SCREENING OF BIO ACTIVITY OF DIFFERENT PARTS OF A LEGUMINOUS MEDICINAL PLANT IN VARIOUS SOLVENT EXTRACTS

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Abstract:

The present investigation was taken to evaluate the antifungal effect of different parts of P. corylifolia prepared in aqueous and in different solvent extracts. The test fungi used were Fusarium oxysporium and Aspergillus fumigatus. The methanol extract(1000 µl)of leaf showed maximum inhibition against A.fumigatus (26mm) and moderate inhibition against F.oxysporium (23mm). Petroleum ether extract (1000 µl) of leaf showed maximum inhibition against F.oxysporium (22mm) than A.fumigatus (17mm).In aqueous extract 50% aqueous extract of leaf showed higher affectivity i.e.(20mm &19mm) against F.oxysporium & A.fumigatus respectively than tender stem extract. It was identified during study that Petroleum ether and methanol extracts of leaf of P. corylifolia is a potent solvent showed highest antifungal activity. The aqueous extract of leaf also showed high antifungal activity at 50% conc. against test fungal strains.

Keywords:

Psoralea corylifolia, solvent extracts, antifungal activity,Aqueous

Introduction:

In recent years, several diseases and microbial infections, have shown considerable resistance to a number of antimicrobial agents, such as penicillin, ampicillin, and flouroquinolones among many others(Okeke, et al.,2007)There is an increasing trend in the emergence of resistance to antimicrobial agents, not only due to the poor quality drugs, patient non-compliance, and irrational use of antimicrobial agents, but also to spontaneous mutations within the microbial populations(Ndugulile, et al., 2005). This situation and unknown side effects of certain antibiotics have forced scientists to search for new options as anti microbial substance from various natural sources such as medicinal plants. Medicinal plants represent a rich source of antimicrobial agents (Mahesh and Satish, 2008). Many potent drugs have been purified from

medicinal plants having antirheumatic, antimalarial, anticancer, antidiabetic and antimicrobial properties (Kaushik et al., 2000). Many recent studies have shown that both crude extracts and purified compounds isolated from plants can be effectively used as natural antifungal agents (Kanwal et al., 2010). Plant based antimicrobials which include antibacterial and antifungal effects represent a vast untapped source of medicines and they provide enormous therapeutic potential. A systemic screening of traditional medicines may result the discovery of novel effective compounds. The need of the hour is to screen a number of medicinal plants for promising biological activity (Chanda et al., 2011). According to WHO reports, about 80% of world population is taking interest in indigenous medicinal plant remedies (Pirzada et al., 2009).

P.corylifolia linn. Commonly known as babchi, belonging to family leguminosae, distributed widely in a tropical and subtropical region.The plant has been used in indian & chinese folk, siddha & Ayurvedic Medicine. P. corilifolia exhibiting antitumour, antibacterial, antimycotic, antioxidant activities used in curing many diseases. Despite the wide range of medicinal use of P. corilifolia, the plant has not received much attention and has not been fully studied. Therefore, the present work has been taken up to investigate the antifungal activity of aqueous and solvent extracts of leaves and tender stem of

P.corylifolia L. against some harmful fungi. The systematic study of higher plants for detecting antimicrobial activity is of comparatively recent origin (Indumathy et al., 2011).

Material and Method:

Plant materials: Leaves and tender stem of Psoralea corylifolia were obtained from the plants grown in the college garden. Seeds were purchased from the local medicinal plant agency in Nagpur city. Leaves, tender stem were washed, air dried and then powdered in mixer grinder and stored in air tight bottles. Preparation of aqueous extracts: 100 grams of thoroughly washed and air dried plant parts of Psoralea corylifolia were macerated with 100ml of sterile distilled

water for 5 minutes. The macerate was filtered and centrifuged at 2000rpm 50 minutes. The supernatant was filtered through Whattman filter paper No.1and sterilized at 120oC for 10 minutes. The extracts were stored in brown bottle aseptically at 5oC for further use. Preparation of solvent extracts: Solvent extraction was prepared by taking 25grams of powder in 200ml of solvent in a conical flask. For best extraction, a soxhlet extractor was used for 48 hours. After this, extracts was concentrated through rotator evaporator which was then stored at 4oC (Chanda, et al., 2011). Test organisms: Two different species of fungi, used during the study were collected from Rajiv Gandhi Institute of Biotechnology, RTM, Nagpur Univ. The test fungi were Fusarium oxysporium and Aspergillus fumigatus. Determination of antifungal activity of Psoralea corylifolia: The antifungal activities of different solvent extracts were determined by Disc diffusion method in Muller Hinton Agar in terms of diameter of zone of inhibition (Bakeht, et al., 2011). The test fungal strains (200µl) were inoculated onto the media and sterile discs (7mm in diameter) soaked in various concs viz; 10,20,30,40 and 50% of aqueous extracts and 250µl, 500 µl, 750 µl, 1000 µl concs. of petroleum ether and methanol solvent were introduced onto the media and then plates were incubated for 24 hours at 37oC. Fungal growth was observed by measuring the diameter of zone of inhibition.(Kiran et al., 2011)

Result and Discussion:

In the present investigation, the maximum inhibition is recorded in terms of zone of inhibition (mm) by disc diffusion method (Bauer et al., 1966). In between the two fungi tested, at different concentration (10%, 20%, 30%, 40% and 50%) of aqueous extract prepared from leaf and tender stem of P. corylifolia, F. oxysporium recorded the maximum inhibition (20mm) in 50% aqueous extract of Leaf (Fig:3) in comparison to tender stem i.e. 18mm (Fig:1) followed by A.fumigatus (19mm) (Fig:5) with 50% aqueous extract of leaf & 17mm with 50% tender stem extract (Table 1, 2). In the solvent extracts with

different concentrations of Methanol and Petroleum ether prepared by taking leaf and tender stem as potent testing part of P.corylifolia, Methanol extract of Leaf at 1000µl showed maximum inhibition (26mm) against A.fumigatus (Fig: 4) followed by F.oxysporium (23mm) (Fig:2) (Table 3) whereas Petroleum ether showed moderate effect i.e. 17mm with A.fumigatus and 22mm with F.oxysporium. Methanol extract of tender stem at 1000µl showed maximum inhibition 18mm against F.oxysporium and 17mm against A.fumigatus as compared to petroleum ether extract i.e. 15mm & 16mm against F.oxysporium &, A.fumigatus respectively (Table 4). The result predicted that methanol and petroleum ether extract of leaf is a potent solvent which showed highest antifungal activity. The aqueous extract of leaf also showed high antifungal activity at 50% conc. against test fungal strains. Kiran et al., 2011 used aqueous and solvent extracts of seeds of Psoralea corylifolia against five test fungi to evaluate its effect. Hosmani et al., 2012, showed antimicrobial property of leaf parts of P. corylifolia using different solvent extracts. The antimicrobial activity of the leaf extracts, however, is because of its essential oil content (Nakamura et al, 1999; Usha et al, 2010; Hosamani et al, 2011). The present investigation indicate that, P.corylifolia (leaf) is a potent medicinal plant which showed strong bioactivity against harmful and disease causing fungi in both solvent extracts (methanol and petroleum ether) as well as in high conc. of aqueous extract.

Conclusion:

The present investigation indicate that, P.corylifolia (leaf) is a potent medicinal plant which showed strong bioactivity against harmful and disease causing fungi in both solvent extracts (methanol and petroleum ether) as well as in high conc. of aqueous extract.

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Table no.1: Maximum inhibition in different concentrations of aqueous extracts of Leaf

Fungi	Maximum Inhibition(mm)				
	Concentration of aqueous extracts of LEAF				
	10%	20%	30%	40%	50%
Fusarium oxysporium	15mm	16mm	18mm	18mm	20mm
Aspergillus fumigatus	12mm	15mm	18mm	18mm	19mm

Table no.2: Maximum inhibition in different concentrations of aqueous extracts of Tender stem.

Fungi	Maximum Inhibition(mm)				
	Concentration of aqueous extracts of TENDER STEM				
	10%	20%	30%	40%	50%
Fusarium oxysporium	8mm	10mm	12mm	15mm	18mm
Aspergillus fumigatus	8mm	11mm	13mm	15mm	17mm

Table no.3: Maximum inhibition in different concentrations of solvent extracts in Leaf

Fungi	Maximum Inhibition(mm)							
	Concentration of solvent extracts of LEAF							
	Methanol extract(µl)				Petroleum ether extract(µl)			
	250	500	750	1000	250	500	750	1000
Fusarium oxysporium	12mm	15mm	18mm	23mm	8mm	11mm	14mm	22mm
Aspergillus fumigatus	10mm	13mm	15mm	26mm	8mm	10mm	15mm	17mm

Table no.4: Maximum inhibition in different concentrations of solvent extracts in Tender stem.

Fungi	Maximum Inhibition(mm)							
	Concentration of solvent extracts of Tender stem							
	Methanol extract(µl)				Petroleum extract(µl)			
	250	500	750	1000	250	500	750	1000
Fusarium oxysporium	9mm	11mm	14mm	18mm	8mm	10mm	13mm	15mm
Aspergillus fumigatus	8mm	11mm	13mm	17mm	8mm	10mm	15mm	16mm

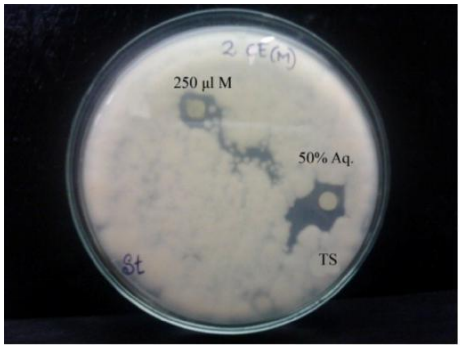

Fig:1*Fusarium oxysporium* (TS) with 50% aq. ext

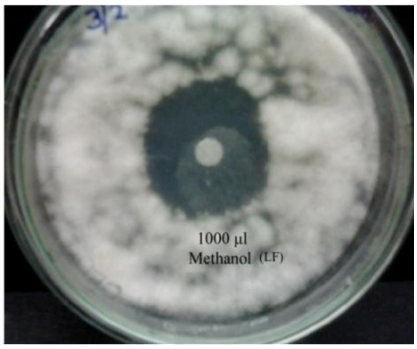

Fig:2 *F. oxysporium* (L): with 1000 µl M ext.

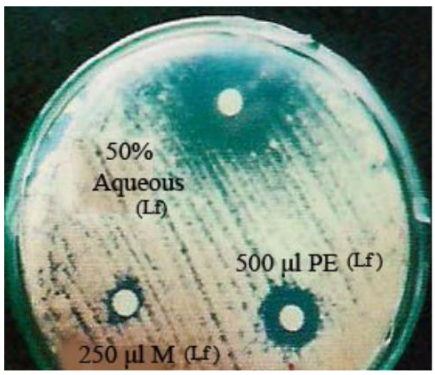

Fig: 3 *F. oxysporium* (L): with 50% aq. ext

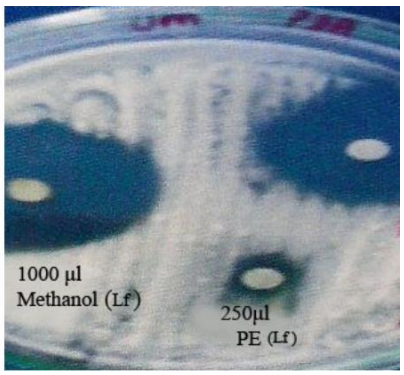

Fig:4 *Aspergillus fumigatus* (L). 1000 µl M.ext and 250 µl PE ext

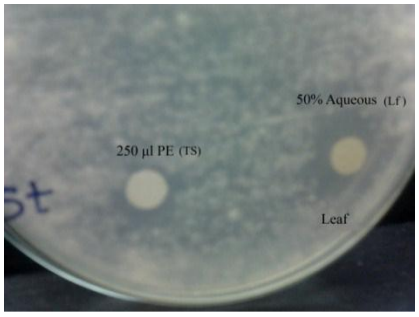

Fig:5 *A.fumigatus* : with 50% aq.ext. (L) and 250 µl PE (TS)

(TS- Tender stem, L-Leaf, M-Methanol, PE-Petroleum ether, Aq- Aqueous)