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RESEARCH ARTICLE

BIOASSAY FRACTIONATION BASED ANTIFUNGAL ASSAY OF STEMS OF *CISSUS QUADRANGULARIS* (LINN.)

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ABSTRACT

Cissus quadrangularis is a herb claimed to be used for the treatment of various diseases by common man. This plant possesses immense medicinal potential and since there are not many scientific studies carried out on the stem parts of this plan, the biological evaluation of the stems was taken up. The ethanol extract of stems of *cissus quadrangularis* was analyzed for its antifungal activity by disc diffusion method. The ethanol extract showed antifungal activity against *Monoscus ruber* comparable to that of standard *clotrimazole.*.

INTRODUCTION

Cissus quadrangularis (*family Vitaceae*) is widely distributed throughout India and is a widespread evergreen plant commonly found in tropical and subtropical area.It is a fleshycactus-like liana widely used as a common food item in india.The plant is prescribed in the ancient ayurvedic literature as a general tonic and analgesic, with specific bone fracture healing properties.

The plant is believed to be useful in the treatment of helminthiasis, anorexia,dyspepsia, colic,flatulence, skin diseases, leprosy, hemorrhage, epilepsy, convulsion, haemoptysis, tumors, chronic ulcers, swellings.
The antibacterial potential of various solvent extract of leaf, stem and whole plant of *Cissus quadrangularis* has been analysed. Table 1 lists the details of past work with reference to antibacterial activity.

There is only one report on antifungal activity of the ether and ethanol extracts of leaves (Merinal etal.,2012).The present study is the analysis of antifungal activity of stem extractsof *C.quadrangularis* obtained by sequential extraction and liquid-liquid fractionation.

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MATERIALS AND METHODS

Collection of plant material

The stems of *Cissus quadrangularis* were collected during October-December 2011 in the local areas of Palani, Tamilnadu, India. The identity of the plant material was confirmed by Dr.P.Sathyanarayana Scientist 'D' and Head Botanical Survey of India, Coimbatore. The stems were dried in shade and cut in to small pieces and then used for the study.

Sequential Extraction of Stem

Air dried pieces of stems of *C.quadrangularis* were sequentially extracted with petroleum ether, ethyl acetate and ethanol for 6 hours at reflux temperature. Extracts were concentrated to one tenth volume under reduced pressure and designated as CQSP, CQSEA and CQSE.

Liquid-liquid Extraction (LLE)

The ethanol extract concentrate (CQSE) was macerated with equal volume of water and extracted with chloroform. The organic and aqueous layers were concentrated; designated as CQSC and CQSW1 .The concentrate CQSC was dissolved in 10% aqueous ethanol for further extraction with pet-ether.

Table.1 Reports on Antimicrobial Activity of C.quadrangularis

Plant Part Analyzed	Extract Analyzed	Bacteria Tested	Fungi Tested	Method Adopted	References
Stem	Dicholoromethane Hydromethanol (90%)	1.S.aureus 2.E.coli 3.P.aeruginosa	-	micro dilution assay	Luseba et al.,2007
Leaf	Ethanol Diethyl ether Aqueous	1.E.coli 2.K. pneumonia 3.S.aureus	1.A.flavus 2.C.albicans 3.Fusarium solani	in-vitro agar well diffusion assay	Merinal et al.,2012
Stem	Methanol Ethylacetate n-hexane	1.B.subtilis 2.B.cereus 3.S.aureus 4.S.aureus	-	antimicrobial assay	Chidambara-murthy et al.,2003
Whole plant	n-hexane Choloroform Ethylacetate methanol Water	1.E.coli 2.B.subtilis 3.S.aureus 4.C.albicans 5.S.cerivisiae	-	disc diffusion method	Garima Mishra et al.,2009

Table .2 Antifungal Screening of Stem Extracts of *C.quadrangularis*

Extract code	Zone of Inhibition (mm)				
	Aspergillus niger	Aspergillus fumicates	Monoscus Ruber	Candida	albicans
CQSP	17	8	11	13	
CQSEA	13	11	15	15	
CQSE	14	11	16	17	
CQSC	12	09	10	12	
$CQSW_1$	11	09	09	10	
CQSP	11	09	10	08	
$CQSW_2$	07	14	10	08	
Standard*	12	12	12	16	

* Clotrimazole 10µg/disc mm

The LLE with pet-ether was continued until the organic layer was colourless. The organic and aqueous layers were concentrated under vacuum and the concentrates designated as CQSP1 and CQSW2.

The extract concentrates CQSP,CQEA, CQSE,CQSC,CQSW1,CQSW2 and CQSP1 were analyzed for their antifungal efficacy.

Anti fungal Assay

Antifungal assay was done by disc diffusion method. Species culture was grown on Sabouarud's dextrose agar (www.microbelibrary.org) at 28°C and each sample-impregnated disc was placed on the agar and incubated at 28°C for 48 h. The clear zone inhibition was measured.

RESULTS AND DISCUSSION

Antifungal screening results for the various extracts are given in Table 2.The ethanol extract (CQSE) and the various fractionates showed varying degrees of inhibition against all the fungal strains. The pet-ether and ethanol extract exhibit anti-fungal activity against Monoscus *ruber* higher than that of standard clotrimazole. This study revealed the potentially active fractions from which the active principles could be isolated.

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