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Research Article

Antifungal activity of stem bark of *Helicteres isora* Linn.

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ABSTRACT

The effect of petroleum ether and methanol extract of stem bark of *Helicteres isora* was investigated in five different fungus i.e. *Cryptococcus neoformans, Candida tropicalis, Trychophyton rubrum, Microsporum furfure, Epidermophyton floccosum* to evaluate the antifungal activity. For this evaluation Sabouraud's glucose broth media was used. All the two extracts exhibited antifungal activity. The methanol extracts showed significant antifungal activity; where as the petroleum ether extract showed weak antifungal activity.

Keywords: Antifungal activity, *Helicteres isora*, minimal inhibitory concentration.

INTRODUCTION

Helicteres isora is belongs to family Sterculiacae is a sub-deciduous shrub or small tree of having spreading habit with stem 1-5 inches in diameter, reaching a height of 5-15 feet. The species is native to Asia and Australia [1]. It occurs, throughout India, from Jamuna eastwards to Nepal, Bihar and Bengal and southern India and Andaman Islands. It occurs as undergrowth, especially as a secondary growth in forests.

The literature survey reveal the presence of flavones [2], triterpenoids[3], cucurbitacin[4], phytosterols, saponins, sugars and phlobatannins[5].

The root and stem barks are considered to be expectorant, demulcent, astringent and anti-galactagogue and are useful in colic, scabies, empyema, gastropathy, diabetes, diarrhea and dysentery[6].

The fruits are astringent, acrid, refrigerant, demulcent, constipating, stomachic, vermifuge, vulnerary, haemostatic and urinary astringent. They are useful in vitiated conditions of pitta ophthalmitis, colic, flatulence, diarrhea, dysentery, verminosis, wounds, ulcers, hemorrhages, epistaxis and diabetes[6].

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MATERIALS AND METHODS:

Plant material

The stem barks were collected from Nashik (MS) and authenticated by a botanist from Botany department of K.T.H.M.college, Nashik., Maharashtra, India.The stem barks were shed dried, ground and sieved with a 40 mesh sieve.

Preparation of extracts.

About 2 kg of stem bark powder was subjected to hot extraction using soxhlet extractor, successively with petroleum ether, chloroform and methanol. All the extracts were concentrated under reduce pressure by using rotary flash vacuum evaporator and then dried by using vacuum dryer, giving PEH (0. 25%), CEH (0.83%), and MEH (3.10%) respectively.

Test microorganisms

Fungal Strains were obtained from National Chemical Laboratories (NCL), Pune, Maharashtra. *Cryptococcus neoformans* NCIM 3471, *candida tropicalis* NCIM 545, *Epidermophyton flocosum* NCIM 1099, *Trichoderma rubrum* NCIM 1221 and *Microsporum furfure* NCIM 1197 were used as test organisms.

Determination of anti-fungal activity:

Anti-fungal activity of the extracts against *Cryptococcus neoformans, Candida tropicalis, Trychophyton rubrum, Microsporum*

Table 1. Minimum Inhibitory concentration (μg/ml) of *Helicteres isora* stem bark extracts by tube dilution method

Name of Fungus	Petroleum ether extract (μg/ml)	Methanolic extract (μg/ml)	Salicylic Acid (μg/ml)
1.Cryptococcus neoformans	0.625	0.625	0.625
2.Candida tropicalis	1.25	0.625	1.25
3.Trychophyton rubrum	2.5	1.25	0.625
4.Microsporum furfure	1.25	0.625	1.25
5.Epidermophyton floccosum	1.25	1.25	0.625

Values are Minimal Inhibitory Concentration (μg/ml) , and an average of triplicate.Standard Drugs: Ketoconazole.Incubation conditions for bacteria—1 day at 37⁰ C. For fungi—7 days at 27⁰ C.

furfure, Epidermophyton floccosum were performed by using Sabouraud's glucose broth as media for assay. The inoculated tubes were incubated at 37 ^{0}C for 48 hours.

Preparation of Sabouraud's glucose broth:

Glucose and peptone were dissolved in distilled water with aid of heating. Then the medium was cooled and filtered, pH was adjusted to 5.4 with 10% lactic acid. The media was sterilized by autoclaving at 15-lb/Psi pressure for 15 minutes. One ml of sterilized media was poured into sterilized test tubes.The stock solution of petroleum ether and methanol extract having concentration 10 μg/ml were used. The extracts were serially diluted to give a concentration of 5, 2.5, 1.25, 0.625, 0.312 and 0.156 μg/ml. In all the tubes 0.1 ml of suspension of bacteria in saline was added and the tubes were incubated at 37 ^{0}C for 24 hours. The growth in the tube was observed visually for turbidity and inhibition was determined by the absence of growth. MIC was determined by the lowest concentration of sample that prevented the development of turbidity. The procedure was performed for five fungal species for two extracts. The procedure was repeated to confirm the MIC. The salicylic acid was used as standard.

RESULT AND DISCUSSION:

The stem-bark of *H.isora* possesses antifungal activity. All the two extracts exhibited antifungal activity. The methanol extract showed significant antifungal activity; where as the petroleum ether extract showed weak antifungal activity.Thus the methanol extract was more potent compared to petroleum ether extract.

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