

ANTI-FUNGAL ACTIVITY OF LEAF EXTRACT OF *DERRIS INDICA*

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ABSTRACT: The extraction of the leaf of *Derris indica*, family Fabaceae was carried out using petroleum ether and chloroform in succession. The petroleum ether and chloroform extracts showed the presence of phytosterols and saponins. The chloroform and ethanolic extracts showed the flavonoids and fixed oils the ethanolic and aqueous extracts showed the presence of carbohydrates. The extracts were evaluated for anti-fungal activity. The chloroform extract showed significant anti-fungal activity.

Key words: *Derris indica*, Leaf extract, Antifungal activity

INTRODUCTION

*Derris indica*⁹, a plant belonging to family Fabaceae is an erect perennial tree. Although it grows widely throughout the tropics, it can be found at higher elevations. The tree is frequently found in pastures, waste lands, cultivated lands, roadsides, lawns and in planted forests. In India and Nepal it is found throughout the hotter parts and also worldwide. The plant is used for the treatment of many diseases such as the fruits and sprouts are used in folk remedies for abdominal tumors in India. In India seeds were used for skin ailments. Today the oil is used as a liniment for rheumatism. Leaves are active against micrococcus. The juice of the leaf is used for cold, cough, diarrhoea, dyspepsia, flatulence, gonorrhoea & leprosy. Roots are used for cleaning gums, teeth and ulcers. Bark is used internally for bleeding piles. Juices of the leaf as well as oils are used as antiseptic. It is said to be an excellent remedy for itch, herpes, etc. Powders of the seeds are valued as tonic, for treatment of bronchitis and whooping cough. Flowers are used for treatment of diabetes. Bark has been used for beriberi. According to ayurvedic medicine the root and bark has anthelmintic activity, used in the diseases of eye, skin & vagina, itch, piles, splenomegaly tumors, etc⁴. Reported phytoconstituents include the petroleum ether extracts of fresh leaves of *Pongamia glabra* yield a new furano flavone 3'-methoxy pongapin⁷. 3-methoxypongapin, 8-methoxyfurano-(4'',5'':6,7)-flavones and earlier flavones and koradji have been isolated from the leaves of *Pongamia glabra*. Glabrachalcone, a new chromenochalcone have been isolated along with a known chromenochalcone from ethanol extracts of the seed oil of *Pongamia glabra*. Many pharmacological activities viz. anti-malarial activity of the methanol extracts of the bark of *Pongamia glabra*³, antibacterial activity of the seed oil⁵, and wound healings activity of the aqueous extract⁸ of the plant *Pongamia glabra* have been reported earlier. However detailed investigation of the anti-fungal activity of it has not been carried out.

MATERIAL AND METHODS

Plant Material:

The disease free fresh plant material (Leaf) were collected in the month of September 2008 from Ganjam district of Orissa and authenticated at Botanical Survey of India, Shibpur, Howrah, West Bengal. After authentication, fresh leaves were collected in bulk from the tree, shade dried, pulverized and passed through sieve no.40 to obtain coarse powder.

Preparation of the Extract:

The powder bark (800 gm.) were subjected to continuous hot successive extraction with petroleum ether, chloroform followed by concentrating each extract under vacuum. (Yield: Petroleum ether – 1.87%, Chloroform – 3.00%) with respect to the dried powder plant material (leaf). The extracts were used for the study of anti-fungal activity.

Phytochemical Studies:

The petroleum ether and chloroform extracts showed the presence of phytosterols and saponins. The chloroform and ethanolic extracts showed the flavonoids and fixed oils the ethanolic and aqueous extracts showed the presence of carbohydrates.

Anti-fungal Activity:

Anti-bacterial studies were carried out by paper disc method for the petroleum ether extract and chloroform extract of the leaf of *Derris indica* against *Aspergillus niger* and *Candida albican*. After preparing the medium agar was dissolved and distributed to boiling tubes in 20ml quantities and sterilized in autoclave. The medium was inoculated with 0.5ml suspension of 48hrs culture test organism. The organism was sub cultured 2 days before the test was carried and the vegetative forms of the organism was used in the test. The agar medium was poured in petridishes that are previously sterilized then they were allowed to set at room temperature for 30min into uniform thickness. The zone of inhibition in millimeters was recorded and compared with the standard drug Griesofulvin of 100µg/ml concentration. From the stock, subculture was prepared for each organisms. The test solutions were prepared by dissolving the petroleum ether extract and chloroform extract of the leaf in dimethyl formamide to obtain S₁ (1mg/ml), S₂ (5mg/ml), S₃ (10mg/ml) concentrations. In the petridishes nutrient agar media were spreaded along with the organisms (pour plate technique) followed by placing the paper discs (6mm diameter) soaked with test and standard solutions aseptically and then followed for 24 hours incubation at 37±0.5°C to note down the zone of inhibition¹. The average results of triplicate along with mean ± standard error value are presented in the table.^{2,6}

RESULTS AND DISCUSSION

Significant anti-fungal activity was found against *Aspergillus niger* and *Candida albican* by the petroleum ether extract and chloroform extract of the leaf of *Derris indica* were described in the tables (Table 1 & Table 2). The chemical constituents which are present in the petroleum ether extract and chloroform extract of the leaf of *Derris indica* are good antibacterial agents and are so effective against *Aspergillus niger* and *Candida albican*.

TABLE- 1 : Anti fungal activity of Chloroform extract of *Derris indica*

Test Organisms	Griseofulvin 100µg/ml	Concentrations of Chloroform Extract			Control DMF
		200µ/ml	400 µg /ml	1mg/ml	
A.niger	20.54±0.47	12.53±0.15	17.81±0.53	20.43±0.24	6.35±0.13
C.albican	18.32±0.65	11.12±0.19	14.83±0.42	17.84±0.29	6.35±0.13

TABLE- 2 : Anti fungal activity of Petroleum ether extract of *Derris indica*

Test Organisms	Griseofulvin 100µg/ml	Concentrations of Petroleum Ether Extract			Control DMF
		200µ/ml	400 µg /ml	1mg/ml	
A.niger	20.56±0.47	10.42±0.22	12.55±0.62	18.87±0.47	6.35±0.13
C.albican	18.32±0.65	9.22±0.12	11.58±0.31	16.25±0.27	6.35±0.13

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