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ANTI-DERMATOPHYTIC ACTIVITY OF *PASSIFLORA FOETIDA* L: AN EXOTIC PLANT

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ABSTRACT

Skin infections are common diseases in developing countries, of which dermatophytoses are of particular concern in the tropics, especially in infants. This study was aimed to test *in vitro* antifungal activity of certain dematophytes by the leaf and fruit extracts of *Passiflora foetida* L. were tested for against three fungi such as *Trichophyton rubrum*, *T. mentagrophytes* and a yeast fungus *i.e. Candida albicans*, by agar tube dilution technique. The result showed ethanolic leaf extract exhibited better activity against *T. rubrum* followed by *T. mentagrophytes* and *C. albicans*. The acetone and ethanol fruit extracts contribute least to moderate activity against test fungi. The results concluded this plant may pave the way to treatment of dermatomucosal and skin infections.

Key words: *Passiflora foetida*, Anti-dermatophytic activity, organic solvents, *cutaneous pathogens*.

INTRODUCTION

Medicinal plants and herbs are known to ancient modern civilization for their healing properties. Until, the development of chemistry, particularly of the synthesis of organic compounds in the 19th century, medicinal plants and herbs where the sole source activity principles capable of cutting man's ailments [1]. A systematic approach through experimental and clinical validation of efficacy is required for a plant identified for traditional medicine, as is done in modern medicine [2].

In India, from ancient times different parts of medicinal plants have been used to cure specific aliments. Today, there is widespread interest in drugs derived from plants. The increasing resistance to antifungal compounds and the reduced number of available drugs led us to search therapeutic alternatives among aromatic plants and their essential oils, empirically used by antifungal properties [3, 4]. To determine the potential and promote the use of herbal medicine, it is essential to intensify the study of medicinal plants that find place in folklore [5, 6]. This study is focus to the antifungal activity of Passionflower (*Passiflora* speices) is an exotic, common and fast growing perennial vine. The ethnobotanical aspects of *P. foetida*, fruits are edible (ripe), the decoction of leaves and fruits used to treat asthma and biliousness, leaves and decoction is emmenagougue, used in hysteria [7] and leaves paste applied on the head for giddiness and headache [8]. The earlier attempt of this plant was showed potent antibacterial activity [9] .In this study was planned to test the antidermatophytic activity of *Passiflora foetida* against *Trichophyton mentagrophytes* (causing chronic infections of skin, nails and scalp), *T.rubrum* (produce inflammatory skin or scalp lesions particularly in rural workers) and *Candida albicans* (cause candidiasis).

MATERIALS AND METHODS

Plant collection and Extract preparation

The leaves and fruits of *Passiflora foetida* L. (passion fruit) were collected from the roadside thickets and riverbeds of Rasipuram Taluk, Namakkal, Tamil Nadu. The botanical name was duly identified by using standard floras and shade dried for 10 days. The dried plant materials were crushed and powdered (using mixture) into fine particles. The powdered materials (each 25 grams) were separately extracted with ethanol and acetone solvents (100 ml) and kept into room temperature, for 7 days to allow extraction of compounds from plants. Each mixture was stirred every 24 hours using sterile glass rod. The greenish extracts were obtained and passed through the Whatmann filter paper No 1 and respective solvents were evaporated (at 40ºC). The sticky black substances (1/10 volume of total extracts) were obtained and stored in refrigerator, suspended/ dissolved in DMSO (Dimethyl Sulfoxide) prior to use. The most important and predominant disease causing pathogenic dermatophytes

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like *Trichophyton mentagrophytes*, *T.rubrum* and *Candida albicans* are used in this investigation. The cultures are produced from Microbial Type Culture collection (MTCC), IMTECH, Chandigargh, India.

Studies on Antifungal Activity

Antifungal activity of the plant materials was done by agar tube dilution method [10] with minor modifications. The test tubes having sterile Sabouraud Dextrose Agar (SDA) were inoculated with test extracts 100 and 200 µl/ml) respectively. Each tube was in a slanting position at room temperature. The test fungal culture was inoculated on the slant and incubated at 27 ± 1ºC for 7 days, for observation of mycelia growth on the surface of the medium. The results were recorded after seven days of inoculation and determined by proliferation of fungal growth on exposed surface on slants and categorized into three levels viz.., trace growth (++), normal growth (+++) and maximum growth (++++) [11].

Table 1: Antidermatophytic properties of Leaf and fruit Extracts of *Passiflora foetida* L.

S. NO	Parts Used	Extracts	Conc. Of Extract (µl/ml)	FUNGI TESTED		
				T.menta grophytes	***T.rubrum***	***Candida albicans***
1	**Leaf**	Ethanol	100	+++	+++	+++
			200	++	++	+++
			Control	++++	++++	++++
		Acetone	100	++	++	+++
			200	++	++	+++
			Control	++++	++++	++++
2	**Fruits**	Ethanol	100	+++	+++	++
			200	+++	+++	++
			Control	++++	++++	++++
		Acetone	100	+++	+++	+++
			200	++	++	++
			Control	++++	++++	++++

Trace growth (++), normal growth (+++) and maximum growth (++++)

RESULTS AND DISCUSSIONS

The results of antifungal activities of organic solvent extracts (acetone and ethanol) of leaf and fruits of *Passiflora foetida* are presented [Table 1]. The result observed that plant and their solvents exhibited better inhibition to increasing concentrations of the extract. The ethanolic leaf extract of *P. foetida* showed good inhibition against *T. rubrum* followed by *T. mentagrophytes* and *C. albicans*, where as the acetone extract exhibited moderate activity against test fungi. The ethonal and acetone fruit extracts of *P. foetida*, showed slight antifungal activity against *T. mentagrophytes*, *T.rubrum* and *C.albicans*. The maximum growth inhibition was observed in acetone extract followed by ethanol extract. For *C. albicans*, all these extracts were exhibited least antifungal activity.

Dermatophytes belonging to three genera, *Trichophyton, Microsporum* and *Epidermophyton* and the yeast like fungus *Candida albicans*, affect the keratinized tissues in humans and other vertebrates causing superficial infections confirmed to the skin, hair, nails and mucous membrane [12]. The present research was focused on the antidermatophytic activity of herbal extracts against three important pathogenic fungal strains, and its showed valuable activity/result, while increasing concentration of the extracts. Similiarly, the ethanol extracts of *Mitracarpus villosus* produced definte antifungal activities against several fungi includes *Trichophyton rubrum* and *Candida albicans*, indicate that the extracts were fungistatic at lower concentrations and fungicidal at higher concentrations [13]. Authors like Nicolls [14] described at the antifungal activity *Passiflora* species viz. *P. caerulea* (passion flower), *p.edulis* (purple passion fruit) and *P.mollissima* (banana passion fruit) showed better inhibition against selected fungi. The antimicrobial substance passicol was obtained from *Passiflora* species and these are tested qualitative against fungal molds [15]. Ali-Shtayeh et al. [16] reported the ethanol and aqueous extracts of twenty Palestinian plants were screened for its anticandidal activity. More recently, several studies have been proved the antidermatophytic properties of aqueous and organic solvent extracts of many medicinal plants against the growth of test dermartophytes including *Trichophyton* species [17-21] and yeast like fungus *Candida albicans* [22,23].Therefore, this study supports the use of medicinal plant extracts, treat dermatomucosal and skin infections caused by test pathogens.

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