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Antifungal activity of hydroalcholic extract of *Cynodon dactylon* against dermatophytes

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ABSTRACT

Plant-derived antifungal agents will always remain as an area of interest for researchers to overcome the issues pertaining to resistance and harmful adverse effects associated with synthetic drugs. *Cynodon dactylon* is a well-known plant that grows wildly and used for the treatment of many diseases like wounds, warts, cramps, measles, and also tumors. This research was done as, to date, no scientific evidence was accessible concerning the antifungal potential of the hydroalcholic extract of the whole plant. In the present work, the antifungal potential of hydroalcholic extract of *Cynodon dactylon* was evaluated against *Trichophyton rubrum, Epidermophyton floccosum,* and *Microsporum gypseum*. The antifungal potential was evaluated by means of the agar well diffusion method. The diameter of the clear inhibition zone around the well was measured. The hydroalcholic extract of *Cynodon dactylon* had promising antifungal potential against all the tested fungal strains. Finally, it can be concluded from the calculated findings that hydroalcholic extract of the whole plant of *Cynodon dactylon* may be considered as a promising antifungal herbal plant and can be exploited as a great herbal resistance-free source for the treatment of various fungal infections

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INTRODUCTION

With the increased number of incidences of chemotherapeutic failure and antibiotic resistance by several synthetic antifungal agents, antifungal evaluation of medicinal and traditional plants has become the area of interest for new researchers. Plant-derived active constituents have an added advantage of being less toxic in comparison to several synthetic agents (Colombo, 1996; Dabur *et al.*, 2008). Also, in accordance with WHO, plant-derived drugs have served as a primary healthcare need for an estimate of ~80% of the world population (Arumugam *et al.*, 2014).

Cynodon dactylon (L) belonging to *the Poaceae* family is one of the most commonly occurring wildly growing weeds, which are hardy, perennial, creepy grass finding a wide distribution around the globe particularly in tropical areas and warm temperature. *Cynodon dactylon* is also known as arugampullu (Tamil), garikoihallu (Kanarese), haritali (Sanskrit), durua (Marathi), garikagoddi (Telugu), durba (Bengali), and dhubkhabbal (Punjabi) in various regional languages. The weed is fast-growing, drought-resistant, very tough, and light green with a coarse texture and is found in short cylindri-

cal pieces of 2-4 mm in diameter and 3-20 mm long (Chandel and Kumar, 2015). *Cynodon dactylon* is known for its antiseptic, analgesic, anti-inflammatory, wound healing, astringent, antioxidant, immunomodulatory, ant diabetic, and anticancer activities (Ashokkumar *et al.*, 2013; Kanimozhi *et al.*, 2012). Till date, many researchers in their research had already proved that Butanol, Ethanol, and Methanol extracts of *Cynodon dactylon* leaves showed promising results as potent antifungal agents against a wide range of bacteria (Chaudhari *et al.*, 2011; Singh and Gupta, 2008). The present scenario depicts that no detailed proofs of scientific data are available regarding the therapeutic and medicinal efficiency of hydroalcholic extract of the whole plant of *Cynodon dactylon*. Proofs of herbal drug potential related to the antifungal efficacy of this plant are negligible in the Indian scenario. Therefore, the present research work was carried out to display the antifungal potential of hydroalcholic extract of *Cynodon dactylon .*

MATERIALS AND METHODS

In the present research work, wildly growing common weeds of *Cynodon dactylon*, which was readily available, have been utilized to find out antifungal efficacy against the dreadful keratinophilic fungus namely *Trichophyton rubrum, Epidermophyton floccosum,Microsporum gypseum*. *Cynodon dactylon* wasprocured locally from wild areas of Chandigarh, identified, and proper herbarium sheets are submitted with Pharmacognosy Department, Chandigarh College of Pharmacy-Landran (Mohali). Fungal strain *Trichophyton rubrum* withMTCC no. 3272, *Epidermophyton floccosum* with MTCC no. 7880, *Microsporum gypseum* with MTCC no. 2829 were procured from IMTECH Sector-39, Chandigarh. To extraction procedure was carried out by firstly washing the whole plant material of *Cynodon dactylon*. It was dried in the shade and was pulverized with the help of an electric grinder. 10 grams of powdered form of *Cynodon dactylon* was subjected to maceration for about 48 hours with 60 ml water and 40 ml ethanol (hydroalcholic extract 60:40). Then, filtration of the extract was carried out with the help of filter paper or double-layered muslin cloth. The obtained filtered hydroalcoholic extract was exploited for the evaluation of antifungal potential.

Assessment of antifungal potential

The antifungal activity of hydroalcoholic plant extracts on mycelial growth was studied in the in-vitro condition on Sabouraud Glucose Agar medium (SGA). The culture media was supplemented with appropriate concentrations of hydroalcoholic plant extracts and was poured into the petriplates. These petriplates were inoculated with a mycelial disc of about 5mm diameter from the margins of 8-10 day old colony and raised on SGA. SGA without plant extract served as control. The inoculated plates were finally incubated at a temperature of 28$\pm$20 C for about seven days. The diameter of the colony was measured 7^{th} day.

RESULTS AND DISCUSSION

Antifungal potential of hydroalcholic extract of *Cynodon dactylon* at two different concentrations (1000 μg/ml and 750 μg/ml) was evaluated against *Epidermophyton floccosum, Microsporum gypseum,* and *Trichophyton rubrum.* The antifungal activity of different concentrations of methanol extract of *C. dactylon* is described in Table 1. Figure 1 shows the inhibition zone diameters for different organisms. Two different concentrations of hydroalcholic extracts of *Cynodon dactylon* showed promising results and good efficacy against all the selected fungal strains. At 1000 μg/ml concentration, it exhibits maximum efficacy *Epidermophyton floccosum, Microsporum gypseum* with 19 mm, and 16 mm diameters of zone of inhibition, respectively.

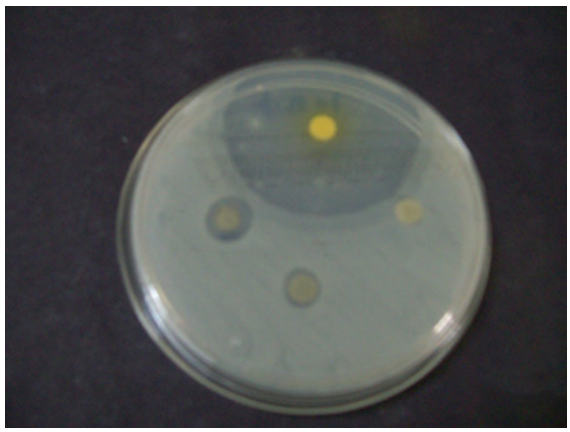

Figure 1: Antifungal activity ofHydroalcholic extract of C. dactylon

In the present study, it was found that hydroalcholic extract of *Cynodon dactylon* at two concentrations of 1000 μg/ml and 750 μg/ml, had showed promising results and good efficacy against all the selected fungal strains but results were very effective against *Epidermophyton floccosum and Microsporum gypseum* at a concentration of 1000 μg/ml. Promising results are due to the presence of active principles such as polar compounds like saponins, which makes it an effective antimicrobial drug (Singh and Gupta, 2008). Previous studies on an ethanol extract of *C. dactylon* have demonstrated antifungal activ-

Table 1: Antifungal activity of Hydroalcoholic extract of C.dactylon with Zone of inhibition in mm

Tested Fungi	Concentration (μg/ml) and Zone of Inhibition (mm) 1000μg/ml	750μg/ml	Antibiotic 1mg/ml (Griseofulvin)	Hydroalcholic Extract
Epidermophyton floccosum	19	12	45	4
Microsporum gypseum	16	15	46	5
Trichophyton rubrum	14	10	44	4

ity attributed due to the presence of triterpenoid saponin (Li *et al.*, 1999). However, after a vigorous and extensive review of literature, the screening for the anti-fungal activity of hydroalcholic extract of *Cynodon dactylon* is still needed to be explored.

The results of our study suggested that hydroalcholic extract of leaves of *Cynodon dactylon* possesses significant antifungal activities. However, it further opens the area of interest for extensive molecular and cellular level investigations for researchers to evaluate the therapeutic effect of phytochemicals present in *Cynodon dactylon* and to identify its mechanism of action, following which it can serve as a valuable therapeutic option for fungal infections.

CONCLUSION

Hydroalcoholic extract of leaves of *Cynodon dactylon* possess significant antifungal activities, particularly against *Trichophyton rubrum, Epidermophyton floccosum, and Microsporum gypseum*respectively and may serve to play a vital role in ethnomedical practice. The activity of *Cynodon dactylon* may be due to the presence of active constituents present in it, which can further be utilized to formulate various formulations against dermatophyte infections.

REFERENCES

Arumugam, N., Boobalan, T., Rajeswari, P. R., Duraimurugan, M. D. 2014. Antimicrobial activity and phytochemical screening of Cynodon dactylon and Carica papaya. *Research in Biotechnology*, 5(5):21–31.

Ashokkumar, K., Selvaraj, K., Muthukrishnan, S. 2013. Review Cynodon dactylon (L.)Pers.: An updated review of its phytochemistry and pharmacology. *Journal of Medicinal Plant Research*, 7:3477–3483.

Chandel, E., Kumar, B. 2015. Antimicrobial activity and phytochemical analysis of Cynodon dactylon: A review. *World Journal Pharmaceutical Sciences*, 4(11).

Chaudhari, Y., Acharya, V., Mody, H. 2011. Antibacterial activity of cyanodon dactylon on different bacterial pathogens isolated from clinical samples. *International Journal of Pharmaceutical Studies and Research*, 2(1):16–20.

Colombo, M. 1996. Pharmacological activities ofchelidonium majusl. (papaveraceae). *Pharmacological Research*, 33(2):127–134.

Dabur, R., Gupta, A., Mandal, T., Singh, D., Bajpai, V., Gurav, A., Lavekar, G. 2008. Antimicrobial Activity Of Some Indian Medicinal Plants. *African Journal of Traditional, Complementary, and Alternative Medicines*, 4(3):313–313.

Kanimozhi, D., Ratha, V., Niger, A., Author, C. A. 2012. Evaluation of Anti Microbial Activity of Cynodon dactylon. *IJRPS*, 2(2):34–43.

Li, X. C., Elsohly, H. N., Nimrod, A. C., Clark, A. M. 1999. Antifungal jujubogenin saponins from Colubrina retusa. *Journal of Natural Products*, 62(5):674–677.

Singh, R., Gupta, A. 2008. Antimicrobial and antitumor activity of the fractionated extracts of Kalimusli (Curculigo orchioides). *International Journal of Green Pharmacy*, 2(1):34–36.