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Antifungal Activity of Camel Faeces on Fungi with Special Reference to *Dermatophytes*

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ABSTRACT

The present study aimed to evaluate antifungal activity of camel faeces (CF) on some pathogenic fungi using water, organic extracts of CF, crude and ash. Agar well diffusion and incorporated methods were used for screening activity of *Candida albicans* and other fungi respectively. Parallel experiments were conducted with ketoconazole and nystatin, as positive control whereas; the vehicle solvents were used as negative control. Phytochemical analysis of Camel feaces was carried out following Harborne method. The obtained results revealed high antifungal activity of CF against tested fungi. Aqueus and ethanol extracts exerted significant effect on dermatophytes followed by chloroform and hexane extracts compared to the ash which revealed no activity. *Aspergillus* and *pencillium* species were found insensitive to all test extracts where as *Candida albicans* was found sensitive only to the hexane extract. Sterols and triterpenes were revealed on phytochemical analysis. The antifungal activity of camel faeces might be due to the sterols and triterpenes. Thus, identification and characterization of novel molecules are highly recommended. The study revealed first report on the use of camel faeces to treat some fungal infections.

Keywords: Antifungal, Camel faeces extract, Dermatophytes, Triterpenes.

INTRODUCTION

Bedouin use camels for transportation in the desert and production of meat, milk, hair or hide (Fassi-Fehri., 1987). The pharmacological effect of urine was previously investigated (Salwa *et al.*, 2006). Camel urine was mixed with milk to treat enteric disordesr (Ohaj, 1998). It was also, found efficacious against ringworm, abscesses and burns (Bass and William, 1988). The antibacterial activity was screened (Mona, 2003). Camel faeces were traditionally practiced to treat some skin infections. The stool was dried, burnt and topically applied to treat dermatitis. Camel dung is used as fuel for fires in the winter, and sometimes for cooking food. According to available literature, there is no systematic study conducted to show its antimicrobial activity.

MATERIALS AND METHODS

Camel faeces were obtained from Camel Research Station located at

Tamboul city (14.92521 latitude; 33.40819 longitude) Gezira State, central of the Sudan. Clinical isolates of *Aspergillus flavus, A. niger, A. fumigatus, Scopulariopsis brevicaulis, Candida albicans, Penicillium, Tichophyton mentagrophytes, T. rubrum, T.verrucosum* and *T. schoenleinii* were obtained from Mycology department (VRI). Organic and aqueous extracts of CF were obtained (Harbone, 1984). 50, 100, 200 and 300mg/ml of ethanol, hexane, butanol, chloroform and water extract of CF besides ash were screened against selected fungi. Agar-well diffusion (Perez *et al.*, 1990) method was adopted to test *C. albicans* and incorporated method was used for moulds (Miah *et al.*, 1990). Parallel experiments with Ketoconazole, Nystatin, were used as positive control whereas; the vehicle solvents were used as negative control. When good growth in the control groups was observed, after 2-3 weeks, the results were read (Elfadid *et al.*, 2002).

RESULTS

Aspergillus and *pencillium* species exhibited no susceptibility to either extract tested at all concentrations used. *C. albicans* was found less sensitive to the extracts used except the hexane extract. Dermatophyte species showed great sensitivity to water and organic extracts compared to the ash which revealed inactivity. 200mg/ml concentration of all extracts, revealed activity against tested dermatophytes and S. *brevicaulis* represented by reduced diameter of the obtained colonies compared to the developed colonies of the control groups. However, at 300mg/ml complete inhibition of growth was obtained (Figures 1&2). All vehicle solvents showed growth of fungi except butanol (Figures 3&4). The phytochemical analysis of CF revealed steroids and triterpenes (Table 1).

Figure 1: Growth of *T. schoenleinii* on chloroform extract (left vial) and the control (right) vial after 21 days at 27ºC (300 mg/ml)

Figure 2: Growth of *T. mentagrophytes* on water extract (upper)plate and the control (lower) plate after 21 days at at 27ºC (200 mg/ml)

Figure 3: Growth of ***T. rubrum*** **on** hexane (vehicle) (left plate) compared to the control (right plate) after 21 days at 27ºC (300 mg/ml)

Figure 4: Growth of ***T. mentagrophytes*** on ethanol (vehicle) (left plate)compared to the control(right plate) after 21 days at 27ºC (200 mg/ml

DISCUSSION

Growth of *Aspergillus* and *Penicillum* species on extract- treated plates indicates inactivity of CF. this might be due to endogenous resistance of such fungi. Inhibition of growth of tested dermatophytes indicated high activity of CF against selected species which suggests presence of novel compounds that posse's antifungal activity. All solvents vehicle showed activity to tested fungi except butanol. This finding indicates that, antifungal activity was due to CF rather than the solvent used. Thus efficacy of CF depends on the solvent used for the extraction. This result encourages the use of ethanol, hexane, chloroform and water for extraction of CF.

CONCLUSION

The present study reveals first report on the use of camel faeces against some pathogenic fungi. CF excreted high antifungal activity against tested dermatophytes.

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