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**OCCURRENCE OF MICROSPORUM GYPSEUM IN SOME
EGYPTIAN SOIL INHABITED BY ANIMALS**

BY

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INTRODUCTION

Gordon et al. (1952) were the first to establish definite Proof of the saprophytic existance of *Microsporum gypseum* in soil. In 1953 Ajello recovered the Known dermatophyte *M. gypseum* for, the first time from soil using the hair baiting technique described by Vanbreuseghem (1952). Since then, successful isolation of *M. gypseum* from soil was reported by Zeidberg and Ajello (1954), Durie and Frey (1955), Szothmary and Herpay (1960); Palsson (1968); Morganti et al., (1980) and Kushida (1984). Its presence in samples of Egyptian soil was demonstrated by Refai and Rieth (1964), El-Bahay et al., (1968) and Refai et al.(1984).

Although direct animal to animal or animal to man infection is compratively rare (Keep and Pile, 1965) involvement of *M. gypseum* in causing ringworm among dogs, cats, equines, lions, and camels was reported by Kaplan et al. (1957); Okoshi and Hasegawa (1967); Bohm (1968); Bover and Rush (1975) Carman et al. (1979) and Custem et al. (1985).

Therefore, the present work was carried out to screen soil samples of animal enclosures for *M. gypseum*.

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MATERIAL AND METHODS

Fourty five samples were collected from animal enclosures in Giza and neighbourings (16 from horse yards, 15 from cattle and 14 from sheep habitations). Another fifty four samples were obtained from animal enclosures at Giza zoological Garden. All of them had been collected from the surface of the soil in sterile plastic containers. Sterile Petri-dishes were filled with the soil samples which were then moistened with sterile water and covered with tufts of sterilized horse hair (hair baiting technique). The plates were incubated in a dark place at room temperature and observed for a period of two months.

RESULTS

In a few Petri-dishes growth appeared within the first month on the hair bait and became visible with the naked eye. The growth was in the form of white brownish spots, which later coalesced together forming spider-like appearance (Fig.1). Preliminary microscopical examination of hair revealed the characteristic macroconidia of the genus *Microsporium* (Fig. 2). Small parts of the fungus were inoculated on the surface of sabouraud dextrose agar, in a few days rapidly growing colonies were observed which were flat, smooth in texture, yellowish in colour with brownish pigmentation on the underside (Fig. 3).

Identification of the isolated fungi:

Microscopical examination of culture mounts revealed the characteristic macroconidia of *M. gypseum* (Fig. 4) which are spindle shaped, rough and septated showing 4-5 cells but not over 6. Isolated dermatophytes from 33 out of ninety nine samples examined (33.3%) were identified as *M. gypserum*.



Fig. (1): Gross appearance of M. gypseum
by using the hair baiting technique.

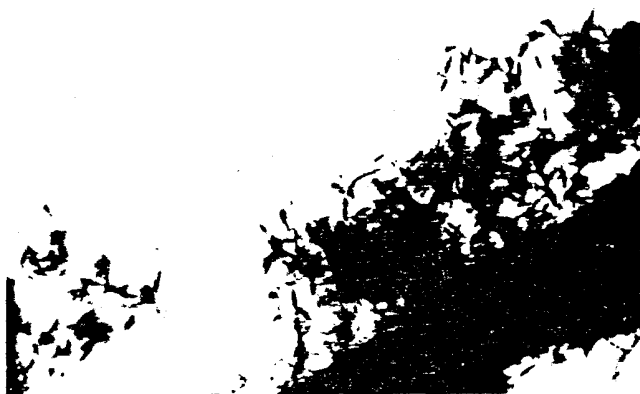


Fig. (2): Close up of Fig.1, showing the mac-

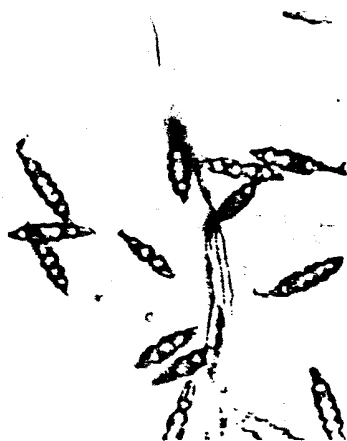


Fig. (3) : Close up of Fig. 2.

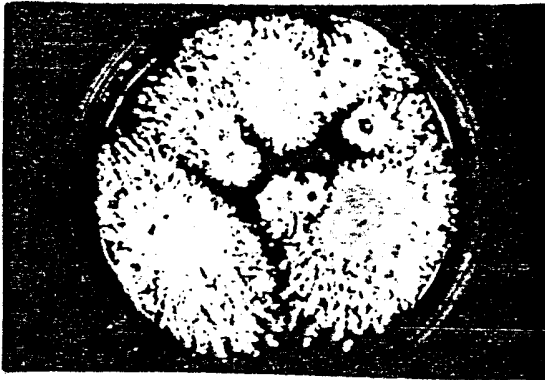


Fig. (4): A culture of *M. gypseum* on SDA.



Fig. (5): Macroconidia of *M. gypseum*
from a culture.

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DISCUSSION

From the results obtained in this work, it is clear that *M. gypseum* could be isolated with a high rate of recovery from soil samples inhabited by ponies, cattle, horses and sheep with a percentage of 46.66, 40, 37.5 and 35.71% respectively. An equal rate of isolation (33.33 percent) was from yards inhabited by Bacterian camels and Grevy's Zebra. The incidence of *M. gypseum* was 25 percent in yards of both tigers and wolf-like Jackals. It is very probable that such soil as rich in keratinaceous debris of animal origin is inhabited frequently by keratinaceous fungi in their saprophytic phase.

Table (1): Prevalence of *M. gypseum* in soil samples collected from different animal enclosures

Place	No. of samples examined	No. of <i>M. gypseum</i> isolates	%
Horse	16	9	37.5
Cattle	15	6	40
Sheep	14	5	35.71
Lions	3	-	
Cheetah	2	-	
Leopard	2	-	
Tigers	4	1	25
Fox	2	-	
Wolf-like Jackal	44	1	25
Wolves	3	-	
Lama	3	-	
Bacterian camels	6	2	33.33
Deer	2	-	
Giraff	2	-	
Pony	15	7	46.66
Grevy's zebra	6	2	33.33
Total	99	33	33.33

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Gordon et al. (1952) were the first to establish the saprophytic existence of *M. gypseum* in the soil, while Zeidberg and Ajello (1954), found that the largest percentage of isolations was from soil samples taken from the vicinity of animal habitations where an increased amount of keratinaceous debris should favour its growth.

From the epidemiological point of view, the dermatophytes are divided into three groups on the basis of their natural habitat: anthropophilic adapted to humans, zoophilic, mostly affecting animals and geophilic, which normally inhabit the soil. *M. gypseum* is considered as geophilic species. Despite most of the geophilic species are regarded less pathogenic as direct animal to animal or animal to man infection is comparatively rare, yet *M. gypseum* is known to infect man, domestic as well as zoo animals especially, horses, small pets, camels and large felines (Trice and Shaffer, 1951, Okoshi and Hasegawa, 1967, Mantovani and Morganiti, 1971, Bover and Rush, 1975 and Petrovich, 1975).

SUMMARY

Ninety nine soil samples were collected from domestic as well as from zoo animals enclosures. *M. gypseum* was recovered from thirty three samples. The high rate of *M. gypseum* isolation was from yards inhabited by ponies, cattle and horses. The role of soil in playing a major part as reservoir of infection to animals was emphasized.

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REFERENCES

1. Ajello, L. (1953): The dermatophyte, *Microsporum gypseum* as a saprophyte and parasite. J. Invest. Derm. 21: 157-171.
2. Bohm, K.H. (1968): Dermatomykosen bei zootieren. KTP, 13 139-141.
3. Bover, W.J. and Rush, D.M. (1975): Veterinary Medicine and Small Animal Clinician, 70: 1190.
4. Carman, M.G., Rush-Munro, F.M. and Carter, M.E. (1979): Dermatophytes isolated from domestic and feral animals. New Zealand Vet. J. 27 (7), 136: 143-144.
5. Custem, J. VAN Keyser, H. DE. Rochette, F., Fales, M, and VAN DER. (1985): Survey of fungi isolated from alopecic and asymptomatic dogs. Vet. Rec. 116 (21), 568-569.
6. Durie, E.B. and Frey, D. (1955): Isolation of *M. gypseum* and *Keratinomyces ajelloi* from Australian soil. Nature, 176, 639.
7. El-Bahay, G.M., Refai, M. and El-Krim, A.M. (1968): Isolation of *M. gypseum* from soil. Vet. Med. J. 15 (16), 189-193.
8. Gordon, M.A., Ajello, L., Georg, L.K. and Zeidberg, L.D. (1952): Saprophytic existence of *Microsporum gypseum* in the soil. Science. 116, 208.
9. Kaplan, W., Hopping, G., and Georg, L.K. (1957): Ringworm in horse caused by dermatophyte *Microsporum gypseum* J. Amer. Vet. Med. Assoc. 131, 329-332.

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10. Keep, J.M., and Pile, C.H. (1965): Canine ringworm due to *Microsporium gypseum*. Aust. Vet. J. 41, 185-187.
11. Kushida, T. (1984): Reisolation of *Microsporium gypseum* and *M. canis* inoculated into soil. J. of Japan. Vet. med. Assoc. 37 (9), 568-571.
12. Mantovani, A. and Morganit, L. (1971): Ricerche sui dermatofiti dei mammiferi in Italia. Veterinaria Italiana. 22, 460-471.
13. Morganti, L., Tegaccia, T., and Turriuni, N. (1980): Research on dermatophytes in dogs and cats of a small town in central Italy. In human and animal mycology. Amsterdam, Netherland, Excerpta Medica. 50, 52.
14. Okoshi, S. and Hasengawa, A. (1967): *Microsporium gypseum* isolated from feline ringworm. Jap. J. Vet. Sci. 29, 195-199.
15. Palsson, G. (1968): Geophilic dermatophytes in the soil in Sweden. Studies on their occurrence and pathogenic properties. Acta. vet. Scand. Suppl. 25, 89.
16. Petrovich, S.V. (1975): Agents of dematomyosis in horses (*Trichophyton equinus*, *T. gypseum* and *Mirosporium equinus*). Veterinaria.
17. Refai. M. and Rieth, H. (1964): Das Vorkommen Von Dermatophyten in Agyptischen Erboden. Zbl. Vet. Med. 11, 200-206.
18. Refai, M. El-Far, F. and Allam, N. (1984): Isolation of dermatophytes, yeasts and moulds from Egyptian soil. J. Egypt. Vet. Ass. 44, 31-37.

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19. Trice, E.R., and Shaffer, J.C. (1951): Occurrence of *Microsporum gypseum* (*M. fulvum*) infections in the district of Columbia area. Arch Dermat. and Syph. 64, 309.
20. Szathmary, S. and Herpay, Z. (1960): Perithecium formation of *M. gypseum* and its cograte, *Epidermatophyton radiosulcatum* Var. *Favum* Szathmary-1940 on soil. Mycopath. et Mycol. Appl. 13, 1-14.
21. Vanbreuseghem, R. (1952): Technique pour L'isolation des dermatophytes du soil. Ann. Soc. Belge Med. Trop. 32, 173-178.
22. Zeidberg, L.D. and Ajello, L. (1954): Environmental factors influencing the occurrence of *Histoplasma capsulatum* and *M. gypseum* in soil. J. Bact. 68, 156-159.