

## The use of nails and skin scrapings for the isolation of dermatophytes from the soil

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In 1964 REFAI and RIETH examined soil samples by the hair-baiting technique described by VANBREUSEGHEM (1952). They reported the isolation of *Trichophyton mentagrophytes*, *Microsporium gypseum*, *M. cookei* and *Monosporium apiospermum*. In the same year the authors could isolate *T. quinckeanum* from soil collected from Giza province. This was the first time to isolate this dermatophyte from soil.

In 1971 REFAI and ABDALLAH used hairs of cows, buffaloes and goats as well as wool of sheep for the isolation of dermatophytes from 45 soil samples. *T. mentagrophytes*, *T. terrestre*, *M. gypseum* and *Chrysosporium* were isolated. The cow hairs gave the largest yield of isolates.

In 1974 REFAI and ADBEL KARIM used feathers of birds in baiting technique and found that feathers were also useful for the isolation of dermatophytes, especially *M. gypseum*, from the soil.

In the present work normal human nails and scales of psoriasis were used for isolation of dermatophytes from soil.

### Material and methods

Pieces of normal nails and scales of psoriasis were sterilized for 20 minutes at 120° C, and were distributed on the

surface of 100 soil samples collected in Petri-dishes from gardens and streets in Heliopolis. The soil samples were moistened with water and incubated at room temperature for one month. The fungi growing on nails or scales were examined both microscopically and culturally. Horse hairs were used also in parallel for comparison.

### Results

50 out of the 100 soil samples yielded dermatophytes, namely, *Trichophyton mentagrophytes* and *Microsporium gypseum*; in 32 samples only moulds were found, namely *Chrysosporium*, *Cephalosporium* and *Monosporium*.

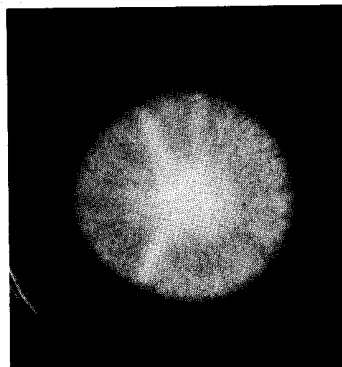


Fig. 1: *Trichophyton mentagrophytes* isolated by nails

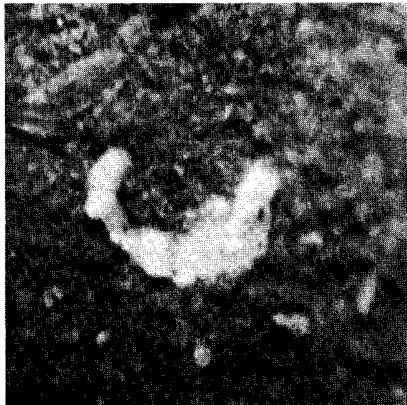


Fig. 2: A piece of nail overgrown by *Trichophyton mentagrophytes*

The scales of psoriasis were unsuitable for isolation of dermatophytes from soil. They were overgrown by rapidly growing moulds e. g. *Rhizopus*, *Mucor* and a greyish white mould consisting of sterile mycelia.

The nails gave good results, but the number of isolates were lesser than that obtained by hairs. All 18 strains isolated by nails were identified as *Trichophyton mentagrophytes* (Fig. 1). The fungal growth appeared at first as small white spots on the nail which then coalesced together and covered the whole nail (Fig. 2). No moulds grew on the nails.

The hairs yielded 21 strains of *T. mentagrophytes*, 29 strains of *M. gypseum* and 32 strains of moulds identified as *Chrysosporium*, *Cephalosporium* and *Monosporium*. In 3 samples *T. mentagrophytes* grew on the nails and *M. gypseum* grew on the hairs in the same plates (Fig. 3 and 4).

In this respect, it is interesting to note that dermatophytes could be isolated from sandy soil on 11 occasions. All isolates were *T. mentagrophytes*.

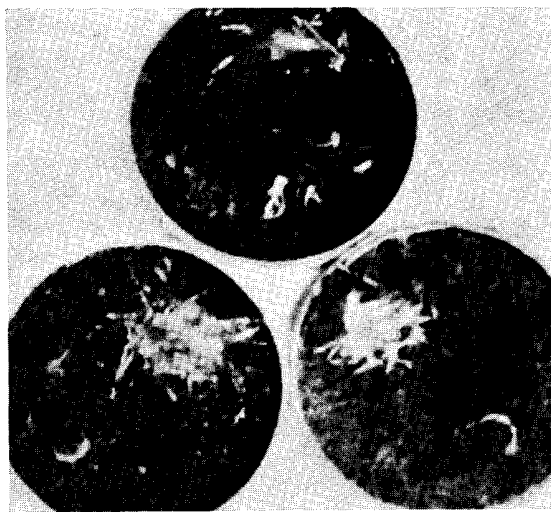


Fig. 3: On the hairs (above) grew *Microsporium gypseum*, on the nails (down) grew *Trichophyton mentagrophytes* in the same plates

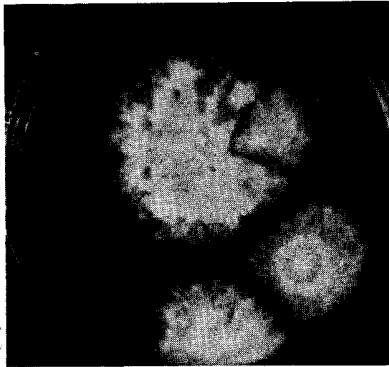


Fig. 4: *Microsporium gypseum* isolated from soil in Heliopolis

### Discussion

It is clear that horse hairs were superior to human nails in the isolation of dermatophytes from soil, however, the nails were not overgrown by moulds, and therefore, they may be helpful in examining highly contaminated soil samples.

In spite of using different materials (hairs, feathers, nails) the authors failed to isolate any of the dermatophytes commonly recovered from man and animals in Egypt, e.g. *T. violaceum*, *T. rubrum* or *M. canis*. This may be due to the absence of these dermatophytes in soil or the unsuitability of these materials for their isolation.

### Summary

100 soil samples collected from gardens and streets in Heliopolis were examined by the nail-baiting technique for the presence of dermatophytes. Scales of psoriasis and horse hairs were used in parallel. The psoriatic scales were found to be unsuitable because they were overgrown by rapidly growing moulds. Nails had limited capacity in the isolation of dermatophytes

from soil. Only *T. mentagrophytes* grew on the nails; no moulds were seen on the nails. On the hairs, beside *T. mentagrophytes* and *M. gypseum*, moulds grew well, especially *Chrysosporium*, *Cephalosporium* and *Monosporium*.

### Zusammenfassung

100 Bodenproben wurden in Gärten und auf den Straßen von Heliopolis gesammelt und mit Hilfe der »Nagelköder-Technik« auf das Vorkommen von Dermatophyten untersucht.

Parallel dazu wurden Hautschuppen von Psoriasis-kranken und Pferdehaare vergleichsweise mitverwendet. Die Psoriasis-schuppen erwiesen sich bei diesem Versuch als ungeeignet, weil sie von schnell wachsenden Schimmelpilzen überwuchert wurden.

Nägel hatten eine begrenzte Fähigkeit bei dem Versuch, Dermatophyten aus Erdboden zu isolieren. Nur *Trichophyton mentagrophytes* wuchs auf den verwendeten Nägeln. Schimmelpilzwachstum war auf den Nägeln nicht zu beobachten.

Auf den Pferdehaaren dagegen wuchsen *Trichophyton mentagrophytes*, *Microsporium gypseum* und Schimmelpilze gut, insbesondere *Chrysosporium*, *Cephalosporium* und *Monosporium*.

### References

1. REFAI, M. and H. RIETH: Zbl. Vet. Med. 11, 200–206 (1964).
2. REFAI, M. and H. RIETH: Mykosen 7, 97–101 (1964).
3. REFAI, M. and I. S. ABDALLAH: Bull. Pharmaceut. Res. Inst. 89/90, 14 (1971).
4. REFAI, M. and M. ABDEL KARIM: (under publication).

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