FUNGAL DISEASES IN SOUTH AFRICA

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In recent years there has been a world-wide increase of interest in medical mycology. Innumerable articles have been written and several text-books have been published. In some of them the information on the incidence of fungal diseases in South Africa is erroneous or misleading. For example, Conant *et al.*[1] do not include this country in the geographical distribution of Benign Histoplasmosis. They report Maduromycosis in Africa but not specifically in South Africa. Langeron [2] has omitted South Africa in the distribution of Torulosis and states that 3 cases of Rhinosporidiosis have been reported from this country.

No fault attaches to the authors. The reason is that after the first report of certain diseases it was thought that no useful purpose would be served by publishing subsequent cases. However, it now appears advisable to publish the incidence of various mycoses in South Africa.

The figures given below are based entirely on the specimens received at this Institute during the past 8 years. This laboratory serves a limited area and the number of specimens handled by other laboratories is unknown to the author. Moreover, the large majority of cases of the dermatomycoses are diagnosed clinically,

and only where the diagnosis is in doubt are specimens sent to the laboratory. Another fact to be borne in mind is that those areas of South Africa which are set aside as Native (Bantu) Reserves possess few medical or laboratory facilities. In one such area it is known on clinical grounds that Favus is extremely common but this is not apparent from an analysis of the figures based on specimens received at the laboratory. The following figures, therefore, do not indicate the total incidence of mycoses in South Africa, nor do they reflect accurately the relative incidence of different mycoses.

DERMATOMYCOSES. All types of dermatomycosis occur in S. Africa but no figures are available on their relative incidence. Any deduction from our specimens would be misleading, since most cases are diagnosed on clinical grounds alone. It is of interest, however, to note the relative frequency of the dermatophytes

TABLE I. DISTRIBUTION OF DERMATOPHYTES ISOLATED AT THE INSTITUTE DURING THE PAST 8 YEARS

	Number	*Percentage*
Microsporum:		
canis	161	73
gypseum	2	1
audouini	5	4·5
Epidermophyton:		
floccosum	11	5
Trichophyton:		
mentagrophytes	16	7
rubrum	1	0·5
violaceum	9	4
schoenleini	9	4
concentricum	1	0·5
discoides	1	0·5
Total	216	100

TABLE II. TOTAL NUMBER OF CASES OF VARIOUS FUNGAL DISEASES DIAGNOSED AT THE INSTITUTE DURING THE PAST 8 YEARS

Otomycosis	19
Sporotrichosis	34
Chromoblastomycosis	41
Maduromycosis	22
Actinomycosis and Nocardiosis	96
Rhinosporidiosis	12
Cryptococcosis	18
Histoplasmosis	2
Pulmonary Aspergillosis	2

encountered on the Witwatersrand. In 221 positive cultures the distribution was as follows: *Microsporum canis* 73%, *Trichophyton mentagrophytes* 7%, *Epidermophyton floccosum* 5%, *Microsporum audouini* 4·5%, *Trichophyton violaceum* 4%, *Trichophyton* (*Achorion*) *schoenleini* 4%, *Microsporum gypseum* 1%, *Trichophyton rubrum* 0·5%, *Trichophyton concentricum* 0·5% and *Trichophyton discoides* 0·5%. The results are summarized in Table I.

A noteworthy feature is the infrequency of *Microsporum audouini* and *Trichophyton rubrum* as compared with their incidence in Great Britain.

Tinea versicolor and Erythrasma are common and Trichomycosis axillaris is occasionally encountered but neither Piedra nor Tinea nigra palmaris has been seen by the author.

OTOMYCOSIS is fairly common (19 cases) and the fungi most frequently found are species of *Aspergillus*, particularly *A. niger*.

SPOROTRICHOSIS. During 1942, 1943 and 1944 an epidemic of over 2,000 cases of Sporotrichosis occurred among gold miners of the Witwatersrand.[3] As a result of chemical treatment of the timber, the disease has practically been eradicated from the mines but sporadic cases still occur, and during the past 8 years 34 cases have been diagnosed at this Institute.

CHROMOBLASTOMYCOSIS. Since Simson [4] reported the first cases of chromoblastomycosis in this country, a further 41 have been encountered. The majority of cases occurred in Bantu subjects and diagnosis was established histologically. In 6 cases from which tissue was submitted for culture the *Hormodendrum pedrosoi* was isolated. In all 6 strains, only hormodendrum and acrotheca types of sporulation were found. No phialophora cups were seen in any of the strains in spite of repeated search on a large variety of media in which various carbohydrates, trace elements and vitamins were incorporated.

MADUROMYCOSIS. 22 cases were diagnosed on histological section. Of these the majority occurred on the foot, 2 on the hand and 1 on the scalp. In a few instances the site was not specified. The *Madurella* was recovered from 3 cases (2 hand, 1 foot) and the *Monosporium apiospermum* from 1 (foot). The remaining cases were not cultured.

ACTINOMYCOSIS AND NOCARDIOSIS. These are the most common of the deeper mycoses; 96 cases were encountered, over 75% of which were in Bantu subjects. In 80 cases in which the anatomical site was known, the distribution was as follows: Skin and subcutaneous tissue 79%, lungs 14%, lymph nodes 4%, joints, liver and ovary 1% each. The diagnosis was established by cultural examination of pus or biopsy specimens in 27 instances. In 57% of these cases the organism responsible was *Actinomyces israeli*, in 35% it was *Nocardia asteroides*, in 4% *N. gypsoides* and in 4% *N. madurae*.

RHINOSPORIDIOSIS. A total of 12 cases was diagnosed. Of these 9 involved the eye (7 Bantu and 2 European) and 3 the nose (1 Bantu and 2 Europeans).

TORULOSIS (CRYPTOCOCCOSIS). In all, 18 cases were diagnosed. Of these 17 presented with meningitis, of which one also had multiple subcutaneous lesions, and one suffered from a lung abscess.

MONILIASIS (CANDIDIASIS). Amongst the conditions caused by this organism, thrush, glossitis, perlèche, erosio interdigitalis blastomycetica, intertrigo, paronychia and vaginitis are frequently encountered. No cases of conjunctivitis, meningitis * or endocarditis due to this organism have been observed.

The incidence of bronchomoniliasis is, as expected, extremely difficult to establish. Although *Candida albicans* is the most common fungus isolated from sputa it was considered in only 2 cases that a diagnosis of bronchomoniliasis was justified.

BLACK HAIRY TONGUE. This condition is fairly

* For a case of cerebrospinal moniliasis at Cape Town, see Emdin, W. and Finlayson, M. H. (1954): S. Afr. Med. J., **28**, 868.

common. Several cases were seen even before the advent of antibiotics.

GEOTRICHOSIS. The *Geotrichum* has been recovered from 95 sputa, but the same difficulty arises in interpreting its significance as in monilia.

HISTOPLASMOSIS. Two cases of the virulent systemic infection were seen during the period under consideration. One presented with ulcers of the tongue and one with ulcers of the epiglottis and palate. Both were fatal.

The true incidence of Benign Histoplasmosis in this country is not yet established. Lurie [5] found 12% positive histoplasmin skin-test reactions in subjects most of whom were members of the staff of this Institute and could therefore have come into direct contact with the fungus. In a control group of 25 subjects in the Serum Laboratory of this Institute housed in a separate building no positive reactions were found. Jackson [6] found only 3 positive reactions in 453 subjects tested. However, Murray [7] while investigating a group of 23 speleologists who had suffered from 'cave disease' found 93% positive reactions. On the other hand a control group of 34 students in the same age-group as the speleologists showed no positive reactions. It seems certain therefore that, however the disease is contracted, Benign Histoplasmosis does occur in this country.

ASPERGILLOSIS. One case of pulmonary Aspergillosis has been found at autopsy and one was proved by bronchial biopsy. Two further cases were suspected from cultural examination of sputa but were not proven.

MUCORMYCOSIS. One case of Mucormycosis of the central nervous system was suspected on a histological section of post-mortem material but, as is usual in such cases, no fresh tissue was available for culture.

The incidence of the various diseases is summarized in Table II.

As yet no cases of North American Blastomycosis, South American Blastomycosis or Coccidioidomycosis have been encountered by the author. In more than 250 subjects selected at random and in several cases of undiagnosed pulmonary disease no positive coccidioidin skin tests were found.

SUMMARY

1. The incidence of various mycoses in South Africa based on the specimens examined at the South African Institute for Medical Research during the past 8 years is given. The results are summarized in Table II

2. The relative frequency of the various dermatophytes is summarized in Table I.

3. No cases of North American Blastomycosis, South American Blastomycosis or Coccidioidomycosis were encountered.

My thanks are due to the heads of the Departments of Pathology and Bacteriology of the Institute for access to their records.

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