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Airborne fungi from some eating places on the University of Lagos, Akoka Campus, Nigeria

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ABSTRACT: The fungal flora of the air in 21 eating places on the University of Lagos Akoka Campus was investigated using culture plate method for a period of six months. No two sites had identical types of fungi. Twenty-six sporulating fungal species were isolated, of which six species were of the genus *Aspergillus*, four species of *Penicillium*, two species of *Curvularia*, and one specie each of *Absidia*, *Alternaria*, *Biopolaris Cladosporium*, *Fusarium*, *Mammaria*, *Nectria*, *Neurospora*, *Paeciliomyces*, *Phoma*, *Rhizopus*, *Trichoderma*, and *Zygorrhyncus*. The five predominant fungi were *Aspergillus fumigatus*, *Aspergillus flavus*, *Curvularia lunata*, *Aspergillus niger* and *Fusarium solani*. Some of these fungi isolatd are known allergens and also could be opportunistic in nature causing diseases in man. Sanitary conditions in the eating places on campus were quite poor, they were neither washed with disinfectant nor fumigated before or during the survey.

Key Words: Air-borne fungi; Food Microbiology; Environmental hygiene.

Introduction

Fungal spores are important component of the airspora. The air serves as a means of dispersal for almost all fungi (Ingold, 1965). The air is abundant of fungal spores although it is not a good medium of growth unlike the soil, water, surfaces of living organisms and non-living materials (Deacon, 1980). Various studies have been carried out in various parts of the world to determine the fungal content of the atmosphere for different reasons. Some workers like Screeramulu (1959), Mabadeje (1981), Kingsley (1985) and Hudson (1986) undertook such studies to find out the frequency of occurence of culturable airborne fuigi particularly fungal allergens in hospital ward, bedroom of asthmatic patient, agricultural farmland and science laboratory. The workers had a probable aim of controlling the disease they cause, since fungi have been established as agents of respiratory allergic disease, for example *Aspergillus flavus* causes Aspergillosis in weak human lungs or respiratory tract (Robbins et al., 1995).

This pa[er is written to document the fungal floral of eating places on the University of Lagos Campus. Also the knowledge of the fungal air spora will help in ascertaining the hygienic situation of the eating places on Campus so that efforts can be geared towards the prevention of fungal allergens in the air spora to make the environment more healthy for living.

Materials and Methods

Twenty-one eating places were chosen for the sampling of air borne fungi in different parts of University of Lagos, Akoka Campus (Fig. 1). Sampling of the sites was done monthly for six months (May-Nov. 1998). The sanitary conditions of these eating places were observed and noted.

One thousand milliliters of potato dextrose agar `PDA' (Oxoid) was prepared and sterilized according to reccomdations of Booths (1971). The PDA was poured into 70 Petridishes. Three PDA plants were exposed at each sampling site for 5 minutes. There was a control plate (3 replicates) which was not exposed. The PDA plates were transported between the laboratory and the exposing sites in sterilized aluminium foil (wrapped round the Petridish).

Exposed plates and control were incubated at room temperature (28 - 31°C) for 3 to 5 days. All fungi growing were numbered and sub-cultured on to PDA plates while the colonies were still discrete and had not run into each other. The pure cultures were stored on PDA slants in 14 ml McCartney bottles in the fridge.

To identify the fungi, light microscopic examination was carried out and also cultural cahracteristics such as colour of the fungl colony, number of days before observing the fungus, number of days taken for the fungus to reach the maximum diameter (9cm) of the petri dish and the texture of growth. The morphological and cultural features of each fungus was compared with description given by Talbot, (1971); Deacon, (1980). Domeschet et al., (1980) and Bryce (1992) for idntification. Some mycologist within the department of botany and Microbiology, University of Lagos were consulted for confirmatory identification of the fungi. The percentage frequency of each fungus was calculated as the number of colonies of the fungus over total number of colonies of fungi from all the sites, throughout the 6 month sampling period.

Results

Table 1 shows the occurence of the fungal species in each of the twenty-one eating places during the 6 months sampling period. A lot of fungal colonies could not be identified because they did not sporulate. These colonies were recorded as sterile fungal colonies. Fungi were isolated in all the exposed PDA plates from all the sites sampled. No fungi was isolated in the control (unexpected PDA plate). Twenty-six fungal species were isolated. No two sites had identical fungal species isolated from them. The genus *Aspergillus* had the highest number of species isolated. The number of species which occured during the sampling was six species of *Aspergillus,* for species of *Penicillium,* two species of *Curvularia,* and one species each of *Absidia, Alternaria, Bipolaris, Cladosporium, Fusarium, Mammaria, Nectria, Neurospora, Paeciliomyces, Phoma Rhizopus, Trichoderma* and *Zygorrhyncus.*

Aspergillus fumigatus, Aspergillus niger and *Fusarium solani* occured in 19 of the 21 sites sampled (Table 1). Some fungi such as *Absidia cyclindrospoioides Mammaria echinobotryoides, Mucor hiemalis, Paeciliomyces farinosa, Phoma eupyrema, trichoderma viride* and *Zygorrhynchus moelleria* were isolated from only one of the 21 sampling sites, though not necessarily the same site. A total number of 1,379 fungal colonies were counted from all the sites during the 6 months sampling period. Jaja Hall buttery exposed PDA plates had the highest number of fungal colonies (217) followed by Henry Carr buttery (175 colonies) while Sharon Restaurant had the least with 25 colonies.

The most frequent sporulating fungus was *Aspergillus fumigatus* (8.31%) followed by *Aspergillus flavus* and *Curvularia lunata* (7.31% each) while the least frequent was *Botrytis maydis* with 0.50% (Fig. 2). The sterile fungal colonies accounted for 4.1% of the fungi isolated.

Discussion

Investigations here reveals that no two environment had identical type of fungal spora, since none of the 21 sites had identical fungal species isolated from them. The presence of the fungi might vary from one sight to the other depending on the availability of their selective host or substrates in such an environment.

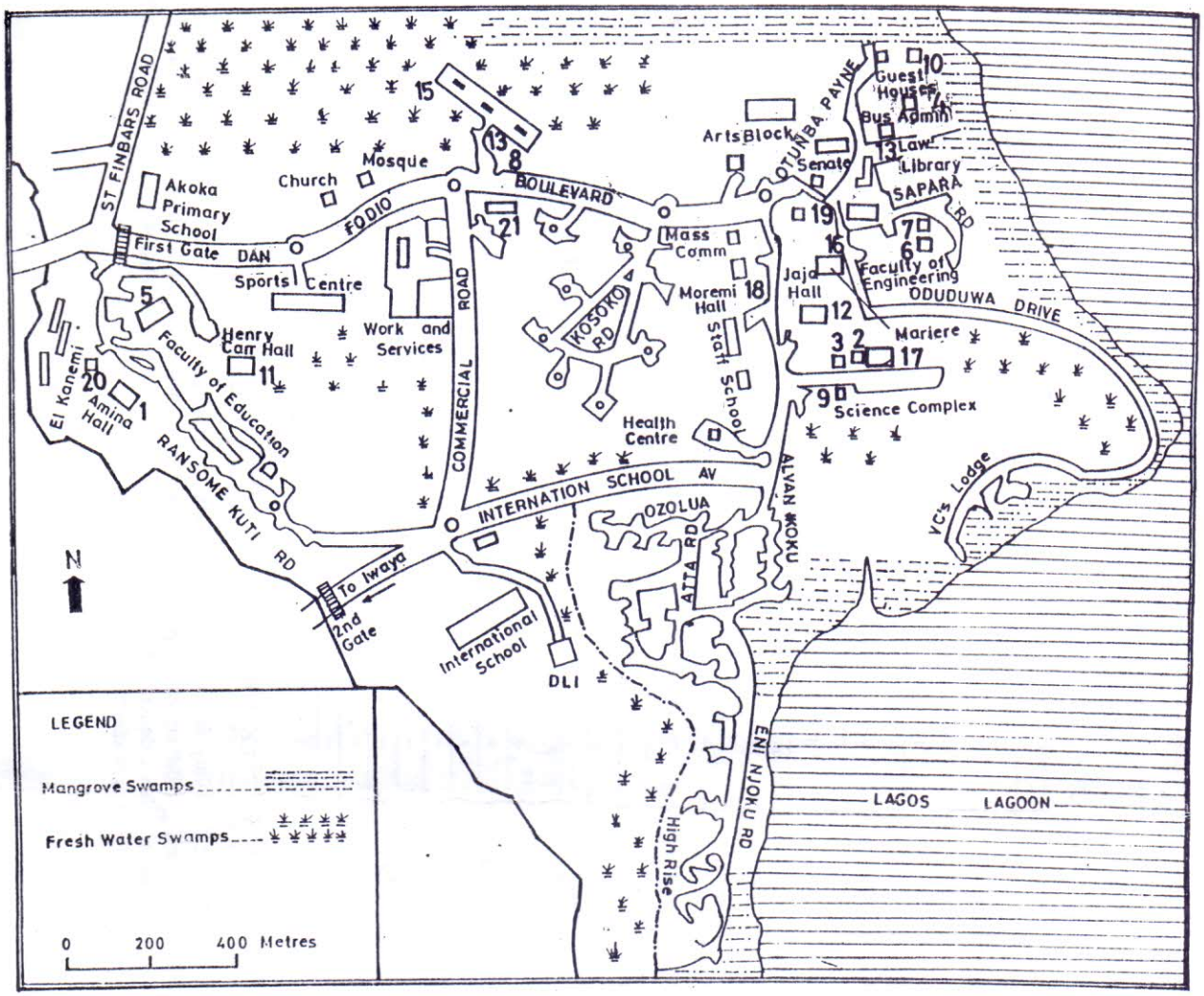

FIG. 1: MAP OF UNIVERSITY OF LAGOS