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Prevalence of Fungi Isolates Inhabiting Hospital Effluent in Southern Nigeria

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Abstract
Fungal populations in hospital effluent have previously been understudied. Here, I evaluated the distribution of fungi isolates in a hospital effluent indiscriminately discharged into the environment in Southern Nigeria, within a 6 months period. The results of the study show that *Fusarium* species were the most predominant, with a frequency of occurrence of 31%, while *Saccharomyces cerevisiae* and *Trichophyton* species were the least populated. Overall, hospital effluent contains a number of fungi, which largely depends on the source of the effluent, and in most cases, are not different from the fungal population isolated from other sources (e.g. soil).
Keywords: Fungi; hospital effluent; public health; environment.

Introduction

Hospital effluent indiscriminately discharged into the environment has continued to be a treat to both humans and wildlife (Ibeh and Omoruyi, 2011). Several independent line of studies, have furthered our understanding of the genotoxic potential of this effluent (Omoruyi et al., 2011; Paz et al., 2006; Ortolan and Ayub, 2007; Gupta et al., 2009), with assertions that effective treatment of hospital effluent helps in the reduction of its genotoxic potential (Gupta et al., 2009). However, in most developing countries, effective treatment and disposal of hospital effluent is still a challenge. In addition to the genotoxic potential of such effluent, a number of bacterial isolates, the majority of which are pathogenic, have been reported in hospital effluent (Omoruyi et al., 2011; Varela et al., 2014; Harris et al., 2014). Furthermore, there is pausation of data, on the fungal population present in hospital effluent. To this end, the current study aim at studying the fungal population present in hospital effluent.

Materials and methods

Wastewater samples were obtained from University of Benin Teaching Hospital (UBTH), Southern Nigeria from May to October 2011. Samples were collected from six different sampling sites located within the premises of UBTH and transported to the laboratory for analysis. Following serial dilution of the effluent samples, 1 ml aliquot was consequently seeded on potato dextrose agar (PDA) and left at room temperature for 5 to 10 days. The fungal growths were identified according to Barnett and Hunter (1972).

Results and discussions

The result of the current study shows that, like bacteria, fungi populations are present in hospital effluent, in sufficient amount. The total fungi counts (Table 1) varied remarkably across the different sampling locations, and months, with the least fungi counts ($3.8 \times 10^3 \pm 1.6$) recorded in June, and the highest ($5.0 \times 10^3 \pm 1.3$) in July. *Fusarium* species were the most predominant fungi isolates (Figure 1), with a frequency of occurrence of 31%, while *Saccharomyces cerevisiae* and *Trichophyton* species were the least populated (10 %).

The majority of the fungi isolates reported in the hospital effluent samples are common in soil, food samples and from the human body (Wogu et al., 2011; Omoruyi and Idemudia, 2011; Aghamirian and Ghiasian, 2012). This therefore implies that the isolates are not peculiar to hospital effluent alone, and in particular, are not immediate source of health concern. Trichophyton are dermatophytes, mainly associated with the human scalp, and their presence in the effluent samples was therefore not unsuspected. As with the case of bacteria, more studies should be carried out to include fungi population in both treated and untreated effluent, as they are also agents of human diseases.

Table 1: Total fungi counts from hospital effluent, across the sampling sites ($x10^3$)

Month	SS1	SS2	SS3	SS4	SS5	SS6	Mean
May	4.0	4.0	7.0	5.0	4.0	5.0	4.8 ± 1.2
June	4.0	1.0	4.0	4.0	6.0	4.0	3.8 ± 1.6
July	5.0	3.0	6.0	6.0	4.0	6.0	5.0 ± 1.3
August	4.0	6.0	3.0	4.0	4.0	6.0	4.5 ± 1.2
September	5.0	5.0	4.0	6.0	3.0	2.0	4.1 ± 1.5
October	4.0	3.0	7.0	4.0	5.0	5.0	4.7 ± 1.4

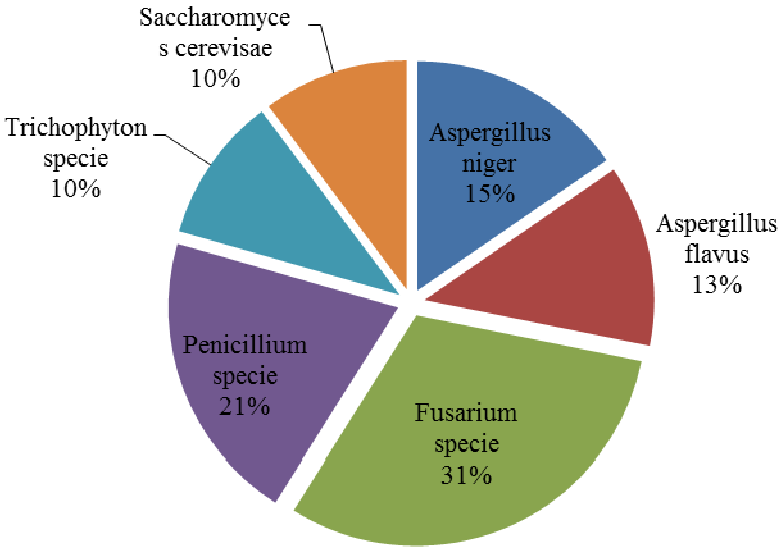

Figure 1: Data showing the frequency of occurrence of different fungi across the sampling sites, during the sampling period.

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