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Environment-isolates of Black Yeasts from Ekant park

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ABSTRACT

Twenty nine isolates of black yeasts isolated from different environmental sources such as soil, water and different plant parts (diseased wood, leaf, flower and fruit). Their preferable niche has been found to be leaves followed by other plant parts. They were less frequent in other ecosystem studied. This is the first report about the ecological survey of black yeast in Bhopal.

Key words: Ekant park, Black Yeast, Environmental**.**

INTRODUCTION

Increasing importance of black yeasts in the field of medical sciences, cosmetology and other fields of biotechnology have attracted the mycologists all over the world (de Hoog *et al*., 2005). In view of the photoprotective function of melanin, its preparations are widely used in dermatology and cosmetology. Melanins also possess antioxidant and antiradical activities (Paramonov *et al*., 2002; Brenner *et al*., 2008). Experiments using the crude enzyme were successful in whitening of the skin (U.S. Patent 7291340). Yeasts having affinities with both ascomycetes and basidiomycetes have been found to produce melanin. Some of them have also been associated with human mycoses. Among melanized pathogenic fungi members of *Herpotrichiellaceae* (black yeasts and relatives) and its teleomorphic family chaetothyrialean fungi are associated with recurrent, clearly defined disease entities such as chromoblastomycosis and neurotropic dissemination in immunocompetent individuals (Zeng *et al.* 2007).

In order to develop a comprehensive management strategy in respect of these melanized yeasts, knowledge of their natural ecology and evolution is essential. Several selective techniques have been developed enabling recovery of these fungi (de Hoog *et al.* 2005; Dixon *et al.* 1980, Prenafeta-Boldú *et al.* 2006, Satow *et al.* 2008, Zhao *et al*. 2008, Sudhadham *et al.* 2008) from various environments such as rock, creosote-treated wood, hydrocarbonpolluted soil, and hyperparasitism of fungi and lichens (Sterflinger *et al*. 1999, Wang & Zabel 1997, Lutzoni *et al.* 2001). It is therefore essential to monitor the presence of black in various environment not only to manage their pathogenic potential but also to derive benefit for human beings.

MATERIALS AND METHODS

Study areas and materials

The soil from forests, parks, grasslands, pond and river water, flowers and leaves of locally available trees and wood samples from different localities of Bhopal city (India) were collected in polythene bags using disinfected spoons and forceps and stored at room temperature in the laboratory until processed. About 5 g of each sample was suspended in 50 ml of sterile physiological saline, containing chloramphenicol (0.05 mg ml–1). The suspension was shaken for 5 min on a vortex mixer and allowed to settle up to 60 min.

Table 1: Black yeast isolates isolated from various environmental sources and sub-sources

S. No.	Sources	Sub-sources	Isolates
1	*Putranjiva roxburghii*	Leaf	PRL21
2	Do	Do	PRL22
3	Do	Do	PRL23
4	Do	Do	PRL31
5	*Jatropha*	Do	JL41
6	*Gardenia gumifera*.	Do	GGL71
7	Do	Do	GGL72
8	Do	Do	GGL73
9	Do	Do	GGL743
10	*Grevia robusta*	Do	GRL22
11	Do	Do	GRL24
12	*Salix spp*.	Do	SSL53
13	Do	Do	SSL54
14	*Butea monosperma*	Do	BML61
15	Do	Do	BML62
16	*Cauroptia guianensis*	Do	CGL3
17	Do	Do	CGL4
18	*Bauhinia varigata*	Flower	BVF34
19	Do	Do	BVF38
20	Do	Do	BVF39
21	*Accacia spp*.	Do	FAY5
22	Do	Do	FAY6
23	*Phoenix sylvestris*	Fruit	PSFR3
24	Do	Do	PSFR4
25	Do	Do	PSFR41
26	*Euclyptus spp*	Diseased wood	EDW51
27	Do	Do	EDW52
28	Narmada river	Soil	NS22
29	Pond (Upper lake)	Water	PW3

Fungal isolation

0.5 ml of above suspension was spread on PDA plates supplemented with chloramphenicol and incubated for a weeks at 30ºC. The representative dark colonies of different morphotypes were then isolated and purified by single cell isolation method and maintain on PDA slant at 4ºC or store as 10% glycerol stock at –15ºC.

RESULTS

As indicated in Table 1, black yeasts were isolated from various samples tested. There were altogether 29 black yeasts isolated from various sources; seventeen from leaves, five from flowers, three from date fruit, two from diseased Eucalyptus plant and one each from river bank soil and pond water. These black yeasts were purified by single cell isolation. These were then kept as glycerol stock at -12ºC.

DISCUSSION

This is clear that the frequency of occurrence of black yeasts on leaf of the plant is more. The other plant parts stand nest as their favourite niche. Probably the availability of monosaccharides on young leaves and other plant parts attract these fungi.

Black yeasts have been isolated from various ecosystem earlier (Dixon *et al*., 1980; de Hoog *et al*. 2005; Satow *et al.,* 2008). The most important aspect is of its association with disease lesion (deHoog *et al*., 2005; Sudhdham *et al*., 2008). Hence a concerted study on their occurrence role in various ecosystem is required.

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