Table 1 *Effect of hydrogen peroxide on viability of spores of A. parasiticus*

H_2O_2 (%)*	Viable count	Per cent killing
0	2.5×10^6	0
0.1	1.5×10^6	40
1.0	1×10^6	60
5	1×10^5	96

*Spores were incubated in saline or hydrogen peroxide for 10 min. Viable counts shown are mean of triplicates.

was 4%; in presence of 1 and 0.1% hydrogen peroxide it was 40 and 60% respectively. Spores were also irradiated in presence of 1 and 0.1% hydrogen peroxide and the survival curves were obtained (figure 1). The D_{10} values are 10.6 krad and 30 krad for 1 and 0.1% hydrogen peroxide respectively. Surviving spores were grown on agar and the colonies were observed under UV light for the presence of aflatoxinless mutants. Several colonies were checked but none of them showed the aflatoxinless phenotype. Similar results were also obtained by Moreno *et al.*[8] who nonetheless obtained a few mutants that showed partial reduction or altered aflatoxin production.

The results obtained suggest that hydrogen peroxide alone can act as an effective killing agent in the case of *A. parasiticus* spores. The spores also showed very low resistance to gamma radiation and a low D_{10} value in saline. Hydrogen peroxide is one of the radiolytic products during radiation and was shown to function as a spore radiation sensitizer in the case of bacteria[9]. In the present experiments irradiation and hydrogen peroxide showed additive effects (figure 1). This suggests that hydrogen peroxide might be one of the intermediates during irradiation, and addition of hydrogen peroxide enhances sensitization of the spores to gamma radiation. Earlier observations[6], showed that hydrogen peroxide along with gamma radiation is an effective system for detoxification of aflatoxin in contaminated food. Thus, the use of hydrogen peroxide and gamma radiation for treating contaminated foodstuffs would be economical and effective, as it results in killing of *A. parasiticus* spores and in degradation of aflatoxin.

One of the authors (UDP) thanks CSIR, New Delhi, for a fellowship.

26 December 1988

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EFFECT OF DIFFERENT MEDIA ON THE MORPHOLOGY AND CULTURAL CHARACTERISTICS OF *CANDIDA ALBICANS*

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THE morphology of various species of fungi is significantly affected by different physical and nutrient media[1-7]. In the present study morphology and cultural characters of *Candida albicans* were studied in five nutrient media. The aim of the investigation was to identify those morphological characters that are stable and can be used conveniently for the identification and differentiation of species of *Candida*.

Two male individuals, aged 42 and 20 years, were brought to the laboratory complaining of severe itching on the toes. The interdigital portions were erethematous, and in severe cases the skin had peeled off leaving pink spots. Scrapings were taken from the area and cultured, and pure cultures prepared. The KOH test gave positive results. The isolate was identified on the basis of the criteria suggested by Frey *et al.*[8] The test isolate was grown on five different agar media, viz. malt agar, potato dextrose agar, glucose yeast extract agar, rice agar and Asthana and Hawkers agar, and incubated at

Table 1 *Effect of different media on growth and morphology of Candida albicans*

	Malt agar	Potato dextrose agar	Glucose yeast extract agar	Rice agar	Asthana and Hawkers agar
Macroscopic characters					
Diam. of colony (cm)	2.8 × 1.5	2.7 × 1.0	2.1 × 1.8	2.2 × 1.9	2.5 × 2.0
Colour	Cream	White to cream	White to cream	White to creamy	Cream
Shape	Oval	Linear	Oval	Egg-shaped	Oval
Microscopic characters					
Shape of blastospores	Hyaline, 1-celled, mostly ovoid, few ellipsoid	Hyaline, 1-celled, mostly ovoid, few ellipsoid	Hyaline, 1-celled, highly guttulated, mostly ovoid, some ellipsoid	Hyaline, 1-celled, highly guttulated, mostly ovoid, few ellipsoid	Hyaline, 1-celled, ovoid to ellipsoid
Size of blastospores (μm)	3.6–4.0 × 7.3–14.4	3 9–4.2 × 8.0–10.5	3.5–4.1 × 8.0–10.9	4.1 × 8.0	4.2 × 5.0–10.1
Mycelium	Few, septate, branched	Profuse	Abundant, septate, hyaline, branched	Abundant, septate, hyaline, branched	Abundant, septate, hyaline, branched
Pseudomycelium	Branched, guttulated	Branched, guttulated	Profusely branched, guttulated	Rarely produced, hyaline, septate	Rarely formed
Chlamydospores	Abundantly produced	Few produced	Abundantly produced	Produced in clusters, abundant	Rarely produced

28 ± 2°C. The media were prepared according to the formulae given by Ainsworth[9]. The colour, shape and diameter of colonies, shape and size of pycnidia and pycnidiospores, nature of mycelium and pseudomycelium, and quantity of chlamydospores produced were recorded after a week.

It was observed that morphology and cultural characters of *C. albicans* were significantly affected by different nutrient media (table 1). The present findings agree with those obtained earlier[1-7]. Growth rate was variable, but shape and colour of the colonies were more or less stable. Formation of chlamydospores was seen in nearly all the test media. The present findings agree well with the results obtained by Rajak and Rai[6]. Kafi and Tarr[4] reported that conidia of *Helminthosporium* species showed remarkable variation in size on different media. Rajak and Rai[6] found that morphology of pycnidiospores of 18 species of *Phoma* was very different on different nutrient media. Singh[5] reported that size and morphology of the conidia of *Phyllosticta cestri* and *Phyllostictina artocarpina* were similarly affected. In the present investigation also, size of blastospores of *C. albicans* was different on different nutrient media. Dorenbosch[10] used chlamydospores as the diagnostic character for differentiating the species of *Phoma*.

On the basis of the above findings, it is obvious that one character cannot be used for identification of the species of *Candida*; several characters, such as colour and shape of colonies, shape and size of blastospores, characteristics of mycelium and pseudomycelium, and formation of chlamydospores, should be considered.

19 December 1988; Revised 18 January 1989

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IMPACT OF DIFFERENT LIQUID MEDIA ON AMYLASE PRODUCTION BY SEED MOULDS OF PEARL MILLET (*PENNISETUM AMERICANUM* (L.) LEEKE)

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DETERIORATION of seeds is usually attributed to the action of amylase secreted by seed-borne fungi. A study of pearl millet (*Pennisetum americanum* (L.) Leeke) seeds revealed constant association of certain fungi responsible for seed deterioration. The present work was carried out to assess the ability of amylase secretion of these fungi.

Seventeen test moulds were isolated from pearl millet seeds collected from field and storage. Amylase production by the moulds was studied by using three different substrate and non-substrate liquid media. Among the fungi isolated, *Aspergillus flavus* and *Curvularia lunata* were found to be highly efficient in amylase production while fungi like *Cladosporium cladosporoides* and *Memnoniella* sp. were found to be not as efficient. Starch medium was superior, compared to pearl millet flour and glucose media, for amylase production by most of the tested fungi.

The agar plate method was employed for isolation of seed-borne fungi. The substrate was 1% starch in a medium containing 0.25% KNO_3, 0.1% KH_2PO_4, 0.05% $MgSO_4 \cdot 7H_2O$. Flasks containing medium (25 ml) were inoculated with spore suspensions of the test fungi and incubated at 25 ± 1°C for 8 days. The culture filtrates were then collected. Sterilized starch assay agar medium (soluble starch 10 g, Na_2HPO_4 2.84 g, NaCl 0.35 g, agar 15.9 g, distilled water 1000 ml, pH 6.0) was poured into sterile petri plates, and 0.2 ml of culture filtrates were placed in a

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