

Mehrotra, *Mucor thermohyalospora* A Subrahm; an unidentified species of *Mucor* (ABCT) and *Talaromyces* sp, for total phenols, soluble protein, lactic and citric acids.

The test fungi maintained on PDA medium were grown on 100 ml static Czapek's Dox - liquid medium (with 3% sucrose) and incubated for seven days at 45°C. Spore suspension (0.1 ml) prepared aseptically by adding 5 ml sterile distilled water on to a healthy sporulating ten-day-old PDA culture slant grown at 45°C was used as the inoculum. Three replicates were maintained for each species and at the end of the incubation period the mycelium was separated by filtering through *Whatman* No. 1 filter paper. The culture filtrates were centrifuged at 3000 rpm for 5 min; 25 ml of this filtrate were refluxed with 80% ethanol for 10 min. The refluxed material was used to estimate total phenols⁸. The filtrate (75 ml) was used to estimate soluble proteins⁹, lactic¹⁰ and citric¹¹ acids. Confirmatory tests for the presence of lactic and citric acids were carried out employing thin layer chromatographic method¹².

The test fungi differed significantly in the extracellular products (table 1). The high protein content observed in *Talaromyces* sp, *Mucor* sp (ABCT) and *N. thermoroseum* respectively, shows their ability to produce large amounts of enzymes and thus a better survivor as observed for species of *Alternaria*¹³ and *Curvularia pallescens*¹⁴.

Phenolic compounds are widely distributed in fungi¹⁵ and the present investigation shows that thermophilic fungi are no exception. Probably, synthesis of these compounds may offer an additional advantage in survival and colonization of these thermophiles in a highly competitive environment. The ability of algae to produce lactic acid, and the amount formed have been found to be significant in the relationship between strains and species of *Chlorella*¹⁶. Though all the four thermophilic fungi produced

significant amounts of lactic and citric acids, *Mucor* sp, (ABCT), produced higher amounts.

The present study clearly indicates the industrial potential of these strains as elaborated from their chemical constituents of culture filtrates.

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Table 1 Phenols, proteins and citric and lactic acids in culture filtrates of some thermophilic fungi (mg/ml)

Constituents	<i>Mucor</i> sp. ABCT	<i>N. thermo-roseum</i> (Tree)	<i>M. thermo-hyalospora</i> (MPV)	<i>Talaromyces</i> sp. (Yellow)
Total phenols	0.1332	0.2376	0.09	0.0477
Citric acid	0.280	0.100	0.210	0.150
Lactic acid	0.029	0.016	0.015	0.008
Protein	0.92	1.0	0.8	5.2

SEXUALITY AND OXIDASE TESTS OF *HEXAGONIA APIARIA* (PERS.) FR.

A. B. DE

Department of Botany, Burdwan Raj College,
Burdwan 713 104, India.

NOBLES¹ put forward the hypothesis that in Polyporaceae, species which possess tetrapolar type of

sexuality are associated with white rots and positive oxidase reactions, while species with bipolar type of sexuality cause brown rots and give negative oxidase reactions. Information so far obtained from the members of the Polyporaceae generally supports this view of Nobles with a few exceptions^{2, 3}. The present paper gives the result of investigation on the sexuality and oxidase tests of *Hexagonia apiaria* (Pers) Fr., a fungus which is reported to cause white rot⁴.

Twenty-five monosporous cultures were isolated from the spores of a sporophore of *H. apiaria* collected from Bankura, West Bengal, India, where it was found growing on a dead wood of *Shorea robusta* Gaertn. Each of these cultures showed good growth; they were checked carefully for clamp connections. The absence of clamp connection was taken as confirmation of their monokaryotic nature. Finally 20 monokaryotic cultures were paired among themselves in all possible combinations by placing the inocula 25–30 mm apart on 2.5% malt agar slants. The culture tubes containing paired inocula were then incubated at room temperature ($26 \pm 2^\circ\text{C}$) for about a fortnight and the hyphae from the line of contact between the paired mycelia were examined under the microscope for the presence of clamp connections. The presence of clamp connections indicated the compatible mating of the paired mycelia and the absence of clamp connections indicated incompatible mating.

Analysis of the results shows that the basidiospores of *H. apiaria* fall into four mating groups on the basis of their compatibility. This indicates that the species is tetrapolar with allelomorphs for heterothallism at two loci. The distribution of mating types among the basidiospores studied is given below following the method of Nobles *et al*⁵, where the conventional symbols $A_1 A_2 B_1 B_2$ have been used to designate the alleles governing the interfertility:

$A_1 B_1$: 1, 5, 6, 12, 15, 20, 22

$A_2 B_2$: 4, 9, 13, 14, 16, 25

$A_1 B_2$: 3, 17, 18, 23

$A_2 B_1$: 8, 10, 19.

Oxidase tests were carried out by growing the polysporous mycelia of the fungus for 7 days at room temperature ($26 \pm 2^\circ\text{C}$) on 2.5% malt agar media containing 0.5% gallic acid and tannic acid in separate petridishes following the method of Davidson *et al*⁶. The appearance of dark coloured zones in the media presented positive proof of the production of extracellular oxidase enzymes by the test fungus.

From these results, it may be concluded that the hypothesis of Nobles¹ also finds support in *Hexagonia apiaria* (Pers) Fr.

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CYTOMIXIS AND CHROMOSOME ELIMINATION IN GROUNDNUT

T. G. K. MURTHY and S. P. TIWARI
National Research Centre for Groundnut (I.C.A.R.),
Junagadh 362015, India.

EVOLUTIONARY significance of cytomixis and chromosome elimination is well documented among plant species¹. These phenomena indicate genetic or chromosomal imbalance of the organisms and lead to stabilization of chromosome numbers after being exposed to natural selection. Alternatively, such phenomena may result from gene mutations as observed in maize², pearl millet³, rice⁴ etc. Groundnut, *Arachis hypogaea*, is an allotetraploid with its genomes derived probably from species like *A. cardenasii* and *A. batizocoi*⁵. Genomes of these species pair among themselves and occasionally show intergenomic chromosome pairing. A triploid obtained from interspecific cross between tetraploid *A. hypogaea* cv Co-1 and a diploid species *A. chacoense*, both belonging to section *Arachis*, was multiplied by stem cuttings. A detailed cytological analysis was made of this triploid hybrid. Root tip mitosis was normal with 30 chromosomes. Last premeiotic mitotic divisions were also normal but fushion of two or more PMCs was observed during preleptotene stage. It was followed by transfer of chromatin between PMCs throughout all meiotic stages. Transfer of chromatin was partial to complete, providing a wide spectrum of chromosome numbers in the affected PMCs. Absence of cytomixis in root tips and the tapetal mitoses suggests that the expression is confined to meiosis only. In this particular case, the