

It could be visualized from these results, that infected material provides the source for air-borne conidia and these, in turn, play a very important role in the contamination of sound stocks handled in these places. At Manasa Gangothri (the University Campus) where samples were collected each day for a period of 2 years, high catches of *A. flavus* were obtained when the wind was blowing from North-East Direction. The Regulated Market and the mills, where very high concentrations were recorded, were found to be situated in North-East direction. So it was felt that these sites might be the chief sources for air-borne *A. flavus* conidia sampled at Manasa Gangothri, 2 km away from it. To verify this a series of samples was taken with Andersen sampler, 8 m above the ground level, at 5 sites and the catches 3,115, 1,044, 100, 70 and 35/m<sup>3</sup> were recorded at Regulated Market, 3 sites in between and at Manasa Gangothri. The data confirms our opinion that the grain markets and mills are the chief sources of air-borne *A. flavus* contamination. The fact that upto 72% of the air-borne conidia of *A. flavus* are toxigenic<sup>8</sup> makes us conclude that the fungus is a hazardous mold in the environment. Apart from contamination of healthy stocks of grain, biodeterioration and mycotoxin production in them, the fungus might play a hazardous role on the health of people exposed to its air-borne spores in the form of mycotic infections and allergic disorders. The statement of Sreenivasamurthy<sup>12</sup> that air-borne spores of toxigenic strains of *A. flavus* might contaminate the food materials is substantiated by the results of the present study.

On the whole peak catches of *A. flavus* were recorded during the winter and rainy periods. This is in agreement with the earlier reports<sup>5,11</sup>.

Even at sites where *A. flavus* was recorded in high concentrations, it was not found to be the dominant air-borne type as reported by some workers<sup>2,3,7,13</sup> but it was found to occupy second, third or fourth positions among *Aspergillus* species.

The data reported in this study necessitates the recognition of *A. flavus* as a hazardous mold in the working environments such as mills, grain markets and poultry sheds. These areas provide the foci of air contamination, and this warrants due consideration in situating such places while planning cities and towns. It is suggested that people working in such areas should wear dust masks to protect themselves from the respiratory hazards.

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P.G. Department of Botany,  
University of Mysore,  
Mysore 570 006, India,  
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K. B. JAYAPRAKASHI,  
E. RATI,  
A. RAMALINGAM.

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#### TEMPERATURE DEPENDENT OSMOTIC REMEDIAL MUTATION INDUCED IN THE ADENINE BIOSYNTHETIC PATHWAY IN *TORULOPSIS BOVINA*

THE nature of the mutations induced in an auxotroph differs widely. These may be temperature sensitive or pH sensitive and a few may be osmotic remedial or temperature dependent osmotic remedial. In all these cases, the auxotrophic mutants may not require the growth factors in minimal medium and behave as prototrophs, when grown under the above specific conditions. Employing a purple diauxotrophic mutant of the yeast *Torulopsis bovina*, requiring purine (adenine/hypoxanthine) and sulfur amino acid (methionine/cysteine), the nature of the mutation induced in the adenine biosynthetic pathway was studied. In this report, evidence is presented for the possible occurrence of missense type of mutation in the adenine biosynthetic pathway.

The purple diauxotrophic mutant of *T. bovina* was examined for temperature sensitivity and for growth on hypertonic media to elucidate the possible nature of the genetic changes induced in the adenine biosynthesis (the mutant was found to have block in the conversion of 5-aminoimidazole ribonucleotide to 5-amino-imidazole-4-carboxylic acid ribonucleotide). Tests were carried out at 27°, 32° and 37° C on the modified Wickerham's minimal medium<sup>1,2</sup> made hypertonic with sucrose or potassium chloride<sup>3</sup>. Growth patterns observed for the mutant on media

TABLE I

Growth response of the diauxotrophic mutant of *T. bovina* on hypertonic media at three levels of temperature

Incubation temperature**	KCl in minimal medium				Sucrose in minimal medium					
	0.0 molal		0.067 molal		1.33 molal		0.0 Molal		0.067 Molal	
	Mutant	Wild*	Mutant	Wild	Mutant	Wild	Mutant	Wild	Mutant	Wild
27° C	-	+	±	+	-	+	-	+	±	+
32° C	-	±	+	±	+	±	-	±	+	±
37° C	-	-	+	-	+	-	-	-	+	-

Note.—The mutant (ad<sup>-</sup>, meth<sup>-</sup>) colonies grown on minimal medium (supplemented with adenine and methionine) were replica-plated<sup>6</sup> on minimal medium agar plates (supplemented with methionine only) containing either potassium chloride or sucrose. Growth was observed for over a period of 3 days.

\* Wild-type was also replica-plated as control.

\*\* Normal temperature for growth is 26–27° C. The wild-type and the mutant growth poorly at 32° C and do not grow at 37° C.

+ = Normal growth; ± = poor growth; - = no growth.

lacking adenine and made hypertonic are seen in Table I.

From the results it can be seen that the mutant colonies did not grow on media not supplemented with either potassium chloride or sucrose incubated at the above temperatures, suggesting that the induced mutation was not temperature sensitive. However, the mutant showed poor to no growth either on potassium chloride or sucrose supplemented media incubated at 27° C. On the other hand, there was efficient growth of the mutant on hypertonic media incubated at 32° and 37° C, indicating that the mutation induced in the adenine biosynthetic pathway was temperature dependent osmotic remedial. Mutants exhibiting growth on minimal medium in response to temperature changes or increased osmotic pressure or combination of both, have been interpreted as due to missense mutations<sup>3–5</sup>. Missense mutations induced in DNA lead to the substitution of one amino acid for another in the polypeptide chain. Such a change may result in a partial enzymatic inactivation which becomes absolute under specific conditions of temperature and pH. Mutations of similar kind might be involved in the mutant of *T. bovina* in the adenine biosynthetic pathway enabling the growth on hypertonic medium at higher temperatures.

Department of Microbiology,  
Osmania University,  
Hyderabad-7 (A.P.),  
May 18, 1978.

S. P. RAO.  
H. POLASA.\*

\* Reprints may be obtained from Prof. H. Polasa.

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#### CYTOCHEMICAL STUDIES ON THE EFFECT OF KINETIN ON CUCUMBER COTYLEDONS

KINETIN-inducible developmental steps depend upon RNA synthesis<sup>1</sup>. An open question is how kinetin stimulates RNA synthesis. There are several pathways for its mode of action<sup>2</sup>. The present study examines a novel effect of kinetin on histone composition and subsequent changes in endogenous levels of RNA in isolated cucumber cotyledons.

Seeds of *Cucumis sativus* were surface sterilized with 0.01% mercuric chloride and germinated in dark at 25 ± 2° C. Cotyledons were excised and floated on distilled water or on 10 ppm kinetin since it showed maximum stimulatory effect on the expansion growth of cotyledons (Table I). After 24 and 48 hours of incubation cotyledons were fixed in Carnoy's fluid and neutral buffered formalin. In 10 microns thick sections of cotyledons, RNA and histone fractions were localized in the manner suggested by Tepper and Gifford<sup>3</sup> and Black and Ansley<sup>4</sup> respectively. Extinction values and relative content of RNA were measured with the help of cytophotometer<sup>5,6</sup>.