SHORT COMMUNICATIONS

VARIETAL SCREENING OF SOME CEREALS AGAINST AFLATOXIN ELABORATION

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AVAILABLE literature substantiates aflatoxin contamination in cereals[1-3]. Use of resistant variety is considered to be one of the best measures to control aflatoxin production[4]. The present study was therefore conducted to screen some of the varieties of rice, wheat, maize and barley against aflatoxin elaboration by a toxic strain of *Aspergillus flavus*.

Seven varieties of rice, Pankaj, BR–9, Rasi, Pusa–33, ES–1–2–3, CR–44 and Sita, eleven varieties of wheat, BR–3016, HUW–12, HD 2307, HP 1102; K 8027, Sonalika, K. Sona, K–65, HP 1209, C 306 and UP 262; three varieties of maize, M_{12}, M_{13} and UPB 742 and five varieties of barley P 267, Karan–18, Jyoti, BR–31 and Ratna were infested by the known toxigenic strain of *A. flavus*. After 10 days of incubation at 28 ± 1°C the samples were sprayed with ethyl alcohol and dried at 60°C for 24 hr. Aflatoxin was extracted according to the method of Sietz and Mohr[5]. Qualitative and quantitative estimation of aflatoxin was done by the method of Reddy *et al*[6] and Nabney and Nesbitt[7], respectively. The identity of aflatoxin was confirmed by trifluoroacetic acid[8].

Aflatoxin production varies in different cereals viz rice, wheat, maize and barley as well as in different varieties of cereals. All the varieties of rice supported synthesis of aflatoxin. However, the degree of its elaboration varied considerably. Sita and BR–9 varieties were highly susceptible elaborating 4150 μg/kg and 3712 μg/kg respectively of aflatoxin, CR–44 and Rasi supported lower amount of aflatoxin (1470 μg/kg and 1590 μg/kg respectively) and were rated moderately resistant.

All the test varieties of wheat also supported aflatoxin elaboration, K–65 and HP 1102 were highly susceptible (1633 μg and 1700 μg/kg of grain respectively). K–Sona was moderately resistant (816 μg/kg).

Among the maize varieties all the three varieties namely M_{13}, UPB 742 and M_{12} were highly susceptible and elaborated up to 1780 and 1420 μg/kg of grain respectively.

Most of the test varieties of barley were resistant of which Ratna was highly resistant (no elaboration of aflatoxin) while P 267, Karan–18, Jyoti and BR–31 produced aflatoxin in traces.

Differential behaviour of various varieties of rice, wheat, maize and barley towards elaboration of aflatoxin by the same toxigenic strain of *A. flavus* might be attributed to their genetical make up[4]. The Agricultural Research Service of USDA released 2 genotype of peanut with tolerance to toxin producing strains of *A. flavus*. CR–44 and Rasi varieties of rice and Kalyan Sona variety of wheat, though supported quite low amount of toxin, quantitative toxin elabo-

Table 1 *Aflatoxin production in different varieties of rice, wheat, maize and barley by the toxigenic strain of Aspergillus flavus*

Paddy		Wheat		Maize		Barley	
Variety	Production of aflatoxin B_1 (μg/kg)	Variety	Production of aflatoxin B_1 (μg/kg)	Variety	Production of aflatoxin B_1 (μg kg)	Variety	Production of aflatoxin B_1
Sita	4150	HP 1102	1700	M_{13}	1780	P 267	Trace
BR–9	3712	K 65	1633	UPB 742	1690	Karan	"
Pusa–33	2512	HP 1209	1590	M_{12}	1420	Jyoti	"
Pankaj	2170	HUW 12	1470			BR–31	"
ES–1–2–3	2170	HD 2307	1450			Ratna	Nil
Rasi	1590	BR 3016	1290				
CR–44	1470	C 306	1240				
		K 8027	1207				
		UP 262	1180				
		Sonalika	1108				
		K. Sona	812				

rated by them was more than the recommended safe level.

In the present investigation all the three maize varieties were susceptible to *A. flavus* infection and toxin elaboration. Earlier Bilgrami *et al*[9] conducted laboratory screening of fifteen varieties of maize and found none of them to be resistant. The three varieties of maize under present study could be an addition to their list.

It is interesting that none of the barley varieties was supporter of toxin elaboration. Evidently it is related to some specific genetic make-up, which needs further investigation.

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ASPLENIUMSPORITES TRIVEDII GEN ET SP NOV FROM THE NEYVELI LIGNITE OF SOUTH INDIA

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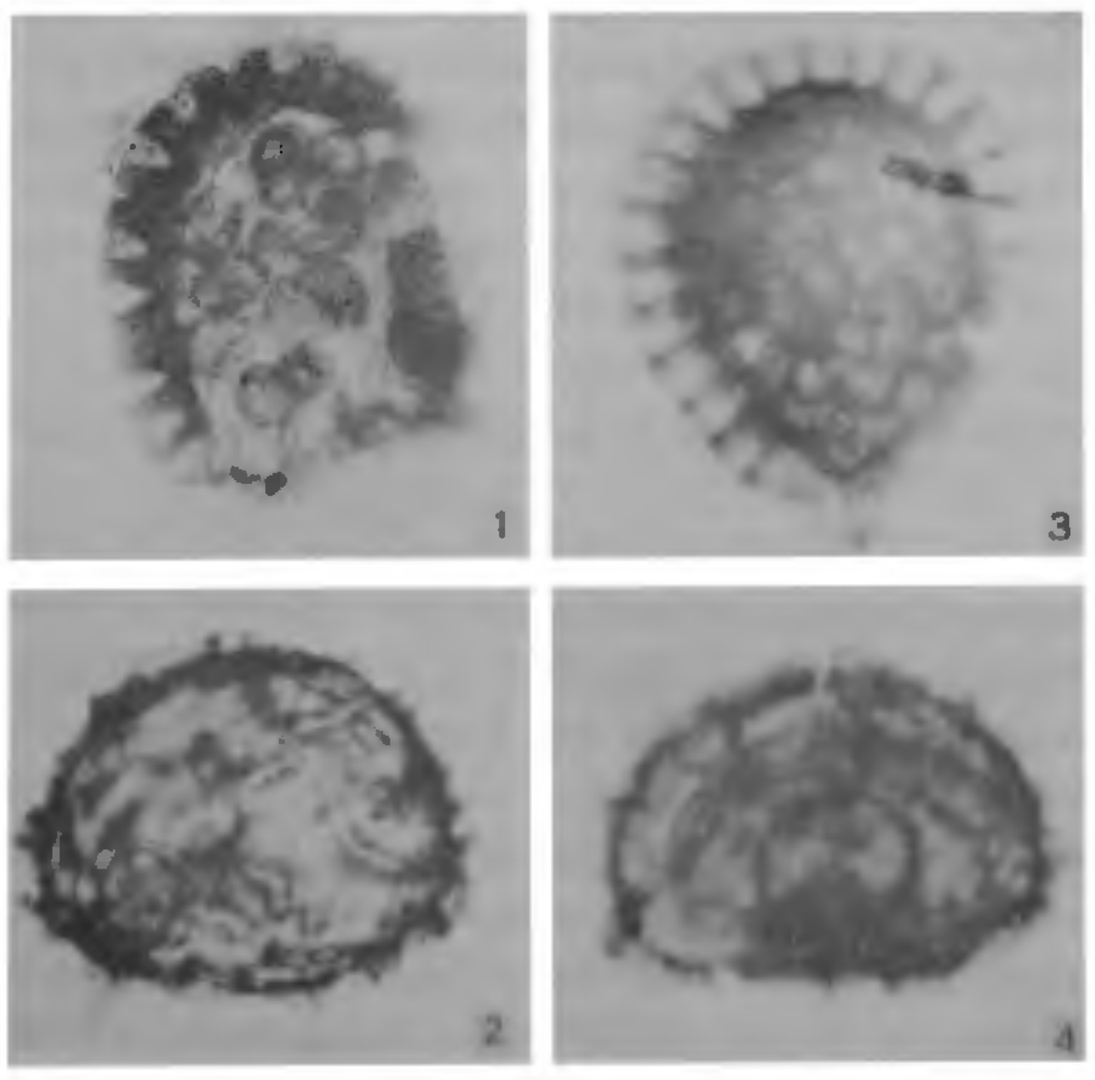
MATERIAL for the present study was collected from Neyveli lignite mine which lies in NE-SW between parallels 79° 24′ and 79° 33′N, and 11° 24′ and 11° 37′ E in the South Arcot District of Tamil Nadu. Slides prepared from this material after maceration showed well-preserved sporangia with spores, and these were studied in detail.

Diagnosis: Spores more or less bean shaped, sometimes oval, 52 × 33 μm in size, monolete, lete distinct to indistinct extending up to 3/4 along the longitudinal axis, perine present, well-developed; translucent, wrinkles forming folds and projections, like vaculae, cone etc exine generally smooth, deep brown in colour, (figure 2). The spores occur enclosed within a sporangium, 246 × 164 μm in size having 15–16 annulus cells which have their walls 1.7 μm thick (figure 1).

Comparison: Polypodiosporites[1] resembles the present genus in general configuration, however, it can easily be distinguished from the present spores because of the absence of perine, *Polypodiosporites*[2] has varrucose ornamentation, *Laevigatosporites*[3] is laevigate and thus easily distinguished from the present spore.

The spore and sporangia described here show resemblance with the members of Polypodiaceae in general appearance. Earlier studies[4,5] described such sporangia as polypodiaceous type but a critical study of the spores reveals that these are altogether different from the members of Polypodiaceae because of the presence of perine and supralaesural folds which are characteristic of the family Aspleniaceae.

Spores of extant *Asplenium* 52 × 28 μm and fossil spores 52 × 33 μm show close resemblance in size with each other (figures 2 and 4). The shape and



Figures 1–4. **1.** Fossil sporangium with spores (× 125); **2.** A fossil spore (× 500); **3.** Sporangium of *Asplenium fontanum* with spores (× 125); **4.** A spore of *A. fontanum* (× 500).