

Short Communication

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AFLATOXIN CONTAMINATION IN CHEWING TOBACCO (*NICOTIANA TABAC-CUM* L.)

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The natural occurrence of aflatoxins in agricultural and food commodities has been reported from several parts of the world. In India, tobacco is consumed by large number of people. It has been found that tobacco is prone to attack by various fungi e.g. *Aspergillus flavus*, *Penicillium* spp. etc, due to the unhygienic storage. Analysis of a number of samples of tobacco from Agra and Mathura was carried out.

Key Words : Aflatoxin, carcinogenicity.

Tobacco is extensively used in India for the purpose of chewing and snuffing besides the manufacture of cigarette, cigar, cheroot, bidi, etc. Tobacco and its products are being suspected these days as items of great risk to consumers due to the hazardous effects to the extent of its irreparable effects like carcinogenicity. Aflatoxin is also well known for its carcinogenic effects and the incidence of aflatoxin has been reported in various food commodities (Bilgrami, 1983). In India Sreenivasamurthy *et al.* (1965) reported the incidence of aflatoxin in Indian peanuts and cereals. Concurrence of mycotoxicity was also reported by *A. flavus* (Choudhary and Manjrekar, 1967). High percentage of toxigenic *A. flavus* strains associated with different samples of maize, paddy and sorghum were also reported (Mall *et al.*, 1983 Sinha, 1983; Nusrath and Ravi, 1983; Tripathi 1973). Singh (1983) also reported mycotoxins in dry fruits and spices. Roy *et al.* (1988) reported aflatoxin in some common drugs plants. The present study was undertaken to assess the extent of aflatoxin in chewing tobacco.

Forty three samples of chewing tobacco collected from Agra and Mathura were tested. These samples were analysed for the presence of aflatoxins (Ciegler *et al.*, 1971). Qualitative and quantitative estimation of toxins was made by comparing the Rf values with those of standards by spotting on the same silica gel plates in different solvent systems.

It was interesting to note that almost all varieties of tobacco were positive to toxigenic species of fungi and many of them appeared positive to aflatoxin. The extractive magnitude of aflatoxin was variable in

Table 1: List of fungi associated with different samples of Tobacco with their percentage frequency

S. No.	Fungi	Percentage frequency							
		Plain tobacco	Silver coated tobacco	Plain tobacco (with lime)	Surati	Main-puri	Black tobacco	Sheera mixed tobacco	Special blended
01.	<i>Aspergills flavus</i>	70	-	6	33	50	46	-	-
02.	<i>A. fumigatus</i>	67	-	6	-	33	50	15	-
03.	<i>A. parasiticus</i>	10	9	3	-	-	-	-	-
04.	<i>A. niger</i>	37	18	66	66	-	100	100	25
05.	<i>A. terreus</i>	13	18	10	16	-	-	-	-
06.	<i>A. nidulations</i>	-	9	-	-	-	-	-	-
07.	<i>Penicillius evclopius</i>	10	27	6	33	-	-	-	-
08.	<i>P. purpurogenus</i>	-	18	3	16	-	-	-	-
09.	<i>Fussrius leteritus</i>	-	-	3	-	-	-	-	-
10.	<i>Alternaris</i> sp.	3	-	-	-	-	-	-	-
11.	<i>Trichophyton</i> sp.	-	-	3	-	-	-	-	-
12.	<i>Candida</i> sp.	3	-	30	16	-	-	-	-
13.	<i>Mucor</i> sp.	10	9	10	-	80	-	8	25
14.	<i>Rhizopus</i> sp.	3	-	3	-	20	-	8	-

various types of tobacco as shown in Table 1. Qualitatively only aflatoxin G1 could be recognised. Out of 43 samples of tobacco analysed, 31 were found positive for aflatoxin.

Association of toxigenic isolates of *A. flavus* with food commodities is common. Besides producing aflatoxins these fungi also cause considerable damage to the nutritive quality of the associated substrates (Sinha and Singh, 1982). In the present study different isolates of Aspergilli obtained from different samples were found to be toxigenic and they produced different components as well as different levels of aflatoxins.

Aflatoxin contaminated samples also differ in the amount of toxins. The highest level of aflatoxin was detected in plain tobacco. Consumption of such a high level of aflatoxins present in tobacco is of great concern as it is customary to chew tobacco in India, even some chronic addict put it into the mouth

throughout the day resulting in cuts and mouth ulcers. Some people also have the habit of keeping tobacco overnight even while sleeping so that the contaminations of tobacco have enough opportunity to establish their pathological effects. The aflatoxin is well known carcinogen causing damage to liver and other vital organs. Thus, the contamination of aspergilli in tobacco is of great concern.

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REFERENCES

- Bilgrami K S 1983 Mycotoxin problem in food and feed, some social obligations and strategy for future. In "*Mycotoxins in food and feed*" (Eds. K.S. Bilgrami, T. Prasad and K K Sinha), Allied Press, Bhagalpur, p. 1-14.
- Choudhary P G & S L Manjrekar 1967 Preliminary observations on biological activity of pure aflatoxin B1 in chick embryos, *Ind Vet J* **44** 543.
- Ciegler A, S Kadis & J A Samuel 1971 *Microbial Toxins Fungal Toxins* Vol VI Academic Press New York and London 573.
- Mall O O, K K Ranwawat & S K Chauhan 1983 Mould Flora and aflatoxin contamination in maize kernels In *Proc Symp Mycotoxin in food and feed* (eds Bilgrami K S, T Prasad and K K Sinha) Allied Press Bhagalpur 37-44.
- Nusarath M & V Ravi 1983 Incidence of Mycotoxins in paddy from A. P. *Proc Symp Mycotoxins in food and feed* (eds Bilgrami K S, T Prasad and K K Sinha) Allied Press, Bhagalpur 15-22.
- Roy A K Sinha K K & H K Chourasia 1988 Aflatoxin contamination of some common drug plants, *Appl and Environ Micro* **54** 3 842-843.
- Singh Anjana 1983 Mycotoxin contamination in dry fruits and spices. *Proc Symp Mycotoxins in food and feed* (eds Bilgrami K S, T Prasad and K K Sinha) Allied Press, Bhagalpur
- Sinha K K 1983 Aflatoxin problem in storage and standing maize crops. In *Proc Symp Mycotoxins in food and feed* (eds Bilgrami K D, T Prasad and K K Sinha) Allied Press, Bhagalpur.
- Sreenivasmurthy V. Jayaraman & H A B Parpia 1965 Aflatoxin in Ind. Peanuts-analysis and extraction In *Mycotoxins in food stuffs* (ed G N Wogan) 252-260 M T M Press Cambridge Massachusetts.
- Tripathi R K 1973 Aflatoxin in sorghum grains infected with head moulds, *Ind J Exp Biol* **2** 361-362.