# ELABORATION OF MYCOTOXINS BY FUNGI ASSOCIATED WITH TIL (*SESAMUM INDICUM* L.)

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SINCE the initial report of mass death of turkeys due to feeding of peanut imported from Brazil, several surveys have been conducted in different parts of the world for mycotoxins[1-5]. Uraguchi and Yamazaki[6] reported the occurrence of aflatoxins in almost all the food commodities and commercial feeds. In India except for aflatoxins, there has been practically no systematic survey on the occurrence of other mycotoxins. In the present investigation the toxigenic potential of fungi, associated with seeds of til (*Sesamum indicum*) was investigated and the results discussed.

Thirty six fungal species were obtained from 105 seed samples of til. The fungi were screened for their toxigenic potentials. The methods of extraction and detection of mycotoxins were similar to those described in AOAC. The results are presented in table 1.

It is evident that several species of *Aspergillus*, *Fusarium*, as well as *Penicillium citrinum* are capable of elaborating a very wide range of mycotoxins. Similarly Bilgrami *et al.*[7] also reported large number of fungi associated with maize to synthesize different mycotoxins.

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TABLE 1

*Production of mycotoxins by some sesamum seed-borne fungi.*

| Name of the fungi | Solvent System | Flourescence under U.V. Before spray | Flourescence under U.V. After spray | Rf Value | Chemical Confirmation | Mycotoxin |
|---|---|---|---|---|---|---|
| *A. flavus* | C:A | Green | – | 0.31 | – | $G_1$ |
| | | Blue | – | 0.44 | – | $B_1$ |
| *A. fumigatus* | T:Ea:F | Bright blue | – | 0.77 | – | Gliotoxin |
| *A. nidulans* | C:M:A | Dull Brick red | Yellow | 0.90 | $AlCl_3$/KOH | Sterigmatocystin |
| *A. ochraceus* | T:Ea:F | Greenish blue | Bright blue | 0.65 | $AlCl_3$/NaOH | Ochratoxin |
| | | Greenish blue | Bright blue | 0.82 | | |
| *A. terreus* | T:Ea:F | Dark spot | – | 0.45 | – | Patulin |
| *F. oxysporum* | T:Ea:F | Light pinkish | – | 0.15 | $H_2SO_4$ | |
| | | | Dark brown | 0.83 | | Fusarenone-x |
| *F. scirpi* | T:Ea:F | Bright blue | – | 0.47 | | |
| | | Blue green | – | 0.75 | | |
| | | Blue green | – | 0.90 | | |
| | | | Sky blue | 0.81 | $H_2SO_4$ | diacetoxyscirpinol |
| *F. semitectum* | T:Ea:F | Sky blue | Still more bright | 0.075 | $H_2SO_4$ | |
| | | Blue green | – | 0.73 | | Zearalenone |
| | | Blue green | – | 0.87 | | |
| | | | Sky blue | 0.88 | | |
| *F. solani* | B:A | Red purple | – | 0.14 | – | Napthazarin derivatives |
| | | Red | – | 0.45 | – | Fusarubin |
| | | Red | – | 0.63 | – | Javanicin |
| | | Purple | – | 0.73 | – | Anhydro fusarubin |
| *P. citrinum* | E:Ea:A | Lemon yellow | Blue green | 0.95 | $AlCl_3$ | Citrinin |

A = acetone, B = benzene, C = chloroform, Ea = ethyl acetate, F = formic acid, M = methanol, T = toluene.

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## OCCURRENCE OF PENTASOMIC AND HEXASOMIC PLANTS IN WILD POPULATION OF *COIX GIGANTEA*

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CHROMOSOMAL deviation from the normal, resulting in nullisomics ($2n-2$) on the minus side and double trisomics ($2n+1+1$) and tetrasomics ($2n+2$) on the plus side have been reported in several plants[1]. Further reduction and/or increase in the chromosome number in individuals possessing less than $2n-2$ *i.e.* $2n-3$, $2n-4$ etc.) or more than $2n+2$ (*i. e.* $2n+3$, ($2n+4$ etc.) are extremely rare situations and occur only *exceptionally, if at all. Higher polysomics involving* sex chromosomes have been reported so far only in human abortuses[2]. However, in a population of *Coix gigantea* ($2n=20$), a pentasomic ($2n+3$, *i. e.* $2n=23$) and a hexasomic ($2n+4$, *i. e.* $2n=24$) plant have been isolated and are being reported here for the first time. In addition, several other common aneuploids were also isolated from this population.

Plants of *C. gigantea*(tribe Maydeae, family Poaceae) were collected from a wild population growing in the Western Ghats the mountain ranges on the west coast of Peninsular India. Single plant cytological study was carried out in the plants of this population which on preliminary screening was suspected to comprise of a mixture of cytotypes. Young male racemes were fixed in acetic-alcohol (1:3), mordanted with ferric chloride and the anthers were squashed in aceto-carmine (1%). Squashes were made permanent using the liquid carbon dioxide freezing technique[3] and the slides were deposited in the Cytogenetics Unit of this Department.

*C. gigantea* occurs in two cytological forms, $2n=20$ and $2n=40$[4-7]. The present population comprises plants mostly with $2n=20$ chromosomes. Among a total of 96 chromosomal variants screened from this population, the various aneuploids appeared as: 68 nullisomics ($2n=18$), 13 monosomics ($2n=19$), 12 trisomics ($2n=21$) and one each a tetrasomic ($2n=22$), pentasomic ($2n=23$) and hexasomic ($2n=24$). Chromosomal variants in *C. gigantea* from $2n=18$ to 22 have been reported earlier by Venkateswarlu *et al*[8]. However, the pentasomic and hexasomic plants are being reported for the first time in the plants in general, and particularly in the genus *Coix*.

The five homologous chromosomes in the pentasomic plant formed a pentavalent (in addition to other nine bivalents) in the majority of PMCs at diakinesis (figure 1). The other chromosomal configuration

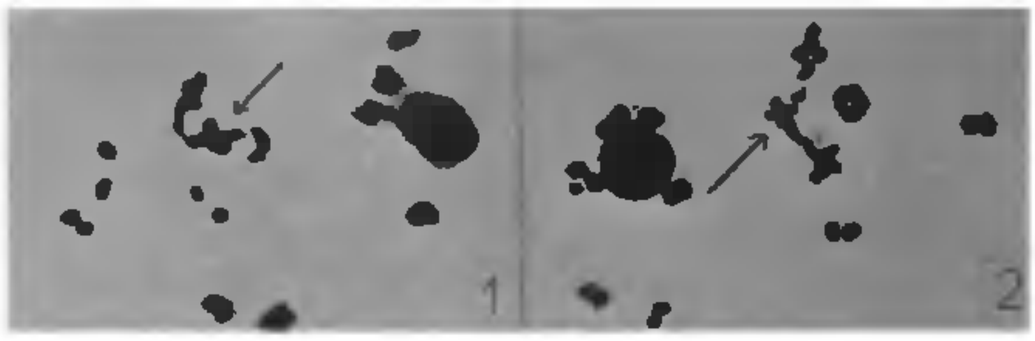


**Figure 1&2** 1 -Diakinesis in a pentasomic showing V+7 II+4I. 2- Diakinesis in a hexasomic showing VI+9II.

(Note: Arrow in each, points pentavalent and hexavalent respectively. Magnification - × 3,000)

involving the five homologous chromosomes appeared as: *III+II*, *IV+I*, and *II+II+I* in decreasing frequency (table 1). Similarly, the six homologous chromosomes in the hexasomic plant formed a hexavalent in most of the PMCs at diakinesis (figure 2). The other associations involving the six homologous chromosomes appeared as: IV+II, 2II+2I, III+II+I, 3II, III+III, V+I, III+3I, II+4I and IV+2I in decreasing order (table 2).

TABLE 1

*Chromosomal valency involving five homologues at diakinesis in a pentasomic plant.*

| Total number of PMCs scored | V | III + II | IV+I | II+II+I |
|---|---|---|---|---|
| 248 | 122 | 68 | 38 | 30 |

Generally, reduction or addition of chromosome(s) to the diploid constitution leads to weaker aneuploid