Short Communication

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INHIBITION OF AFLATOXIN PRODUCTION ON MAIZE AND MUSTARD CROP VARIETIES BY AQUEOUS EXTRACT OF *EUPHORBIA HIRTA* L.

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The antiaflatoxigenicity of aqueous extract of *Euphorbia hirta* L. was tested in the varieties of maize and mustard crops. The maximum inhibition of aflatoxin was observed in DC (33.42%) followed by SC (27.56%) and M_9(19.25%). In mustard crop, 73.84% aflatoxin inhibition was recorded in Varuna and 50.56% in BR-40.

The therapeutic values of *E. hirta* is well known in curing branchial eye, stomach and kidney troubles. In addition, Santhal tribals, Bihar, largely use its juice in lactating mothers when they are suffering from milk deficiency or in the condition of failure of lactation. Antiaflatoxic property in aqueous extract of *E. hirta* is earlier described under laboratory conditions by Singh and Sinha (1985). However, Its role in crop protection against the growth of aflatoxigenic strains of *Aspergillus flavus* is not known so far. In the present investigation aqueous extract of *E. hirta* was tried to record its influence against aflatoxin contamination in maize and mustard crops.

Maize varieties Diara Composite (DC), Suwan Composite (SC) and M_9 and mustard varieties Varuna and BR-40 were cultivated separately in strip-strip potting with adequate irrigation and fertilizer facilities. Maize crop was cultivated during Kharif (June-Sept.) and mustard crop during Rabi (Oct.-Feb.) seasons of 1989-1990.The inoculum of toxigenic strain of *A. flavus* (SRRC-1007) was injected after seed setting in the maize cobs and by spraying spore suspension (100 spores/ml) on mustard pods. After 7 days of inoculation, aqueous extract (2:10 w/v) of *E. hirta* was sprayed on maize cobs and mustard pods. Control set was maintained with sterile distilled water. After harvest, seeds of maize and mustard were collected separately and extraction of aflatoxins was carried out by methanol-chloroform (Thomas *et al.*, 1975). Type of aflatoxins were confirmed by thin layer chromatoplate as described by Reedy *et al.* (1970) and their quantitation by fluorodensitometer (CAMAG-TLC Scanner). The chemical confirmation of aflatoxins was done by trifluoroacetic acid and 50% sulphuric acid aqueous solution as suggested by Stack and Pohland (1975).

Aflatoxin contamination was significantly inhibited in maze and mustard crops by the treatment of *E. hirta.* The control (untreated) maize plants exhibited 2140 μg/kg aflatoxin B_1 level in variety M_9 which followed by SC (1640 μg/kg) and DC (958 μg/kg). However, treatment with *E. hirta* prevented significantly to aflatoxin elaboration which was recorded 33.42% in variety DC, 27.50% in SC and 19.25% in M_9. Untreated (control) mustard crop also exhibited high level of aflatoxin B_1 contamination after infestation of *A. flavus* toxigenic strain. The aflatoxin B_1 amount detected in variety Varuna was 1101 μg/kg and in BR-40 981 μg/kg. After treatment with *E. hirta* to mustard crops, 73.84% aflatoxin production was inhibited in variety Varuna and 50.56% in BR-40.

Maize and mustard crops exhibited high degree of aflatoxin inhibition by the treatment of *E. hirta* aqueous extract. Such inhibition possibly due to interference of active ingradients of the extract which causing interruption of growth and toxin producibility of the *A. flavus*. Earlier Singh (1981) and singh and sinha (1985) also suggested inhibition of aflatoxin production *in vitro* with the extract of *E. hirta.* Results also indicated the variation of toxin producibility of *A. flavus* (SRRC-1007) as well as variation of toxin inhibition potentiality of *E. hirta* with regards to crop varieties. This may be attributed to the nutritional factors of the varieties. There are distinct variation in the nutritional composition of two varieties. Thompson *et al.* (1984) and Kumar (1990) have also found such type of variation of

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aflatoxin production between two varieties. Our findings thus, may suggests that, if inhibitory factor of *E. hirta* could be examined that can be advantageous for preventing/minimizing aflatoxin contamination in maize and mustard crops.

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