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# Population dynamics of mycoflora in BLSB susceptible maize varieties

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#### Abstract

Seed mycoflora of three varieties susceptible to Banded leaf and Sheath blight disease of maize was isolated from fresh harvest of 2007 following agar plate method. The results indicated the presence of fifteen species belonging to eleven genera. Highest percentage of *Aspergillus niger* was recorded in all tested varieties. The effect of dominant fungi on seed germination, seedling growth, and their fresh and dry weight and vigour index was recorded. It showed that highest (94%) percent of seed germination was observed in control.

Keywords:- Maize, Seed mycoflora, Banded leaf and sheath blight, Susceptible, Rhizoctonia solani

#### Introduction

Maize (*Zea mays* L.) is an important cereal crop of the world. In India maize occupies fifth place in area and fourth in production among the major cereals grown poor seed germination, seedling growth and no. of diseases are responsible for the low productivity seed borne mycoflora is a term indicating the association of fungi with seeds or parasitic, easily penetrating into the seed causes instant death or delayed systemic infestation of the emerging seedling. In India maize suffers from a number of diseases viz., Rust and Smut of maize, Charcoal rot, Sclerotial blight (Banded leaf and sheath blight), Bacterial stalk rot, Turcicum leaf blight etc. Among these Banded leaf and sheath blight and bacterial stalk rot are economically important. Banded leaf and sheath blight disease is caused by the most versatile and dreaded pathogen *Rhizoctonia solani* (Kuhn). Banded leaf and sheath blight causes 15-20% yield losses annually (Saxena, 2002).

The yield and emergence of seeds are to known to be affected by a number of factors among which seed borne microbes are prominent. The longevity of seed is determined largely by fungi. Extensive work has been done on seed mycoflora of different crops in India (Singh *et al.*, 1973; Borah *et al.*, 2003; Das *et al.*, 2003; Wattal and Puttoo, 2003).

Present study was carried out to check the seed mycoflora of some varieties popularly grown by maize farmers in district Bahraich, the percentage occurrence of isolated mycoflora and their effect on germination, seedling growth and vigour.

# Materials and Method

Seeds of three popular Cv. of maize viz., Amar, Sweety and Suguna were collected from different seed lots in different agroecological regions of Bahraich district following ISTA (1993). These Cv. are susceptible to Banded leaf and sheath blight disease. The freshly harvested seeds of maize varieties 2007 was used as seed samples. For isolation of all possible mycoflora associated with 100 surface sterilized seeds by 2% Sodium hypochlorite (NaOCI) and 100 unsterilized seeds were plated by following standard technique, agar plate method (APM). Observations were done after seven days of incubation at

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 $temperature 25^{\circ}C. Number of colonies of each fungus were counted and percentage occurrence of each fungus was calculated.$ 

For testing the pathogenic behaviour of dominant fungal forms towel paper method was followed (ISTA, 1993). 1\*10<sup>6</sup> cfu of *Aspergillus niger, Aspergillus flavus* and *Aspergillus fumigatus* were inoculated with surface sterilized seeds. Observations were recorded after seven or eight days of incubation. Control was also maintained for comparison. Germination percentage, fresh and dry weight of root and shoot along with their length was observed. Vigour index was also calculated following Abdul-Baki and Anderson (1973).

# **Results and Discussion**

The result reveals fifteen species were found associated to all tested varieties at varying level of incidence. Ten species were detected from Cv., Amar; nine from Sweety; ten from Suguna.

**Cv.Amar:** Aspergillus niger, Aspergillus fumigatus, Aspergillus flavus, Aspergillus ochraceous, Alternaria tenuis, Curvularia lunata were associated internally. Rhizopus nigricans, Penicillium citrinum, Fusarium roseum and Phoma sp. was associated externally.

**Cv.Sweety:** *A.niger,A.fumigatus,A.tenuis,C.lunata,R.nigricans* were associated externally while *A.flavus,F.roseum,Phoma* sp. was found associated internally.

**Cv.Suguna:***A.niger.A.fumigatus,A.alternata,Dreschelra* sp.,*C.lunata,Mucor variens* were externally associated and *A.flavus,P.citrinum,F.roseum,Monilia* sp. were internally associated with seeds.Neither a single colony of *Rhizoctonia solani* was observed in all tested varieties.

The effect of seed borne fungi on germination showed the maximum (94%) in control and minimum (74%) in *A.flavus* inoculated seeds. Highest root length (10.0cm) was observed in *A.flavus* and lowest (6.8cm) in *A.niger* inoculants. Highest shoot length (7.0cm) was recorded in *A.fumigatus* and lowest (3.2cm) in control.

Fresh and dry weight was maximum (0.269, 0.036) in *A*<sub>i</sub>*flavus* and minimum (0.128, 0.008) in control respectively. Fresh weight of root was recorded maximum (1.004) in *A*<sub>i</sub>*fumigatus* inoculants and minimum (0.070) in *A*<sub>i</sub>*niger* by causing seed rotting and seedling mortality. *Aspergillus niger* showed minimum effect on seed germination and seedling growth *A*<sub>i</sub>*flavus* was pathogenic causing seed rotting and seedling mortality.

Loss in germinability have been reported by several workers (Kumhar *et al.*, 1987; Mehrotra *et al.*, 1992; Mondal *et al.*, 1981). By the association of different fungi both pathogenic and bioagent inoculated vigour index has been calculated Nayak *et al.*, (2001).

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