



**BIOCHEMICAL AND MOLECULAR CHANGES IN GENETICALLY  
MODIFIED SORGHUM CULTIVARS TREATED WITH  
FUNGICIDES**

*MRP (S) -0153/12-13/KAMY008/UGC-SWRO, Dated:  
29/03/2013)*

**A Minor Research Project Report submitted**

**To**

**University Grants Commission,**

South Western Regional Office,

PK Block, Palace Road, Gandhinagar,

Bangalore-560009

**By**

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## Certificate

*This is to certify that the minor research project entitled "BIOCHEMICAL AND MOLECULAR CHANGES IN GENETICALLY MODIFIED SORGHUM CULTIVARS TREATED WITH FUNGICIDES" (UGC approval letter No. and Date: (MRP(S)-0153/12-13/KAMY008/UGC-SWRO, Dated: 29/03/2013) submitted by Mr. Avinash, V.S, Assistant Professor, Department of Biotechnology, SBRR Mahajana First Grade College, Mysore – 12 to University Grants Commission, South Western Regional Office, PK Block, Palace Road, Gandhinagar, Bangalore-560009, during 2013-2017.*

*I further certify that the present embodied work here presented is original and carried out according to the plan in the proposal and guidelines of the University Grants Commission.*

K.V.Prabhakara

## Declaration

*I, Mr. Avinash, V.S, Assistant Professor, Department Of Biotechnology, SBRR Mahajana First Grade College, Mysore – 12 hereby declare that the Minor Research Project Report entitled “BIOCHEMICAL AND MOLECULAR CHANGES IN GENETICALLY MODIFIED SORGHUM CULTIVARS TREATED WITH FUNGICIDES”(MRP(S)-0153/12-13/KAMY008/UGC-SWRO, Dt: 9/03/2013) submitted by me to University Grants Commission, South Western Regional Office, PK Block, Palace Road, Gandhinagar, Bangalore-560009, during 2013-2017 is the result of the bonafied research work.*

*I further declare that the results here presented are original and carried out according to the plan in the proposal and guidelines of the University Grants Commission.*

*(Mr. Avinash, V.S.)*

## **Executive summary**

The fungicides are the agents which are used to effectively control the plant diseases caused by fungus. The fungal spores can enter the host before the seed is transferred to the soil for germination or can enter the host at the time of harvesting. The control of fungal growth can be arrested by applying certain agents like fungicides as a way of seed dressing or soaking the seeds in fungicide at specific concentrations which can be beneficial to the plants. The primed seeds were allowed to germinate and morphological and biochemical parameters were analysed to understand the effect of fungicide on the metabolism of the seeds. The present study uses two Sorghum varieties and a fungicide which is known to be broad spectrum in nature. The findings of the study were subjected to statistical analysis which helps to arrive at precise conclusions.

A broad spectrum fungicide like Carbendazim was used as a seed priming agent. The seeds were treated with fungicide at recommended dosage for 24 hrs and allowed to germinate using paper towel method. After 10 days of germination various Morphological and Biochemical parameters were tested to understand the phytotoxicity of fungicide and the effect of fungicide on the growth of the plants. The results thus obtained were subjected to various statistical packages which explain the impact of fungicide on the metabolism. The t test determines the relatedness between two parameters and explains the level of significance as significant, very significant and extremely statistically significant. This will give levels for 2 parameters, so the data was subjected to one way ANOVA which compares the means up to 5 concentrations. The concentration range selected for the data was 5 so it explains the effect of fungicide efficiently. Later the relation between the parameters was tested using Correlation and other parameters which explains the overall effect of fungicide on the growth of the plant. It was noted that Ajeet seeds did not had high percent of phytotoxicity, where as Jaikisaan had slight high impact. Protein content and phenolics are the other two parameters which can be used to understand the probable effect of fungicide on the plants.

Garett ranking is a technique which is used to rank the parameters tested based on their effect at various concentrations. Both the seeds showed some parameters like percentage of

phytotoxicity. Tolerance index, protein content starch content and amylase activity at higher ranks which can be assumed as controlling parameters in the present study.

It can be concluded that the broad spectrum fungicide carbendazim can be used for Sorghum at the concentration range of 2000ppm of seeds which is recommended and even at a concentration of 1000 ppm can be beneficial for certain varieties of the crops tested. There is a scope for the study to understand the enzymatic effects over fungicide.