INTRODUCTION

In order to overcome the crop losses due to various pests use of plants with genetically modified characters has become trend in modern agriculturing. Among such plants Bt cotton development by Mahyco seeds containing the Bt Bollgard Bt gene, cry 1Ac, licensed from Monsanto was approved by Government of India for commercial cultivation in March 2002. This approval preceded by a large number of laboratory studies and about 500 field trials carried out during 1996-2001 to demonstrate the safety and benefits of Bt cotton as per regulatory requirements.

Cotton is an important cash crop in India and plays a significant role in national economy. It is clear from literature that similar to cotton nearly 50 such genetically modified crops have been accepted significantly by large number of growers.

Bt cotton with Bt toxin gene oriented from a bacterium *Bacillus thurengensis* was successfully incorporated in cotton hence it is called as Bt cotton. With the incorporation of this gene the pest problem specially the insects on cotton is nearly vanished.

It was interesting to accept this new way of ecofriendly and economically feasible control of pests but however such plants whether
these are safe for microbes including fungi, bacteria and viruses growing in association with these plants i.e. rhizosphere and phyllosphere areas. Considering these facts the present topic was selected to find out the effect of biochemicals both intracellular (sap) as well as extra cellular (exudates) of Bt cotton. The effect on behavior of microbes in general and fungi in particular has been concentrated in detail.

For this seeds of Bt cotton varieties NECH-2R BT, NECH-3R BT, and non Bt cotton varieties NECH-2R non Bt, NECH-3R non Bt were donated by Nath biotechnologies, Aurangabad and varieties like Rashi-2, Bollgard both Bt and non Bt varieties were purchased from local market were employed for studies. The seeds were sown in pots with natural microflora available in the soil and the impact of seedlings and root exudates at different age was seen on qualitative and quantitative analysis of rhizosphere mycoflora and similarly phyllosphere mycoflora associated on root and leaves respectively.

It is clear from the study that mycoflora both in phyllosphere as well as rhizosphere is found to be variable with different cotton varieties. Similarly, the mycoflora when it is compared with non Bt cotton was also found to be quantitatively variable. The fungi mainly isolated from rhizosphere are identified as *Aspergillus niger, Aspergillus flavus, Trichoderma viride, Fusarium roseum, Fusarium moniliformae, Fusarium oxysporum, Rhizoctonia solani, Nigrospora oryzae, Cladosporium spp, Phoma exigua, Alternaria alternata, Rhizopus oryzae and Curvularia
lunata etc. Whereas fungi from phyllosphere category identified as *Alternaria alternata*, *Alternaria macrospora*, *Curvularia lunata*, *verticillium* spp., *Fusarium oxysporum*, *Colletotrichum gossypii*, *Penicillium notatum*, *Helminthosporium gosypii*, *Drechslera tetramera* and *Myrothecium roridum* etc.

The results on effect of exudates and extracts from Bt cotton on growth, population and other behavior of fungi was found significant. The pathogenicity experiment provides that non Bt cotton are more susceptible than Bt cotton varieties to a great extent. Similarly, the growth of fungi was found to be suppressed in the extract of Bt cotton varieties as compared to non Bt cotton varieties. The studies on antibacterial activity of root exudates were carried out and found that Rhizobium species were inhibited more with Bt cotton than non Bt cotton.

In the studies on antifungal activities of leaves, roots and stem extracts of Bt cotton and non Bt cotton varieties against fungi like *Alternaria alternata*, *Fusarium oxysporum*, *Rhizoctonia* spp. and *Trichoderma viride* proved that the extracts of Bt cotton suppressed significant sporulation. Antagonistic activities of plant pathogenic fungi of cotton were tested against non pathogenic fungi. Results showed higher inhibition of plant pathogenic fungi.

The effect of exudates on seed germination of cereals and oil seeds are found to be highly interesting and encouraging.
In the last biochemical analysis of leaf extract and root extract were carried for the parameters like phenol, tannin, and chlorophyll. Results showed higher percentage of all parameters in Bt cotton than in non-Bt cotton.