



Research Paper

**CONIDIAL GERMINATION VARIABILITY OF *Colletotrichum graminicola*
ISOLATED ON PHYLLOPLANE OF SUGARCANE IN GONDIA DISTRICT
(M.S.)**

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Abstract

In plant pathology, morphology of conidial germination is important phenomenon in relation to understand the pathogenicity of fungal organisms. Morphology and anatomy of host leaf as a phylloplane habitat and environmental factor are also important for the conidial germination. Present study carried on performance of conidial germination morphology of *Colletotrichum graminicola* causing anthracnose disease to sugarcane crop. This is destructive disease also causes to other annual grasses. In cultural study, conidial germ tube shows variations in their length after one day interval. Very interesting variability are seen in nature of *C. graminicola* germ tube.

Key words: *Sugarcane*, *phylloplane*, *Colletotrichum graminicola*, *conidial germination*.

INTRODUCTION

Sugarcane is most importance cash crop of Gondia district. This was traditional crop in very little area of Gondia for jagerry production. Now area is increasing regularly under sugarcane cultivation at commercial level for sugar production. Anthracnose is introduced as new disease in area and too much popular in all over world. The identification and morphology of conidial germination variability in *C. graminicola* will be useful for future study. The word anthracnose comes from the Greek word "anthrax". Conidium is a single cell gives mycelium during germination and grows in colonial form. It produce fluffy or suppressed pinkish colony. Conidia have vacuoles and granularly pigment. Vacuoles are present in hyphae, conidia and appressoria of different size in various fungi [1].

MATERIALS & METHODS:

Inoculation:

Anthracnose infected leaves collected from sugarcane field and cut into to 2 cm sized pieces. Pieces of leaves washed with tap water and then transfer in 0.1% mercuric chloride (HgCl₂) for sterilization. Leaf pieces transferred into flask containing 100 ml sterile distilled water after sterilization and washed serially for 5 - 6 times with changing sterile distilled water in aseptic

condition. These small leaf pieces about 2 cm long were transferred on sterile filter paper to make blot dried for inoculation.

Isolation and culture of fungi:

Washed and marked dried leaf pieces transferred on to surface of culture media (Zapak Agar Dox) in petri dished. Culture was incubated at room temperature $25 \pm 2^\circ\text{C}$ for 9 days. Fungal colony was observed after 1 day interval for morphology of conidial germination.

RESULTS AND DISCUSSION:

In present study *Colletotrichum graminicola* shows fast growth and submerged in media. Germination variability shows different growth rate of germ tube and changing the size of colony. Culture of *C. graminicola* grows regularly as well as conidial mycelia and conidial germination tube express variation day by day till up to 9 day. Conidial vacuoles enlarged during germination. Radial mycelia growth, germination of conidia, morphological variability of conidia shows in plates.

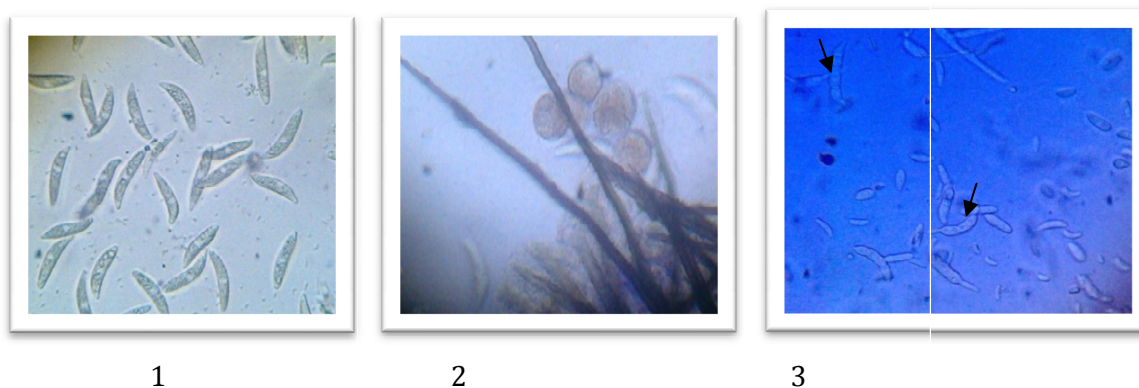
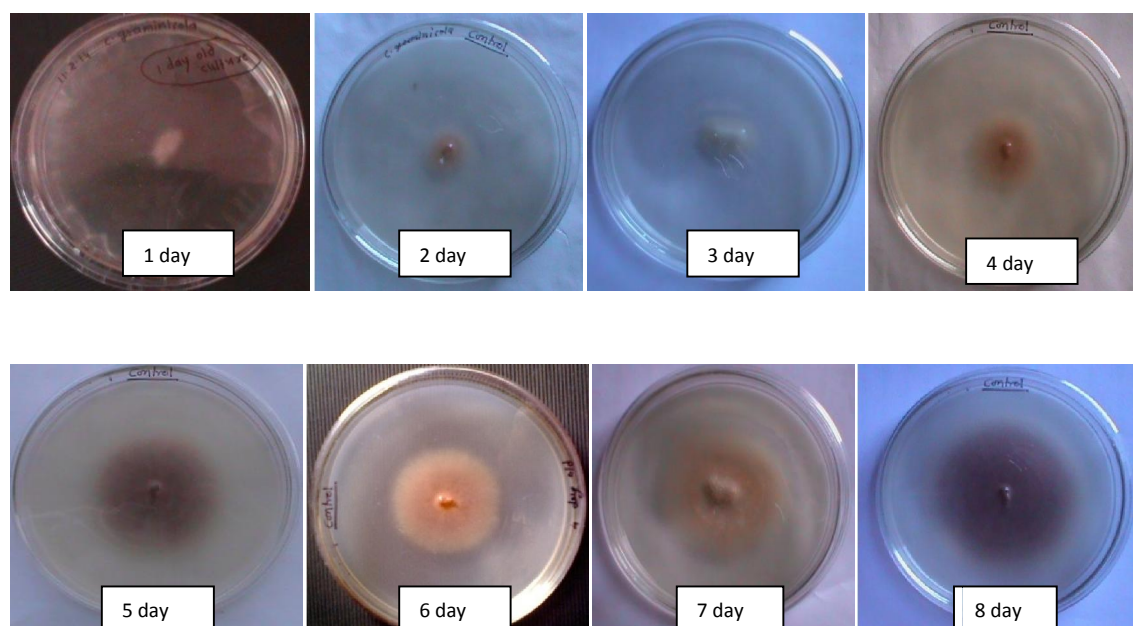


Figure 1: Conidia of *C. graminicola*

Figure 2: Setae of *C. graminicola*

Figure 3: Morphological variability of germination in conidia.

Conidia are hyaline to pale pinkish, falcate to fusiform, tapered toward both ends. Conidial and colony morphology was observed by using 1 to 9 day old culture of *C. graminicola*.



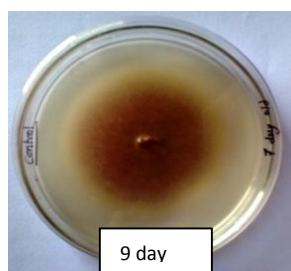


Figure 1-9: Colonial variation of *C. graminicola* from one to nine day old culture.

Conidial germination seen the both end as well as middle and one end of conidia. During observation of germ tubes, germination variability shows in conidia of *C. graminicola*.



Fig1. Germination at one end

Fig2. Germination at both ends

Fig3. Germination at middle part

Present study shows conidial germination variability. Conidia shows change in size of germ tube day by day after germination. Conidial germ tube was getting long after one successive day. The fungus *C. graminicola* was grown at 22°C under constant fluorescent light on oatmeal agar to induce sporulation [2]. Present work agrees with above finding. Randomly conidial germination occurs on one end of conidia, on both ends of conidia and on middle part of conidia. Conidial germination process is very complex and acervulus produces on the leaf surface. Conidium scatters inside of leaf by wind and rain. Acervulus found with many setae, single cell conidia, hyaline and falcate to fusiform. Granular material of conidia partially divided into two parts. When conidial germ tube get outside that time conidial outer layer was rupture. Germ tubes and hyphae of *C. graminicola* did not show orientation toward root-cap cells and contact between hyphae and root-cap cells appeared random [3]. The percentage of germinated spores which formed an appressorium was reduced at incubation temperatures when the spore suspensions were incubated for 24 above 27 °C. Appressorium formation also was reduced when conidia were exposed, in culture or in suspension, to 35 °C for short periods. Similarly, germination was reduced with heat exposure, but at longer exposures than those necessary to reduce appressorium formation [1].

CONCLUSION

Present study explains the conidial germination growth of germ tube. Conidia germinate by middle part and both end of conidia. Conidial germ tube shows variability from first day to last days. Various changes occur in conidia like increasing size of conidia of *C. graminicola*. Hence radial growth of colony and germ tube shows variability after one successive day.

REFERENCES

1. B. R. Miehle, F. L. Lukezic (1972) Studies on conidial germination and appressorium formation by *Colletotrichum trifolii* Bain & Essary. *Canadian Journal of Microbiology*, 18(8) : 1263-1269.
2. Ruth Janice Guse Schadeck, Macro Antonia Ferreira Randi, Dorly de Freitas Buchi, Breno Leite (2003) Vascular system of ungerminate *Colletotrichum graminicola* conidia convergence of autophagic and endocytic pathways. *Microbiology Letters*, 218(2) : 277-283.
3. Sherwood, R. T. (1987) Papilla formation in corn root-cap cells and leaves inoculated with *Colletotrichum graminicola*. *Phytopathology*, 77: 930-934.