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# Evaluation of Fungal Endophytes for Cellulolytic Enzyme Production Isolated from Medicinal Plants of Tumakuru, Karnataka

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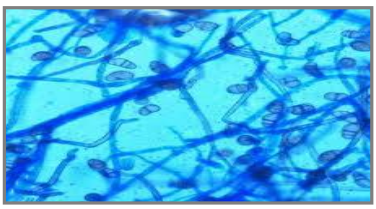
## ABSTRACT

*Cellulose is a polysaccharide composed of several glucose units linked together by chemical bonds. Cellulases, such as endoglucanases, beta-glucosidase and exoglucanases break the chemical bonds between the glucose units. Fungi, including the endophytic species, can be great cellulase producers. This study aimed to evaluate cellulase production by four endophytic fungi isolated from medicinal plants locally available around Tumakuru region. The isolation of endophytic fungi was carried from leaf, stem and roots tissues using Potato dextrose agar( PDA) 2.5% supplemented with the antibiotic streptomycin sulphate (100 mg $L^{-1}$). The fungal isolates were identified based on colony morphology and microscopic features as Alternaria from the leaf of Ocimum basilicum and Fusarium on root tissue and Ocimum sanctum leaf showed Fusarium and root isolate was Penicillium and no isolate from stem was observed. Finally leaf of Leucas aspera showed Alternaria and root isolate showed Curvularia. The cellulolytic capacity of the fungi was screened on solid agar with cellulose as the substrate using Congo red as an indicator dye. The most potent fungus that degrades cellulose was Peniciliumsps isolated from root of the Ocimum basilicum followed by Curvulariasps isolated from root of Leucas aspera. Quantitative estimation was carried out by DNS method. Maximum cellulase activity was by Curvulariasps, followed by Pencilliumsps, Alternariasps showing moderate activity and Fusariumsps showed low activity. The results from the present study reveals that Peniciliumsps and Curvulariasps are extremely potent producers of cellulases and can thus be used for eco-friendly and economic hydrolysis of biomass for biofuel production.*

## Graphical Abstract



Microscopic view of the endophytic fungi.

**Keywords:** Cellulose, Endophytic fungi, *Ocimum basilicum*,*Ocimum sanctum*, *Leucasaspera*, Cellulolytic activity.