

**Effects of Secondary Metabolites of Some Yeasts on *Colletotrichum musae* and Anthracnose Disease on  
Bananas cv. Hom Thong**

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**Abstract**

This study concerns the metabolites from two yeasts *Aureobasidium pullulans* TISTR 3389 and *Candida utilis* on controlling and induced resistance to anthracnose disease of bananas. Yeast metabolites had an effect on the reduction of banana anthracnose and capability of induction of diseased resistance. Metabolites from yeasts directly affected on the growth of *Colletotrichum musae* by producing hydrolytic enzymes;  $\beta$ -1,3-glucanase and chitinase. Volatile metabolites from these yeasts also directly reduced the pathogen growth. Whereas the increase in the activities of defensive enzymes; phenylalanine ammonia-lyase (PAL),  $\beta$ -1,3-glucanase and chitinase in peel tissues after application with both yeast metabolites was shown indirect effect on the disease development. PAL protein was rapidly accumulated at 0 h after treatment as well as PAL mRNA expression was observed.  $\beta$ -1,3-glucanase activity was enhanced starting from 48 h after treatment, but mRNA level was expressed at 0 h. Whereas chitinase activity was induced at 72 h after treatment, but the expression of mRNA level was not observed in all duration of storage time. An antifungal compound, 3-(2-hydroxyethyl)-indole or tryptophol, which contained in yeast culture filtrates also directly inhibited *C. musae* growth, and probably acted as signal molecule for defense mechanisms in banana tissues. Thus, the ability of two yeasts to produce antifungal compounds, cell wall degrading enzymes and volatile secondary metabolites, subsequently to enhance the defense response in banana tissues have contributed the increased control levels of banana anthracnose.

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