

## Physiological Insight into an Age Old Biocontrol Practice in Banana Cultivation

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**Abstract :** 'Malbhog', an indigenous banana variety, much prized for its flavour and delicacy suffers production losses due to *Fusarium oxysporum* f.sp. cubense. The pathogen enters young plants through feeder roots causing wilting of plants ultimately leading to death of plants. The pathogen spreads rapidly to other plants in the field. In eastern part of India, this variety escapes the onslaught of the pathogen when either co-cultivated or rotated with *Amorphophallus campanulatus* (yam). The present study provides an insight into the physiological aspect of the biocontrol by yam. In vitro application of sterile aqueous extract of yam tuber (100gm/100ml distilled water and its 1:10 and 1:100 dilutions) were mixed with PDA media which was substantially inoculated with spores of *Fusarium oxysporum* f.sp. cubense. The extract could significantly reduce germination of pathogen spores. Banana variety susceptible to *Fusarium* sp was raised in soil rite under aseptic conditions. Spores of the pathogen (106 spores/ml) were inoculated into the soil rite. The plants were spread with aqueous extract of yam. The control plants were treated with sterilized distilled water. The activity of phenylalanine ammonia lyase (PAL), polyphenol oxidase (PPO) and peroxidase (POX) were estimated in leaves and roots at interval of 24 hours for 5 days after treatment. The incidence of wilt disease was recorded after two weeks. The results demonstrated that yam extract could induce significant activity of PAL, PPO and POX along with accumulation of phenols in both roots and leaves of banana plants. However, significantly high activity of enzymes and phenol accumulation was observed in roots. The disease incidence was significantly low in yam treated plants. The results clearly demonstrated the control of the pathogen due to induction of defense mechanism in the host by the extract. The observed control of the pathogen in the field could possibly be due to induction of such defense responses in host by exudates leached into the soil from yam tubers. Yam extract could be a potential source of environment-friendly biocide against Panama wilt of banana.

**Keywords :** *Amorphophallus campanulatus*, banana, *Fusarium oxysporum* f.sp. cubense, phenylalanine ammonia lyase (PAL), polyphenol oxidase (PPO), peroxidase (POX)

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