

ABSTRACT

Fungi associated with yam (*Dioscorea* spp.) tubers after harvest and their interactive effects on rot development

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A study was carried out to determine the postharvest fungi associated with decaying *Dioscorea alata*, *D. cayenensis* and *D. rotundata* tubers and *Colocasia esculenta* corms in Jamaica and to assess the ability of selected fungi and bacteria to inhibit the two major fungal pathogens isolated. Six, 21, seven and nine species of fungi were isolated from *D. alata*, *D. cayenensis*, *D. rotundata* and *C. esculenta*, respectively. *Penicillium expansum* occurred most frequently and was isolated from more than 74% of the tubers of each yam species.

The pathogenic species included *Aspergillus flavus*, *Aspergillus niger*, *Fusarium graminearum*, *Fusarium solani*, *Lasiodiplodia theobromae*, *P. expansum* and *Penicillium oxalicum*. *P. expansum* and *P. oxalicum* were the fungi that were most pathogenic on yam tubers.

The yam species varied in their susceptibility to *P. expansum* and *P. oxalicum* with *D. alata*, *D. cayenensis* cv. Blackwiss and *D. rotundata*-*cayenensis* being more susceptible than the other species: *D. rotundata* was the least susceptible. *C. esculenta* was susceptible to *P. oxalicum* but not to *P. expansum*.

Inoculating tubers with *Penicillium* spp. at various sections or at various times after wounding or storing at various temperatures influenced the degree of rotting.

Histological studies showed that the hyphae of both *Penicillium* spp. penetrated parenchymatous cell walls and entered the lumen before cell degradation occurred.

Several fungal and bacterial isolates, including *Cladosporium cladosporoides*, *Penicillium sclerotiorum*, *Pyrenochaeta terrestris*, *Trichoderma koningii*, *Pseudomonas fluorescens*, *Bacillus lentimorbus* and *Paenibacillus polymyxa* were inhibitory to the growth of *P. expansum* and *P. oxalicum* *in vitro*. When 'Roundleaf' tubers were treated with conidial suspensions of *T. koningii* prior to inoculating with *P. expansum*, the rots were less deep than those of the control. Rot sizes were similar for *P. expansum*-inoculated tubers treated with crude extracts of the inhibitory fungi and for the controls.