POSTER SUMMARY

ATTRACTION OF *ELDANA SACCHARINA* (LEPIDOPTERA: PYRALIDEA) TO CERTAIN *FUSARIUM* ISOLATES IN OLFACTORY CHOICE ASSAYS

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Abstract

In olfactory choice assays using maize kernels inoculated with a range of *Fusarium* isolates, *Eldana saccharina* larvae showed a marked preference for certain isolates while avoiding others. Larvae that were found feeding on some inoculated kernels were noticeably larger than those feeding on the uninoculated controls.

Keywords: sugarcane, *Eldana saccharina*, *Fusarium*, olfactory choice assays

Introduction

Certain *Fusarium* species (e.g. *F. verticillioides*) produce a range of volatiles, including small alcohols, esters and aldehydes that are known to be attractive to some insects (Bartelt and Wicklow, 1999). These volatiles are thought to increase the likelihood of fungi being vectored by insects to their hosts. Cardwell *et al.* (2000) and Schulthess *et al.* (2002) reported increased damage by *Eldana saccharina* Walker (Lepidoptera: Pyralidae) in maize that was infected with *F. verticillioides.* They postulated that maize infected with the fungus was more attractive to *E. saccharina* moths and more conducive to the survival and development of *E. saccharina* larvae. Laboratory assays have shown that *Fusarium* species isolated from sugarcane can affect the development of *E. saccharina* larvae positively or negatively when incorporated into a diet mix (McFarlane and Rutherford, 2005). As an extension to this study, the ability of these *Fusarium* sp. to attract *E. saccharina* larvae to infected tissue was investigated and the results are discussed in this poster.

Materials and methods

Moist maize kernels were autoclaved (121ºC for 15 minutes) and inoculated with isolates of *Fusarium sacchari, F. pseudonygamai* and *F. proliferatum* recovered from sugarcane. These were incubated in the dark at room temperature for three weeks. In assay 1, three drawing pins were pushed through the lids of 90 mm petri dishes, equidistant from each other, and the lids were lined with moistened filter paper. An inoculated maize kernel was placed on each drawing pin; uninoculated kernels served as the controls. Twenty-first instar *E. saccharina* larvae were released in the middle of each petri dish. The dishes were sealed and placed in the dark at room temperature. The assay was replicated six times. After 48 hours, the number of larvae feeding on each kernel was recorded. In assay 2, square petri dishes were used and four *Fusarium*-inoculated kernels were pinned in the corners of each dish. No uninoculated control was used. Assay 2 was replicated nine times.

Results and discussion

In assay 1, significantly more larvae (P<0,001) were recovered from kernels inoculated with two isolates of *F. pseudonygamai* (SC17 and ZS36ai) compared with other treatments (Figure 1). The larvae feeding on these kernels were also visibly larger than those recovered from the other treatments.

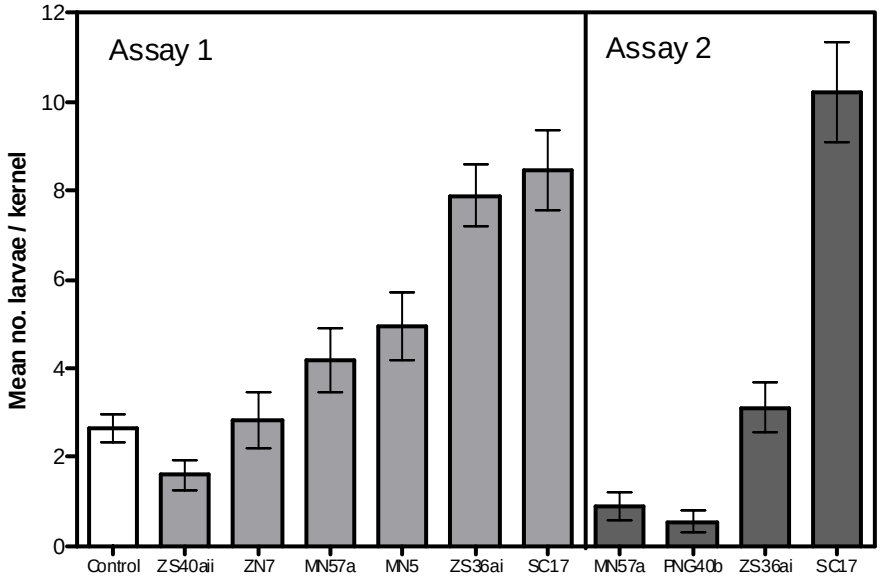

Figure 1. Mean number of *Eldana saccharina* Walker (Lepidoptera: Pyralidae) larvae recovered from maize kernels inoculated with *Fusarium* species in two Petri dish assays (ZS40aii, MN57a and PNG40b = *F. sacchari*; MN5 = *F. proliferatum*; ZN7, ZS36ai and SC17 = *F. pseudonygamai*).

In assay 2, one isolate of *F. pseudonygamai* (SC17), one of the most beneficial isolates to *E. saccharina* development in diet assays, was significantly more attractive than the other three isolates, including ZS36ai. Two *F. sacchari* isolates (ZS40aii and PNG40b) appeared to repel *E. saccharina* larvae. These isolates were detrimental to the development of *E. saccharina* in diet assays.

These results suggest that certain *Fusarium* isolates produce compounds that are distinctly attractive to *E. saccharina* larvae and beneficial to their development, while other isolates seem to produce volatiles that repel *E, saccharina* and, at the same time, produce toxins that are detrimental to *E. saccharina* development.

Potential benefits

As a short term measure to protect sugarcane against extensive *E. saccharina* damage, seedcane could be hot water treated and dipped in fungicides to eliminate fusaria such as *F. pseudonygamai* that are attractive to *E. saccharina* and beneficial to their development. A long-term strategy could include breeding for varietal resistance to *Fusarium*. Alternatively, facilitating endophytic colonisation by antagonistic fusaria could protect sugarcane from *E. saccharina* damage and may even restrict colonisation by other beneficial *Fusarium* species.

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