

Benzoxazinoid metabolism by entomopathogenic nematodes

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Benzoxazinoids are plant specialized metabolites produced by cereals, like maize and wheat. The Western corn rootworm (WCR, *Diabrotica virgifera virgifera*), a specialist root herbivore, sequesters benzoxazinoids and uses them against its natural enemies, entomopathogenic nematodes (EPNs). Yet, how EPNs cope with the sequestered benzoxazinoids remains unknown. Here we investigated whether and how EPNs metabolize HDMBOA-Glc. We found that different strains of EPNs, originating from Europe and the US, have evolved metabolism strategy to cope with the chemical. All 12 strains deglycosylated the compound, resulting in the accumulation of the toxic MBOA aglucone. Surprisingly, the metabolism path employed by the different strains did not correlate with their survival and infectivity success. We discuss possible nematode adaptations to benzoxazinoid sequestration by their host and the relevance for developing EPN breeding programs for sustainable agriculture.