Characterization of maize plants response to entomopathogenic nematodes

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Multitrophic interactions between plants, herbivores, and the enemies of the herbivores are key drivers of ecosystem functioning and biodiversity. While many of these interactions have been well described, whether plants can perceive and respond directly to herbivore enemies remains unclear. Here, we investigated how maize plants respond locally and systemically to the presence of entomopathogenic nematodes (EPNs) in soil. By combining metabolomics and transcriptomic analyses, we demonstrate that maize plants can detect EPNs, resulting in a shift in the primary metabolism in leaves and roots. In particular, soluble sugar profiles show drastic changes in plants exposed to EPNs. We discuss why plants may have evolved the ability to perceive the enemies of its enemies and its relevance for fundamental and applied biology.