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## The Evil Genius of the Brassica Genus: an investigation of the chemical cross-talk between *Aspergillus nidulans* and non-host seeds

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The Evil Genius of the Brassica Genus: an investigation of the chemical cross-talk between  
Aspergillus nidulans and non-host seeds

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*(This is a Senior Project placeholder abstract for a project scheduled to be submitted for publication elsewhere. This CEDAR listing will be updated with a link to the project research when it is eventually published.)*

Aspergillus is a widespread saprophytic fungus that contaminates important grain and seed crops postharvest. Many different plants within the Brassicaceae family, and within the Brassica genus more specifically, are known to produce a variety of antimicrobial volatile defense chemicals. Three Brassica plants- Arabidopsis thaliana, Novantina (cultivar of Brassica rapa), and Tatsoi (cultivar of Brassica rapa)- were incubated with Aspergillus nidulans spores in an experimental test chamber. The test chambers were created by fitting together two GMM agar plates and sealing them with microporous surgical tape, so headspace gases were shared between the plates but gaseous exchange with the ambient environment was limited. Bottom plates were inoculated with seed extract treatments and top plates were inoculated with A. nidulans spores. The concentration of A. nidulans spores on the top plate after a 40-hour incubation period was measured. Inhibition of A. nidulans growth and sporulation was observed in treatments where the bottom plate was inoculated with both seed extract and A. nidulans spores, suggesting that inhibition occurred as a “shadow effect” wherein the inhibition of sporulation and growth by spores on the top plate was a response to volatile organic compounds (VOCs) released by spores on the bottom plates. The VOCs released by bottom plate spores were themselves responses to VOCs released by seed extract. Hence, the chemical communication from seed extract to spores was hypothetically a multistep process where the final message was passed on through an intermediary, much like how a shadow resembles the object which casts it but is created by light hitting an intermediary (the object) first. Characterization of the antifungal volatile organic compounds could lead to the development of effective strategies for mitigating Aspergillus infection of crops postharvest, such as by fumigation of grains and seeds with the antifungal chemical compound.