

Integration of invasive tree, black locust, into agro-ecological flower visitor networks induces competition for pollination services

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Abstract

Invasion of ecosystems by alien species is a global concern. *Robinia pseudoacacia* L. (Fabaceae) is one such species which impacts on native diversity and ecosystem functioning. We assessed how *R. pseudoacacia* affects flower visitation by arthropods in commercial apple orchards in eastern Free State, South Africa. We used paired observations to compare the abundance and diversity of flower visitors and their interactions with the two plant species. Our results showed that *R. pseudoacacia* flowers attract African honey bees (*Apis mellifera*) more than apple flowers. However, flower visitation by Diptera, particularly March flies (Bibionidae) was higher in apple flowers. Arthropods of other orders appeared to be minor visitors for both plants as they were recorded in small numbers. Flower visitation rates by *A. mellifera* did not vary significantly between the two plant species, though it was marginally higher in *R. pseudoacacia*. The interaction network for the two plant species and their flower visitors showed high nestedness indicating that they are drawing from the same pool of pollinators. Therefore, there is competition for flower visitors between *R. pseudoacacia* and apples based on the number of shared partners, an interaction which may potentially affect apple pollination and ultimately compromise fruit quality and yields. These findings further support the need to sustainably manage *R. pseudoacacia* in all invaded habitats including agro-ecosystems.