

Do plants perform best with family or strangers? Researchers consider social interactions

November 9 2011



Plantain seedlings used in an experiment

In the fight for survival, plants are capable of complex social behaviours and may exhibit altruism towards family members, but aggressively compete with strangers.

A growing body of work suggests plants recognize and respond to the presence and identity of their neighbours. But can plants cooperate with their relatives? While some studies have shown that [siblings](#) perform best -- suggesting [altruism](#) towards relatives -- other studies have shown that when less related plants grow together the group can actually outperform siblings. This implies the group benefits from its diversity by

dividing precious resources effectively and competing less.

A team from McMaster University suggests plants can benefit from both altruism and biodiversity but when these processes occur at the same time, it is difficult to predict the outcome.

"The greatest challenge for understanding plant social interactions is we can't interpret plant behaviours as easily as we do those of animals," explains Susan Dudley, an associate professor in the Department of Biology at McMaster. "Though we have shown plants change traits in the presence of relatives, we need to determine if this is cooperation. Linking the plant behaviours with their benefits is challenging when multiple processes co-occur."



Iris flowers showing a population of interacting plants

Dudley and a team of researchers disentangle the sometimes contradictory research in the latest edition of the [Proceedings of the Royal Society B](#), describing how the identity and presence of [neighbours](#) affect many processes acting on [plant populations](#).

The problem, she says, is that plant social interactions are treated as a black box, with researchers only looking at the output, or the fitness of the plant, in sibling competition. But they need to investigate the mechanisms inside the box -- by describing how traits of individuals affect fitness -- to understand how the output is reached and which mechanisms are occurring to get there.

"Simply put, [social environment](#) matters to plants. If we first acknowledge that kin cooperation and resource partitioning are co-occurring, we can begin to address some very important questions," says Amanda File, a graduate student in the Department of Biology at McMaster.

"Among these questions is whether there is a link between kin recognition and plant performance, whether plant kin recognition can improve crop yield and how kin recognition shapes communities and ecosystems" says Guillermo Murphy, a graduate student in the Department of Biology at McMaster.

More information: [rspb.royalsocietypublishing.org ...
11/03/rspb.2011.1995](https://rspb.royalsocietypublishing.org/doi/10.1098/rspb.2011.1995)

Provided by McMaster University

Citation: Do plants perform best with family or strangers? Researchers consider social interactions (2011, November 9) retrieved 26 April 2024 from <https://phys.org/news/2011-11-family-strangers-social-interactions.html>

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