

# In the war between the sexes, the one with the closest fungal relationship wins

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The war between the sexes has been fought on many fronts throughout time -- from humans to birds to insects, the animal kingdom is replete with species involved in their own skirmishes. A recent study by Dr. Sarah Eppley and colleagues at Portland State University published in the November issue of the *American Journal of Botany* demonstrates that certain plants, with some help from fungal friends, may also be involved in this fray.

Most flowering plants form symbiotic relationships with *mycorrhizal fungi*. The plants produce food that the fungi need to survive, and the fungi provide several benefits to plants. They may assist the plants in [nutrient uptake](#), provide protection against fungal pathogens that would harm the plants' roots, and improve the soil structure. With the many benefits these *mycorrhizal fungi* provide to plants, they have the potential to play a significant role in shaping plant populations.

Interactions between the plant and the *mycorrhizal fungi* may be influenced by the genetic composition of the plant. This raises the question: for species with separate male and female plants, do interactions with *mycorrhizal fungi* vary between the sexes and consequently play a role in the male/female structure of the population?

"We know that male and female plants often differ in physiology, but little is known about whether the sexes differ in their interactions with other organisms," Eppley noted. "If males and females differ in how they interact with organisms in their community, such as with

*mycorrhizal fungi*, then we expect a cascade of effects within a community."

Eppley and colleagues analyzed mycorrhizal colonization of roots of male and female members of the marsh grass *Distichlis spicata* to determine whether the sex of the plant influences the interaction between the plant and *mycorrhizal fungi*.

In populations of *D. spicata*, males are found almost exclusively in habitats that have a low nutrient concentration and females are found almost exclusively in habitats with a higher nutrient concentration. The relationship between *D. spicata* and *mycorrhizal fungi* is known to have a significant effect on the health and reproduction of the grass. If *D. spicata* exhibits sex-specific interactions with the *mycorrhizal fungi*, this distribution may be due to those interactions.

Eppley and colleagues found differences in mycorrhizal colonization between males and females. Female plants were more likely to be colonized by the *mycorrhizal fungi* than male plants. Although some of the plants they studied had not yet reached reproductive maturity, these immature plants also showed the same pattern of sex-specific colonization.

Intersexual competition has been hypothesized to be a likely cause of the spatial segregation of the sexes in *D. spicata* populations. It may be that the female plants, with the assistance of *mycorrhizal fungi*, are able to out-compete the male plants for the coveted phosphorous-rich sites within the marsh.

"Although intersexual competition in plants has rarely been studied," said Eppley, "understanding the differences in how males and females compete is important because it is likely to play a role in the evolution of population sex ratios."

More information: [www.amjbot.org/cgi/content/full/96/11/1967](http://www.amjbot.org/cgi/content/full/96/11/1967)

Source: American Journal of Botany

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