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NEWS & VIEW

HIGHLIGHTS

A quick glance at noteworthy articles for November 2019

ERICOID MYCORRHIZAE AFFECT FLORAL TRAITS THAT ATTRACT POLLINATORS

The evolution of floral traits is often thought to be driven primarily by pollinators. Yet plants interact with many species simultaneously, and these interactions may, in combination, affect floral traits. Brody et al. investigated the effects of ericoid mycorrhizal fungi on floral traits important to pollinators in nine cultivars of highbush blueberry. For some cultivars, inoculation of roots with fungal spores enhanced floral display size and resulted in differences in flower morphology—traits that are likely to alter plant attractiveness to visiting bees. Their findings demonstrate that specialized fungi enhance flowering and alter investment in plant reproduction in genotype-specific ways, underscoring the importance of examining belowground symbionts to understand drivers of floral traits and interactions with pollinators.

Brody, Alison K., et al. 2019. Genotype-specific effects of ericoid mycorrhizae on floral traits and reproduction in *Vaccinium corymbosum*. *American Journal of Botany* https://doi.org/10.1002/ajb2.1372

RARE MICROBIOME MEMBERS SHAPE PLANT MORPHOLOGY

Microbes that live within plant tissues (i.e., the microbiome) can alter plant morphology and physiology; however, it is unknown how multi-species communities of microbes interact to shape host function. Henning et al. experimentally inoculated root tissue with single-strain bacteria and three-strain communities of closely related bacteria to investigate how small shifts in microbiome communities altered plant morphology and physiology. They found that small changes in the identity of closely related bacterial strains growing at low abundance led to changes in how plants allocated biomass toward leaves, stems, or roots, and those shifts were not predictable from single-microbe trials. These results suggest that even simple microbiome communities can lead to complex interactions within the plant and bacteria living at low abundance can have large effects on plant morphology.

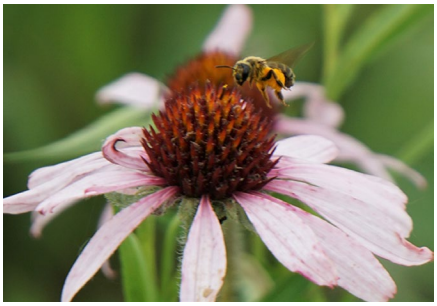
Henning, Jeremiah A., et al. 2019. Relatively rare root endophytic bacteria drive plant resource allocation patterns and tissue nutrient concentration in unpredictable ways. *American Journal of Botany* https://doi.org/10.1002/ajb2.1373

https://doi.org/10.1002/ajb2.1390

HYBRIDIZATION, ECOPHYSIOLOGY, AND INVASIVENESS

Hybridization between two invasive species of South African *Carpobrotus* in Europe may enhance the evolution of invasive capacity. Campoy et al. assessed the extent to which *C. edulis* and the "hybrid swarm" *C.* aff. *acinaciformis* differ in functional traits related to competitive ability and resource-use efficiency when competing under different soil nutrient conditions. They found that *C.* aff. *acinaciformis* showed higher competitive ability and physiological performance than *C. edulis*, supporting the hypothesis that hybrid vigor contributes to invasiveness. Interestingly, *C. edulis* appears more responsive than *C.* aff. *acinaciformis* to incremental change in soil nutrients, suggesting that the expansion of this species could be enhanced with increasing atmospheric nitrogen. Studying existing trade-offs linked to such divergence between these species is necessary to predict future invasion dynamics of *Carpobrotus*. [Photo credit: Josefina G. Campoy]

Campoy, Josefina G., et al. 2019. Ecophysiological differentiation between two invasive species of *Carpobrotus* competing under different nutrient conditions. *American Journal of Botany* https://doi.org/10.1002/ajb2.1382



NATIVE SOLITARY BEES ARE THE MOST EFFECTIVE POLLINATORS FOR POLLEN-LIMITED PURPLE CONEFLOWER

Plants in fragmented habitats often suffer pollen limitation, which can further threaten population persistence. Assessing variation in pollinator effectiveness is critical for understanding reproductive declines due to pollen limitation. Standard measurements of pollinator effectiveness may not be appropriate for plants in the Asteraceae, which have uniovulate florets. By precisely assessing pollen limitation of individual florets, Page et al. quantified effectiveness of six taxa of native bees at pollinating and transporting pollen among purple coneflowers (*Echinacea angustifolia*), a composite occurring in small, isolated populations. They found that a specialist, *Andrena helianthiformis,* was much more effective than all other visitors. Surprisingly, bee behavior on flowering heads did not explain differences in effectiveness, all bees carried genetically diverse conspecific pollen loads, and larger bees did not transport pollen farther than smaller bees. The absence of *A. helianthiformis* in small or isolated patches may contribute to reproductive declines of *Echinacea* in fragmented prairie habitat. [Photo credit: Jennifer L. Ison]

Page, Maureen L., et al. 2019. Pollinator effectiveness in a composite: a specialist bee pollinates more florets but does not move pollen farther than other visitors. *American Journal of Botany* https://doi.org/10.1002/ajb2.1383

SOLAR WIND MAY CUE TROPICAL RAINFOREST TREES TO INCREASE REPRODUCTIVE EFFORT IN ANTICIPATION OF EL NIÑO

Tropical tree reproduction varies considerably year to year, with certain years bringing forth bountiful fruit production and others little at all. Differences in climate among years account for some of this variation, with the El Niño Southern Oscillation usually coinciding with years of high fruit production in wet tropical forests. Whether or how tropical wet forest trees are cued to match reproductive output to El Niño events is not known. Hogan et al. discuss the novel hypothesis that solar wind may cue interannual increases in wet tropical forest reproduction. Although a clear mechanism is still lacking, they show that global solar wind-energy input is highly correlated with the number of species producing flowers or fruit over a 19-year period in a Puerto Rican forest.

Hogan, J. Aaron, et al. 2019. Proposing the solar-wind energy flux hypothesis as a driver of inter-annual variation in tropical tree reproductive effort. *American Journal of Botany* https://doi.org/10.1002/ajb2.1380