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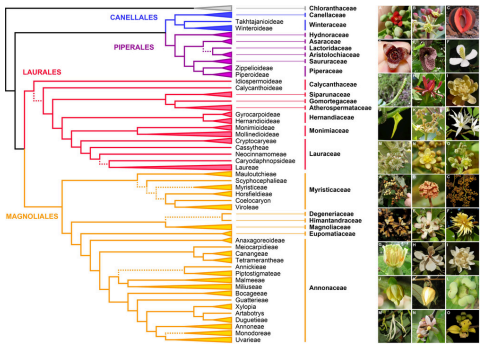
Highlighted Articles for January 2025

Self-sabotage in style: Rapid detection of widespread self-incompatibility in *Lysimachia monelli* (Primulaceae)

Most flowering plants feature hermaphrodite flowers that potentially self-pollinate. **Nevertheless, roughly one half of all of angiosperm species possess a genetic mechanism that prevents self-fertilization, by rejecting all incoming pollen grains that match a specific genomic region of the pistil.** Many such "self-incompatibility" mechanisms exist, but one is particularly widespread. It uses proteins that cleave RNA (S-RNases) to effectively assassinate self-pollen after pollination. **In this paper, Ramanauskas et al. showcase a pioneering approach to rapidly screen the molecular candidates underpinning such mechanisms and apply it in the primrose family (Primulaceae), which is distantly related to lineages where S-RNases have been found previously.** Their results strongly support the hypothesis that the S-RNase mechanism is ancestral in eudicots and that it pre-dates massively convergent occurrences of heterostyly and other self-incompatibility mechanisms. **These results are important for our understanding of the propensity for trait convergence, the causes and consequences of species diversity, as well as in a variety of applications such as plant breeding and conservation.**

Karolis Ramanouskas. 2024. Rapid detection of RNase-based self-incompatibility in *Lysimachia monelli* (Primulaceae). *American Journal of Botany* https://doi.org/10.1002/ajb2.16449

Revisiting the classification of magnoliids using genomics

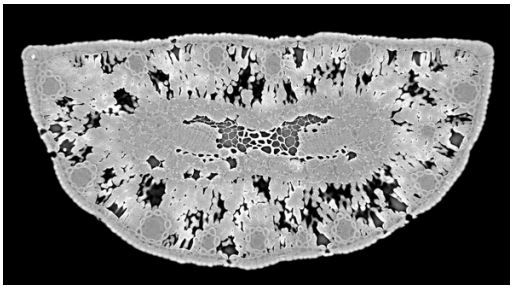


Andrew J. Helmstetter et al. 2024. Toward a phylogenomic classification of magnoliids. *American Journal of Botany* https://doi.org/10.1002/ajb2.16451

Magnoliids are a key piece of the angiosperm evolution puzzle, comprising four orders, about 20 families, and ~12,000 species including numerous cultivated ones such as magnolias, nutmeg, black pepper, cinnamon, and avocado. Although much work has been done over the past few decades to reconstruct their phylogeny, many questions remain, in part due to the limitations of the small number of plastid genes typically used in such studies. **Helmstetter et al. used target sequence capture (with the Angiosperms353 bait set) to revisit phylogenetic relationships among genera and families of magnoliids.** Because phylogenomic datasets present unique challenges, such as low recovery of some genes in some groups, and reconciling numerous individual gene trees into a species tree, they also explored the impact of multiple filtering strategies and analytical choices. Their study confirms many previously established relationships but also suggests new ones, such as the position of the parasitic family Hydnoraceae as sister to the remainder of Piperales. **Combining their new results and previous work, the authors present an updated phylogenetic classification for the whole group, consistent with APG IV at the order and family level (except for Piperales), but also detailing all subfamilies and tribes, including new tribes for Myristicaceae.**

Trees can remember a wetter past

Legacy effects, the long-lasting impacts of past ecological conditions, are more than just impacts of drought. **The novel results of Chin et al. suggest that trees remember past water abundance as well.** Following 11 years of experimental irrigation in a mature forest, Scots pine trees were allowed to revert back to naturally dry control conditions. **A full seven years later, the leaves of trees that once were water-rich remain structurally different from those of never-watered trees or those that have been irrigated continuously, producing small leaves with greater investment in drought and pest resistance at the expense of photosynthetic tissue.** Multivariate analysis of 47 anatomical traits helped uncover a broad strategic difference in leaf structure, suggesting limited productivity. **Such long-lasting legacy effects in organs produced many years post-irrigation suggests that the current crop of mature trees that established in a pre-climate-change world may be primed, to their disadvantage, for wet conditions that will never return.**



Alana R. O. Chin, et al. 2025. The memory of past water abundance shapes trees 7 years later. *American Journal of Botany* https://doi.org/10.1002/ajb2.16452