

Pollen nutrition structures bee and plant community interactions

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Pollinator decline has long been a serious concern for scientists and land managers, and one factor to consider when addressing these declines is pollen nutrition. Pollen is the main source of proteins and fats for bees, and is critical for their development, reproduction, and health. Plant species vary considerably in the nutritional content of



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their pollen, and yet pollen nutrition has not previously been a priority when selecting plants for restoration efforts. This research studies how variation in pollen nutrition shapes the interactions between plants and bees.

The researchers tested how pollen protein and fat content sampled from 109 co-flowering plant species structured visitation patterns observed among 75 subgenera of pollen-collecting bees in the Great Basin/Eastern Sierra region of the U.S. They found that plants with similar nutritional profiles also had similar bee visitor profiles. The research also revealed potential nutritional niches, as bee subgenera and plant subgenera were arranged in distinct and interconnected groups, based around the nutritional profiles of the pollen. Importantly, variation in pollen nutrition alone (high in protein, high in lipid, or balanced) did not predict the diversity of bee visitors, indicating that plant species offering complementary pollen nutrition may be equally valuable in supporting bee diversity.

The results of this study indicate that consideration of pollen macronutrient content can help explain patterns of interactions among wild bees visiting wildflowers to collect pollen, and that nutritional diversity should be a key consideration when selecting plants for habitat restoration. This can help inform plans to restore bee habitat, conserve plant species, and design supplemental plantings for bees in agricultural and urban areas.

Publications

- Anthony D. Vaudo, Lee A. Dyer, Anne S. Leonard. 2024. [Pollen nutrition structures bee and plant community interactions](#)
- Sylvia Kantor, Justin Runyon, Will Glenney, Laura Burkle, Jessie Salix, Don DeLong. 2023. [Of bees and blooms: A new scorecard for selecting pollinator-friendly plants in restoration](#)

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