Contrasting effects of chemodiversity on pollinators and flower-associated bacteria

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Research on floral scent emission has mostly focused on the effects of individual compounds on specific interactions between flowers and other organisms, mostly pollinators. We still lack knowledge about the ecological relevance of chemodiversity[a].

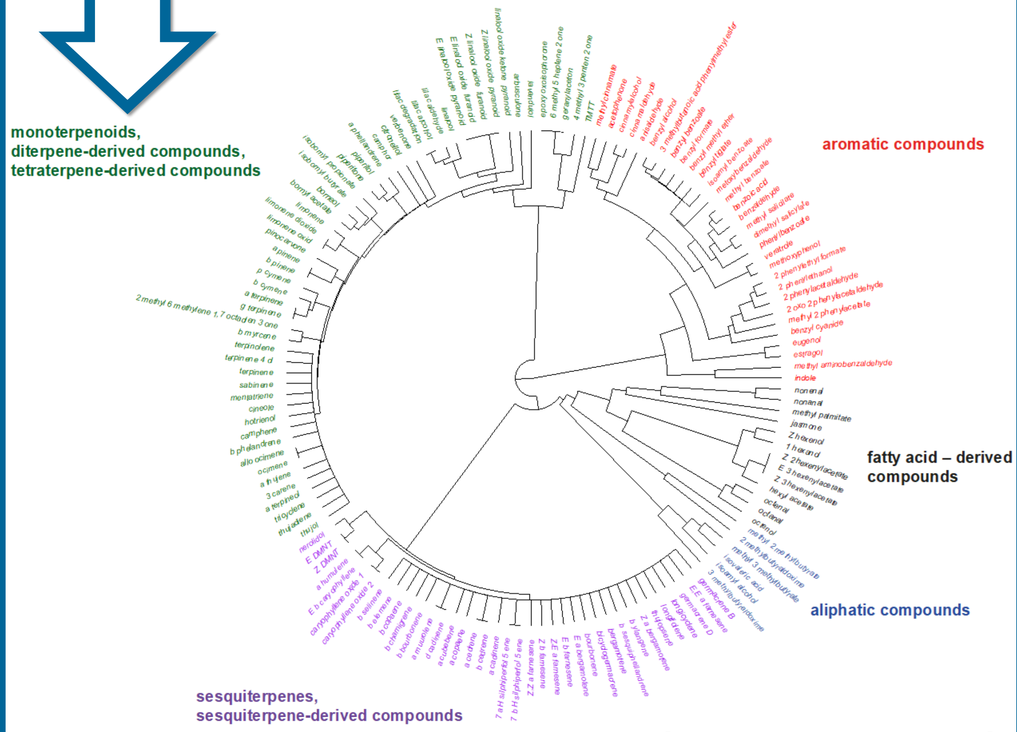
Floral scents are known to structure flower-insect networks[b] and to affect the growth of bacteria[c]. Here we demonstrate that floral scent chemodiversity exhibits contrasting effects on flower-bacteria and flower-visitor associations.

Chemodiversity

Chemodiversity (i.e. the diversity of phytochemical compounds synthesized by a plant organ) represents an important plant traits.

Floral scent compounds are produced by a limited number of biosynthetic pathways and are characterized by different chemical structures. Considering such properties of compounds can be important to account for interdependences due to shared biosynthetic pathways and to estimate the function of phytochemicals.

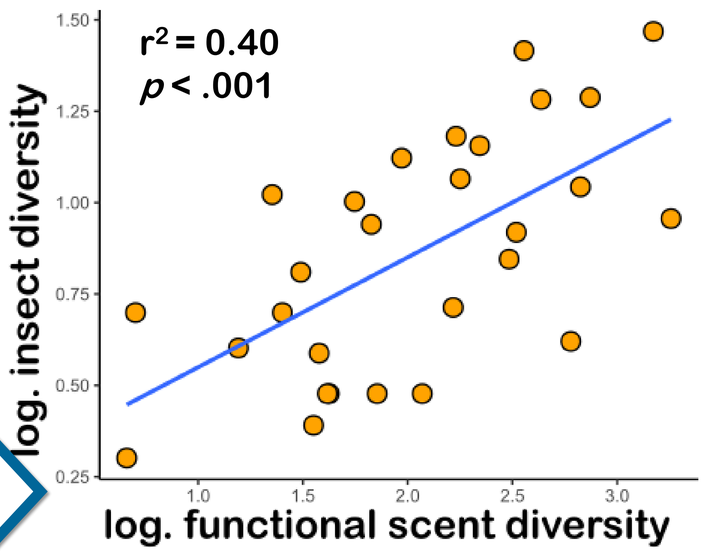
Floral scent bouquets are multifunctional traits of plants that mediate interactions with animals *and* microorganisms. Their chemodiversity can be calculated using the R-Package *ChemoDiv*[d].

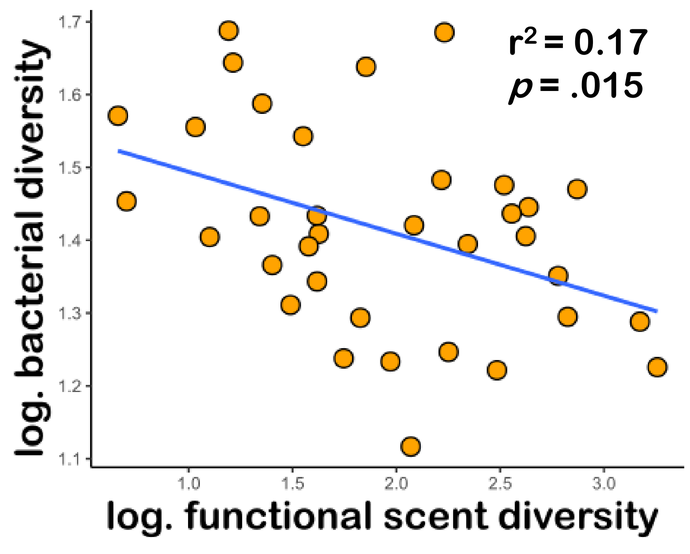


! Volatile organic compounds emitted by flowers promote or inhibit the growth of bacteria and attract or repell flower visitors.

? The dual function of floral scent compounds may shape bacterial and flower-visitor communities.

biotic interactions ~ chemodiversity





Our results from a field study in the Austrian Alps revealed contrasting ecological functions of chemodiversity on flower visitors and microbes. Mechanistic explanations are currently investigated and discussed.

Thus, *chemodiversity* needs to be considered for a comprehensive understanding of the ecology and evolution of floral scents as it constitutes a part of the mechanistic link between plant diversity and ecosystem function.

[a] Petrén et al. (2023) bioRxiv
[b] Larue, Raguso, Junker (2015) Journal of Animal Ecology
[c] Junker and Tholl (2013) Journal of Chemical Ecology
[d] Petrén, Köllner, Junker (2023) New Phytologist

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