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OLIGOLECTY IN BEES: PREDICTABLE PLETHORA OR POISONOUS POLLEN?

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ABSTRACT

Worldwide, about 30% of bees are oligolectic, i.e., their larval pollen provisions consist for more than 90% of pollen of a single plant genus. While oligolecty is ancestral to bees, reversals from polylecty to oligolecty, as well as switches in specialisation to plant genera from different families, are common. The main driver of oligolecty is thought to be the presence of a superabundant resource, or a predictable plethora, coinciding with a short nest provisioning period. This is well supported, as is the notion that oligolectic bees face larger conservation threats than polylectic species.

However, increasing experimental and observational evidence indicates that the predominant pollen sources used by many oligolectic bees may be toxic to the larvae of co-occurring polylectic species, and even to polylectic congeners. Here, we will explore this evidence, some known aspects of toxicities, as well as the benefits for plants to produce toxic pollen. We argue that pollen toxicity, may be one of the main drivers for oligolecty, and may cause runaway selection for oligolecty through increased pollen availability.

The toxicity itself has consequences for visitation of bee species to native plants, introduced weeds and crops, and these play out on a global scale. We will use the insights to argue that the increasingly narrowing focus on the conservation of crop pollinating species may not be helpful and actually hinder true bee conservation. On the flipside, understanding pollen dietary requirements should form the basis for effective conservation and restoration efforts for endangered bees.