Summer thistles and pollinator conservation: wild bee diversity and honey bee cleptolecty

Guillaume Kerdoncuff*[1], Benoît Geslin[2], David Genoud[3], Lise Ropars[4], and Bertrand Schatz[5]

[1]Centre d'Ecologie Fonctionnelle et Evolutive – CNRS-IRD-Université de Montpellier, École Pratique des Hautes Études [EPHE], Montpellier SupAgro, INRAE, Université Paul Valéry - Montpellier III – France

[2]Institut méditerranéen de biodiversité et d'écologie marine et continentale – Aix Marseille Université (Aix-en-Provence), Institut de recherche pour le développement [IRD], CNRS, Université d'Avignon, Pythéas, Aix-Marseille Université – France

[3]Indépendant – POLLINECO – France

[4]Centre d'Ecologie et des Sciences de la COnservation – Museum National d'Histoire Naturelle, Sorbonne Universite, Centre National de la Recherche Scientifique – France

[5]Centre d'Ecologie Fonctionnelle et Evolutive – Senior researcher – France

Résumé

Pollinators, particularly bees, are essential for the ecological function of pollination, which is crucial for maintaining healthy ecosystems. They are impacted by the ongoing sixth mass extinction, highlighting the critical need for their conservation. In particular, climate change reduces floral resources (number of flowers, nectar, pollen) in many contexts and can cause a mismatch between the emergence of pollinators and the blooming periods of the plants they interact with.
In this context, the conservation of late summer flowers is crucial because these species provide the last flowering resources for pollinators. Thistles (*Cirsium spp*, particularly *Cirsium eriophorum*, as well as *Carduus spp* and *Centaurea spp*) are both nectar-rich and summer-flowering species (late July to early September), making them a crucial food source when most of the flora is wilted/dried. As results, they are the support for an intense competition between active pollinators to exploit the remaining resources.

In this study performed in the Cévennes National Park, we examined the diversity of wild bees and other pollinators on those late blooming species and recorded all competitive events between managed pollinators (honey bees) and wild pollinators. We identified 3,925 bees from 59 species observed on 661 flowering individuals of thistles in late August 2023 confirming the role of the crucial central nodes of these thistles for pollinators at the end of the season.

Additionally, we observed an overlooked competition mechanism between wild and honey bees: pollen cleptolecty through direct competition. Honey bee individuals were regularly observed robbing pollen from wild bees and we observed 66 events of cleptolecty on 12 different wild bee species.

*Intervenant

This pollen theft behavior is often considered anecdotal and primarily noted in areas where *Apis mellifera* has been introduced, such as North America. Here, we report new, well-documented instances of cleptolecty in France, exerted by honey bees on a wide diversity of wild bees. Our results suggest that cleptolecty could be a widespread behavior of honey bees late in the season when resources are scarce.
Finally, we also highlight the importance of late resources and the importance of late resources and the importance of changing the perception of thistles. They should no longer be seen as useless plants to be cut down (for reasons of space or cleanliness), but rather as vital elements for the biodiversity of local pollinators, which should be the subject of awareness and even conservation measures.

Mots-Clés: Pollinator conservation, Wild bees, Summer thistles, Floral resources, Cleptolecty