

Plant conservation: from fundamental questions to practical actions

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Background

- We are currently facing the Earth's sixth mass extinction and many species, including plants, are drastically declining worldwide.
- Orchidaceae, due to their complex biology, is a relevant example of a highly endangered group.
- While there has been a lot of research on Orchidaceae and their ecology, populations are constantly declining. Therefore, an integrated conservation research program that links different temporal, spatial and functional axes is needed.

General aim

- Develop **practical integrated conservation approaches** for plant species that **include fundamental knowledge** of their natural history, biology, ecology, demography and genetics.
- Each of these axes form a separate thesis objective, which will be finally integrated into a practical conservation plan.

Model species



- *Cypripedium calceolus* L. (Orchidaceae)
- Globally vulnerable and locally threatened
- Complex and poorly understood ecology
- Numerous conservation plans but few results

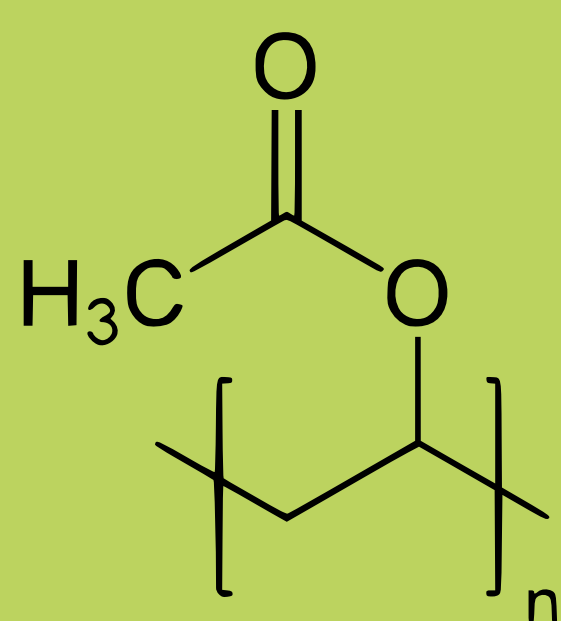
Objective 1

Relationship between pollinator diversity and plant fitness

Methods



Pollinator collection



Scent collection

Objective 2

Genetic structure of populations in relation to their demography

Methods



Leaf collection



Population inventory

Objective 3

Mycorrhizal symbioses across space and time

Methods



Root collection



Soil metabarcoding

Objective 4

Impact of vegetation type and structure on populations' decline

Methods



Vegetation inventory



Vegetation structure inventory

Expected outcomes and future challenges

- Use all the collected data to define a practical conservation strategy for *C. calceolus*.
- Generalize this strategy and these results to other plant species.
- Conserve plant species more efficiently with integrated methodology.

