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# Contribution of wooded habitats to wild bee richness and pollen resources in agricultural landscapes

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## Context

- Wild bees (Hymenoptera), pollinators of entomophilous crops, are threatened by landscape simplification and loss of floral resources.
- Grasslands provide resources to pollinators (nectar, pollen, nest sites).
- There is a lack of knowledge about floral resource supplies provided by wooded semi-natural habitats (SNH) present in agricultural landscapes.

Aim of this study: To evaluate pollen supply of SNH in **wooded habitats (forest edges and hedgerows)** and **herbaceous habitats (grasslands)** for wild bees.

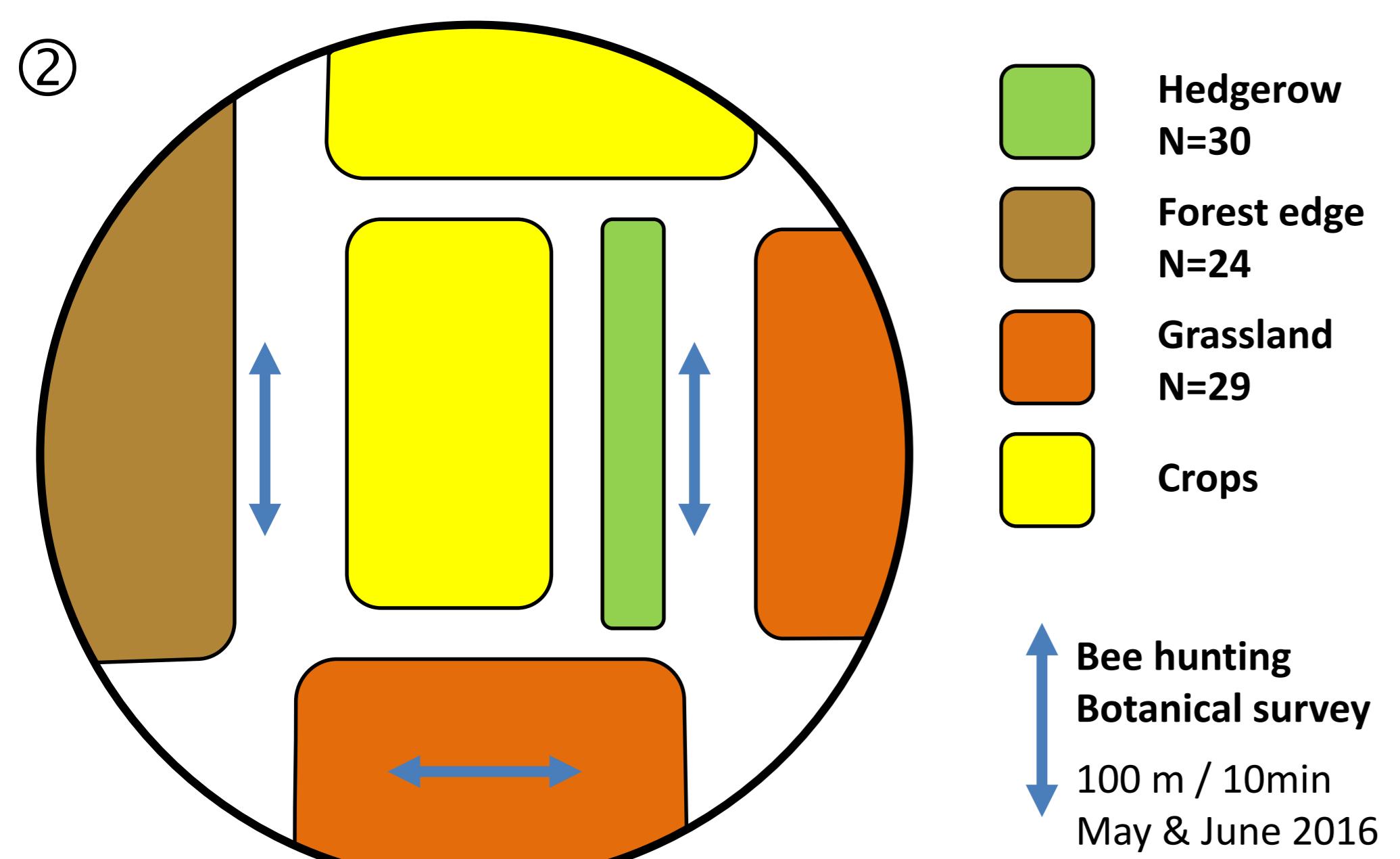
## Study site



Small forests, permanent grasslands and cropfields.

## Experimental design and analyses

- ① 30 landscapes (selected on a gradient of % woods and % grasslands).



- ④ Jacobs's selection index of each species i:

$$D_i = \frac{CR_i - PA_i}{CR_i + PA_i - 2(CR_i \times PA_i)}$$

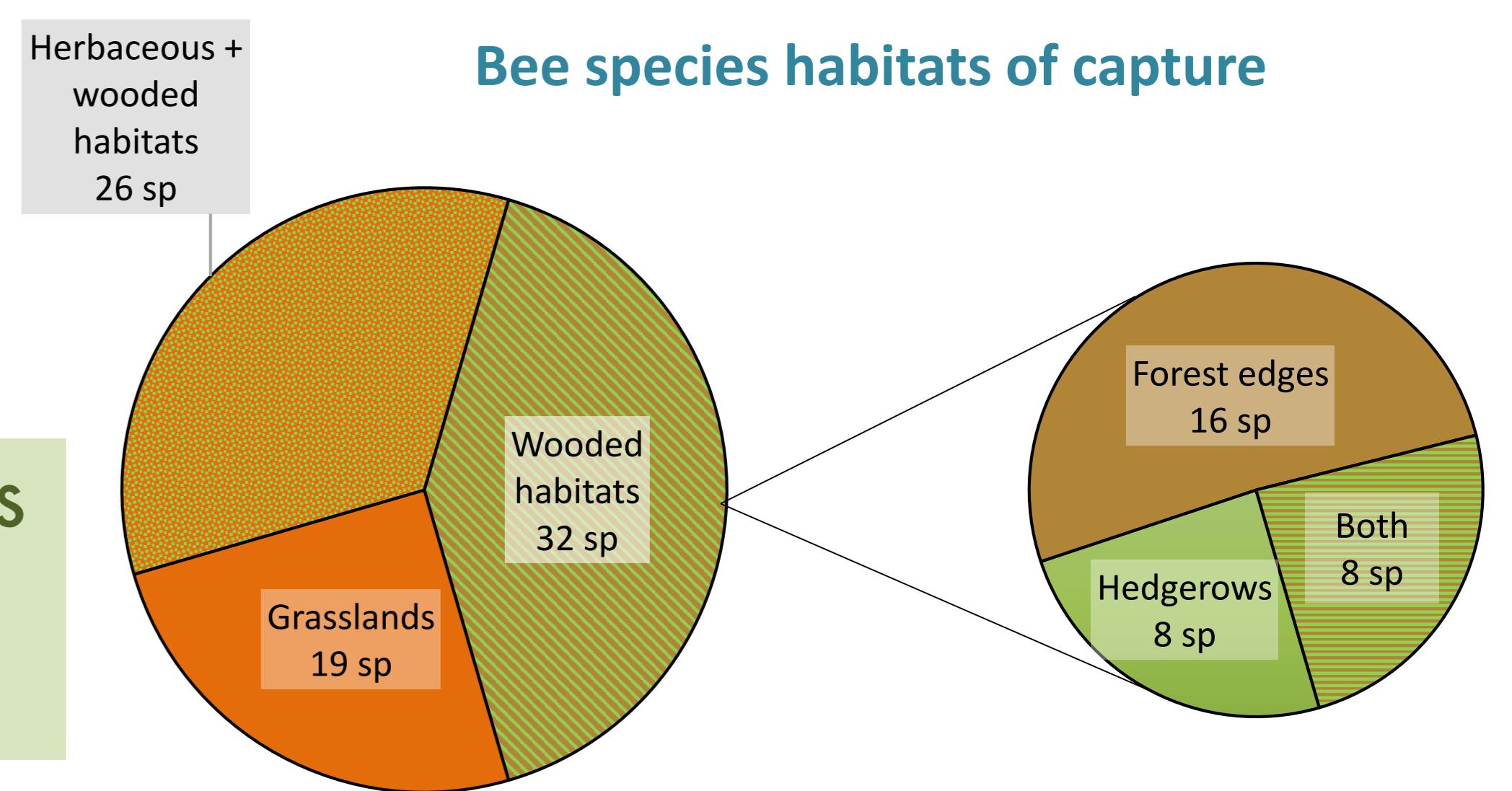
Jacobs's selection index allows comparing for a particular species its consumption frequency to its availability in the study site.

**CR** = Consumption Rate of each pollen species in the survey  
**PA** = Pollen Availability of each pollen species in the pool of landscapes

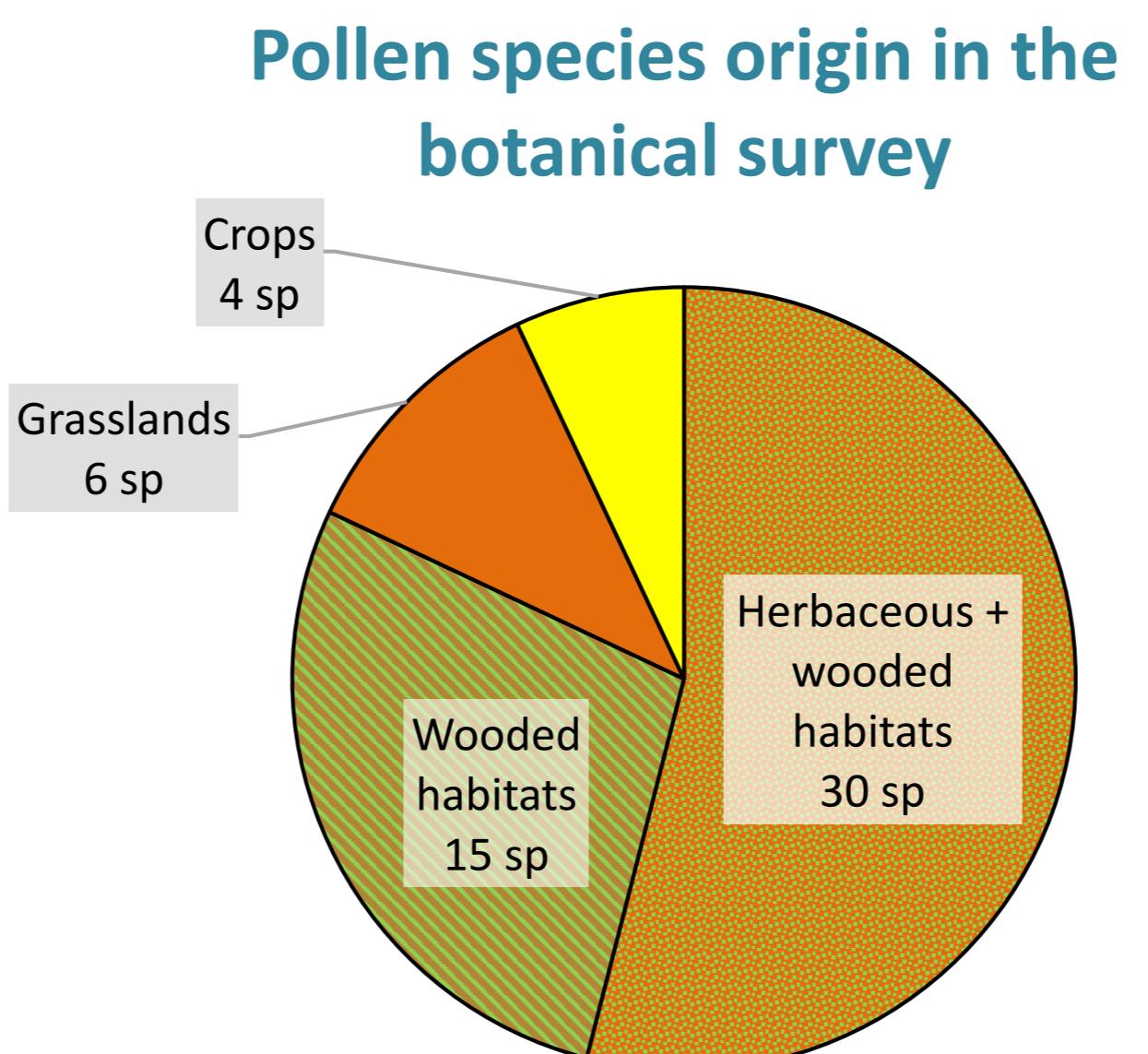
## Results

529 wild bees of 77 species

42% of the wild bee species caught are found only in wooded habitats

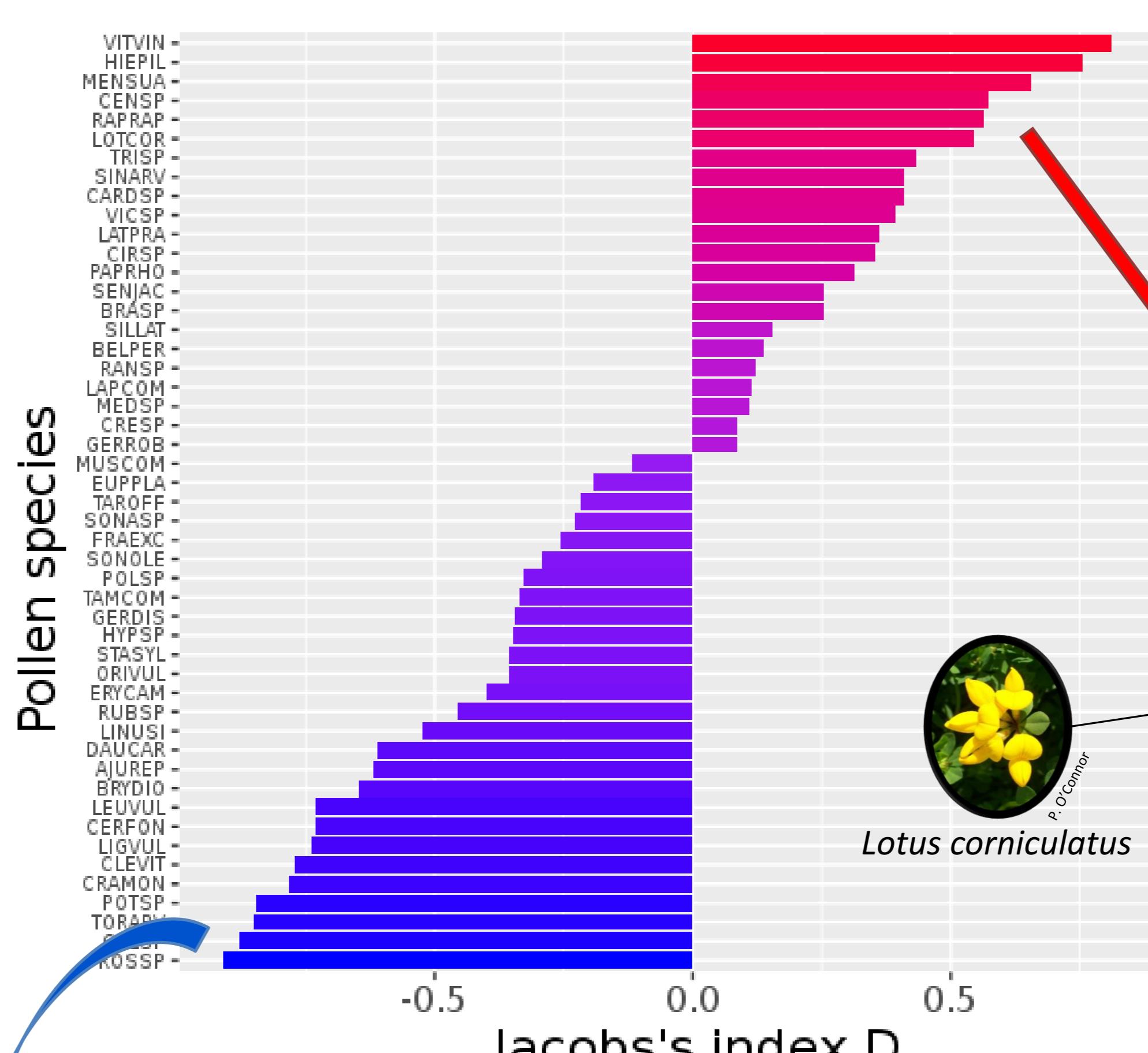


462 pollen samples of 55 plant species – on 28 bee species

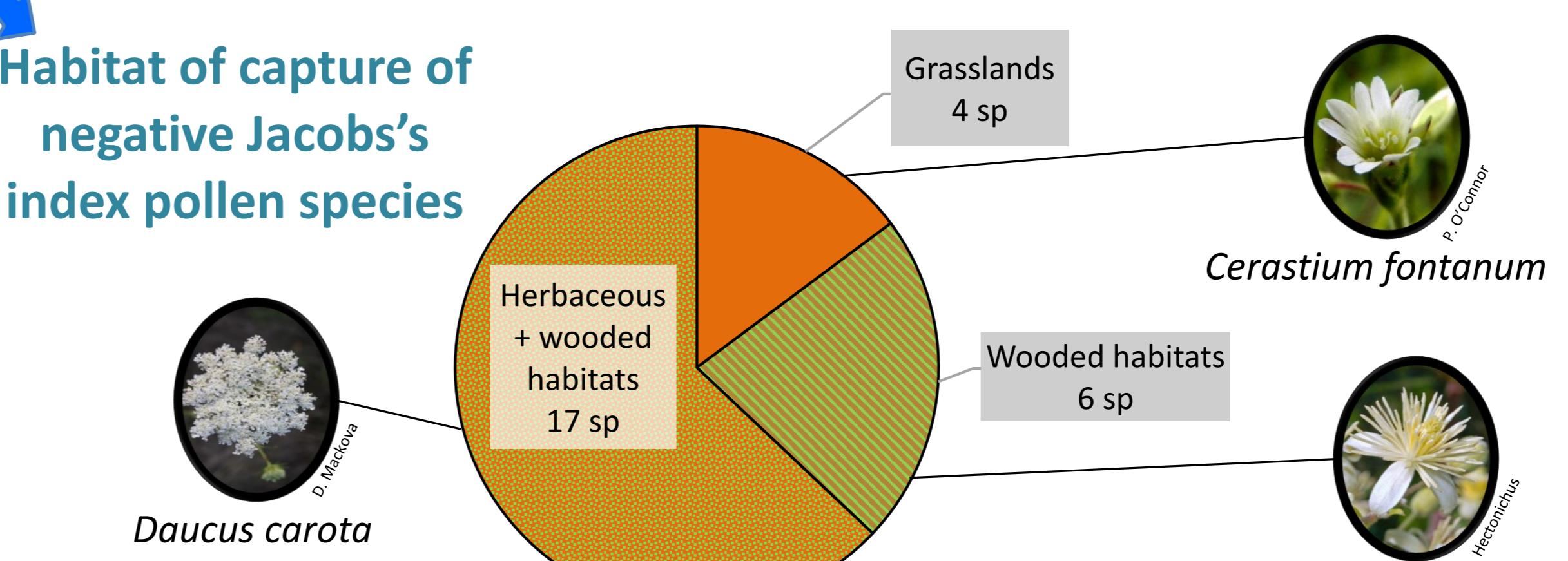


Wooded habitats offer pollen resources to wild bees

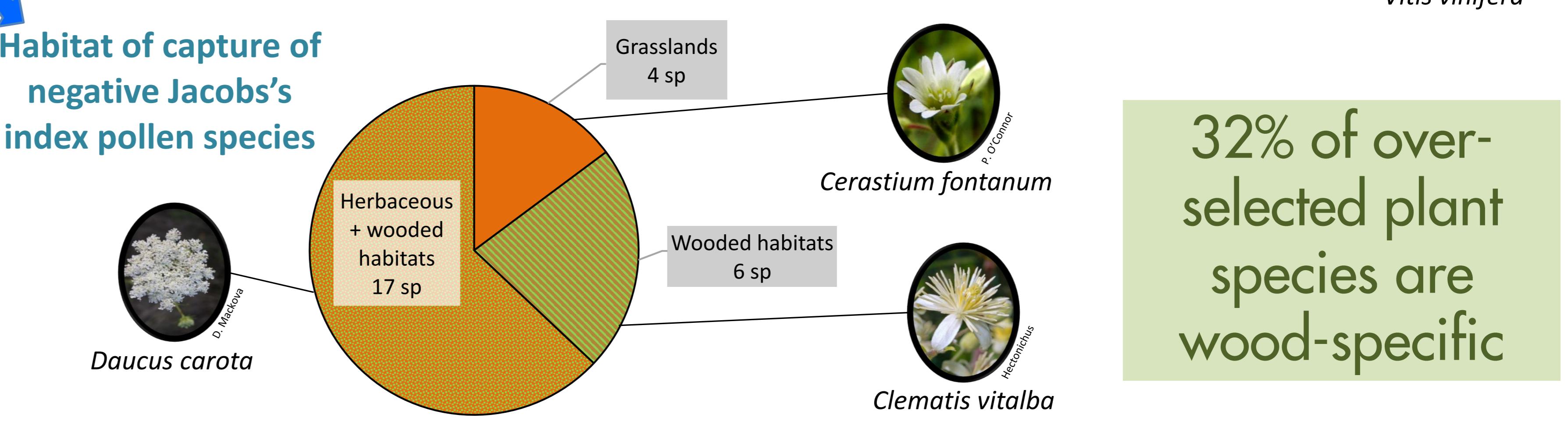
28% of pollen species found on bees are found **only in wooded habitats** (woodland edges and hedgerows ) in the botanical surveys.



Jacobs's selection index of the pollen species found on wild bees in the study site



32% of over-selected plant species are wood-specific



## Discussion & perspectives

Botanical surveys have been done in May for grasslands and in June for wooded habitats. Flowering of species changes across season may influence Jacobs's selection index.

Some pollen species found on bees didn't appear in the botanical surveys. These species are mainly crop-specific (6 species).

### Perspectives :

- To evaluate pollen supply at landscape scale (LP index).
- To use botanical species abundance (instead of presence/absence).