

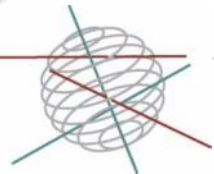
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4. Plant-pollinator interactions Methodological approaches from the field to an experimental design

**Layla SAAD, Anne-Laure JACQUEMART,
Grégory MAHY, Julie LEBRUN & Valérie CAWOY**

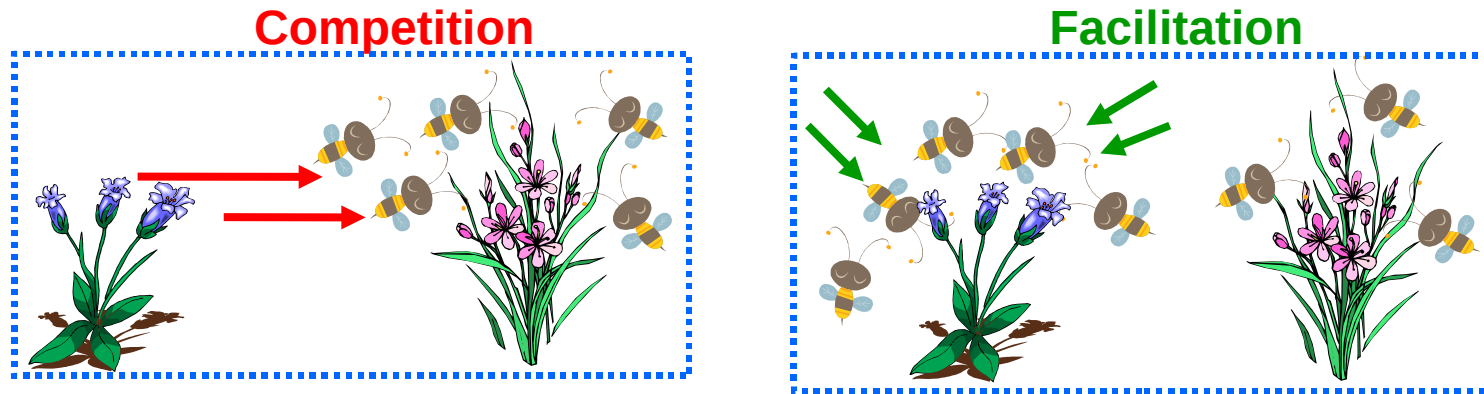


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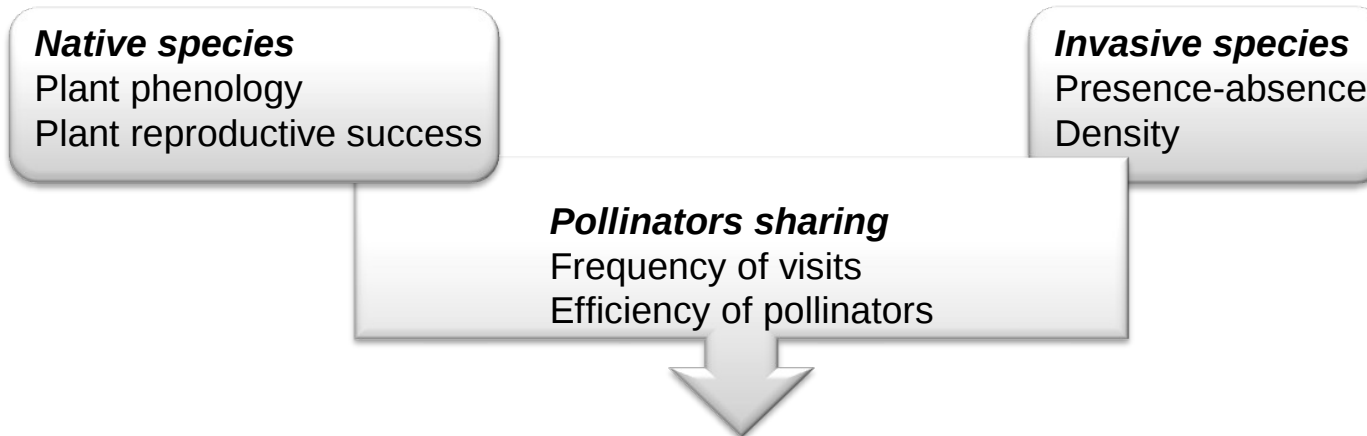


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Plant-pollinator interactions



Key elements to consider for studying plant-pollinator interactions:



Effect on native species seed set

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Two methodological approaches

I. Pollination web in the field



Fallopia spp.



Solidago gigantea

II. Outdoor controlled competition experiments with potted plants



Impatiens glandulifera



Senecio inaequidens

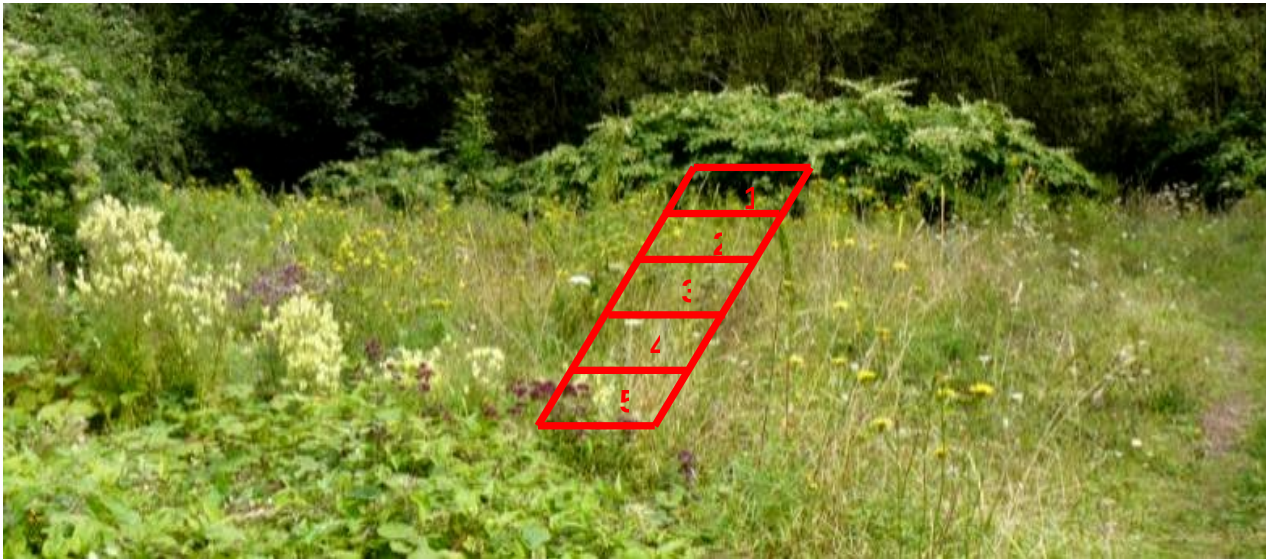
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I. Pollination web

Study sites

3 sites per target HIPS

Permanent transect (2X10 m) including the target HIPS and adjacent native species community



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I. Pollination web

Visitors observations

Each plant-insect interaction recorded :

- precise identification for the plant species
- category identification for the insect species



Green fly

x

Solidago gigantea



Large hoverfly

x

Origanum vulgare

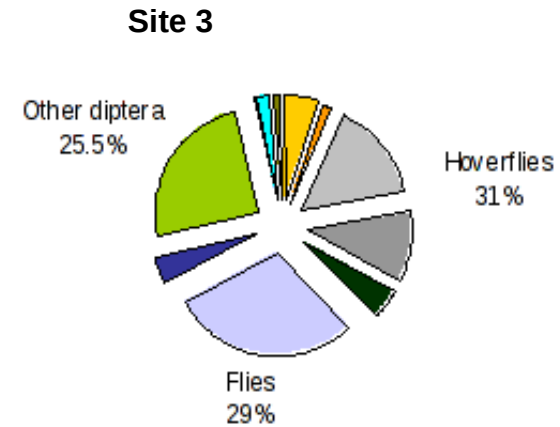
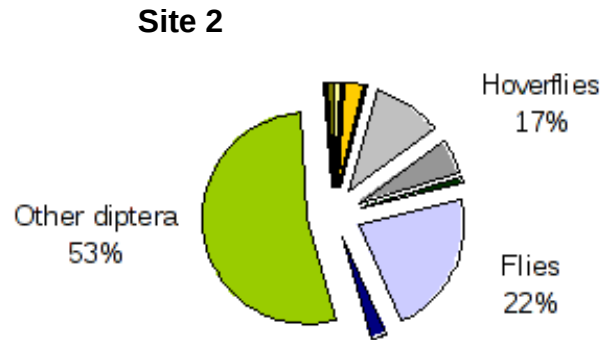
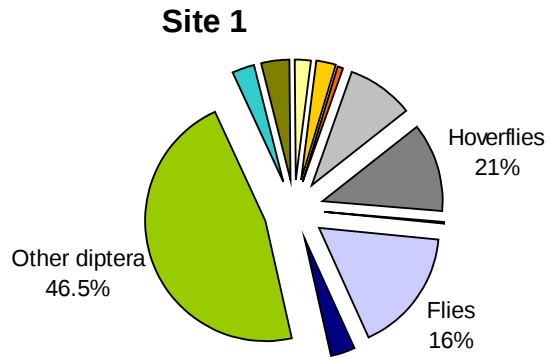


Solidago gigantea



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Pollination web – Results



Solidago gigantea visitor guild

- APIMEL
- BOMTER
- OTHH YM
- VESPOI
- HOVLAR
- HOVSMA
- HELOPH
- FLIES
- DIPMC
- OTHDIP
- HEMPT
- CANTHA
- OTHERS



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Pollination web – Results

Pollination web

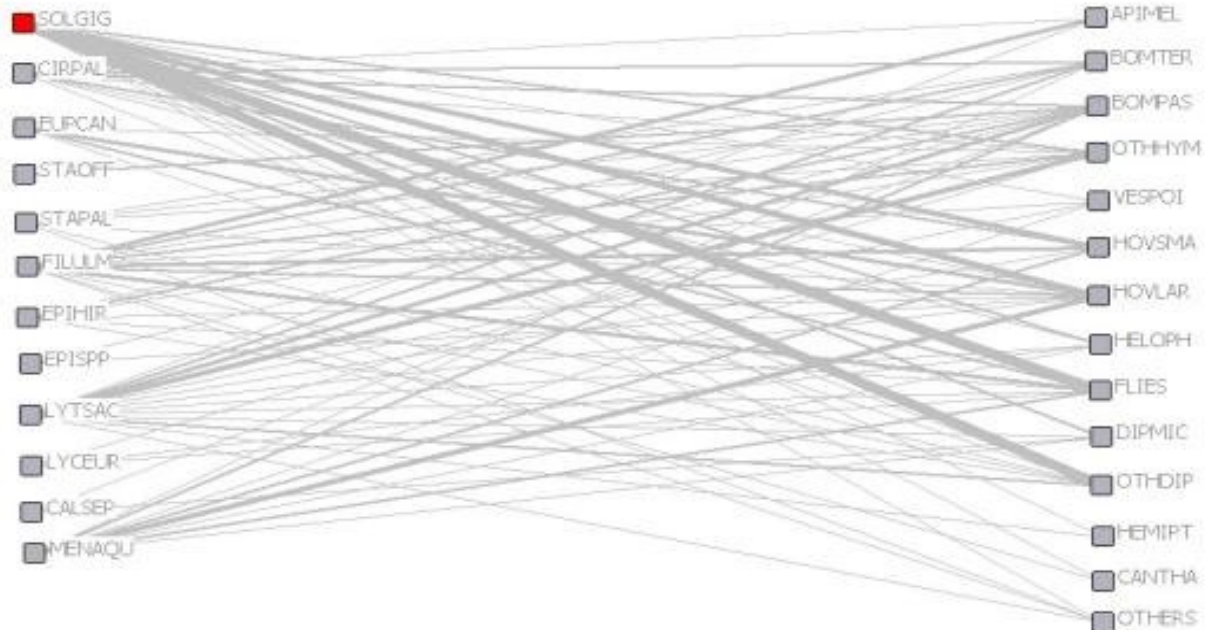
Between 300 and 3000 plant-pollinator interactions recorded in the communities

12 plant species

14 insect categories

Proportional
similarity

EUPCAN	56.06
FILULM	53.59
MENAQL	47.72
EPIHIR	40.6
LYCEUR	39.32
CIRPAL	32.38
LYTSAC	32.29
STAPAL	29.41
EPISPP	15.36
CALSEP	0
STAOFF	0



627 interactions

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Pollination web – Results

Pollination web

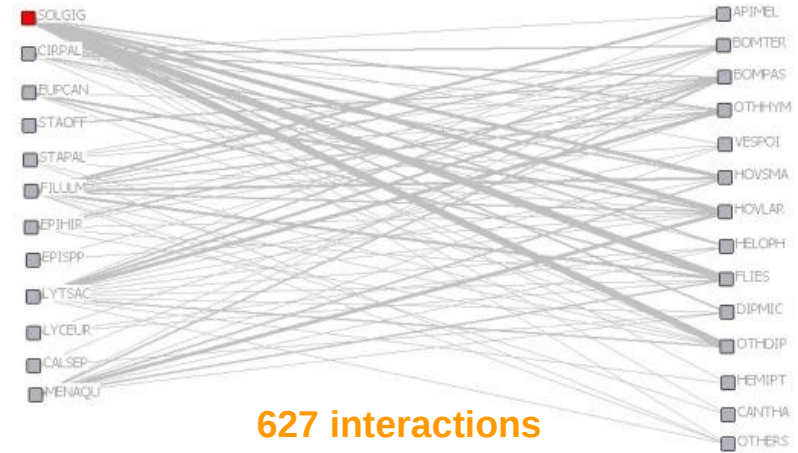
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12 plant species

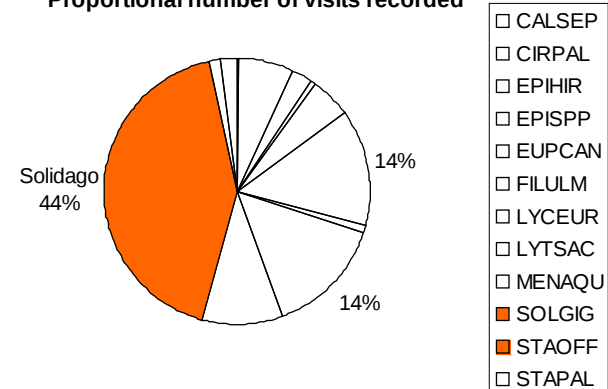
14 insect categories



Frequency of visits

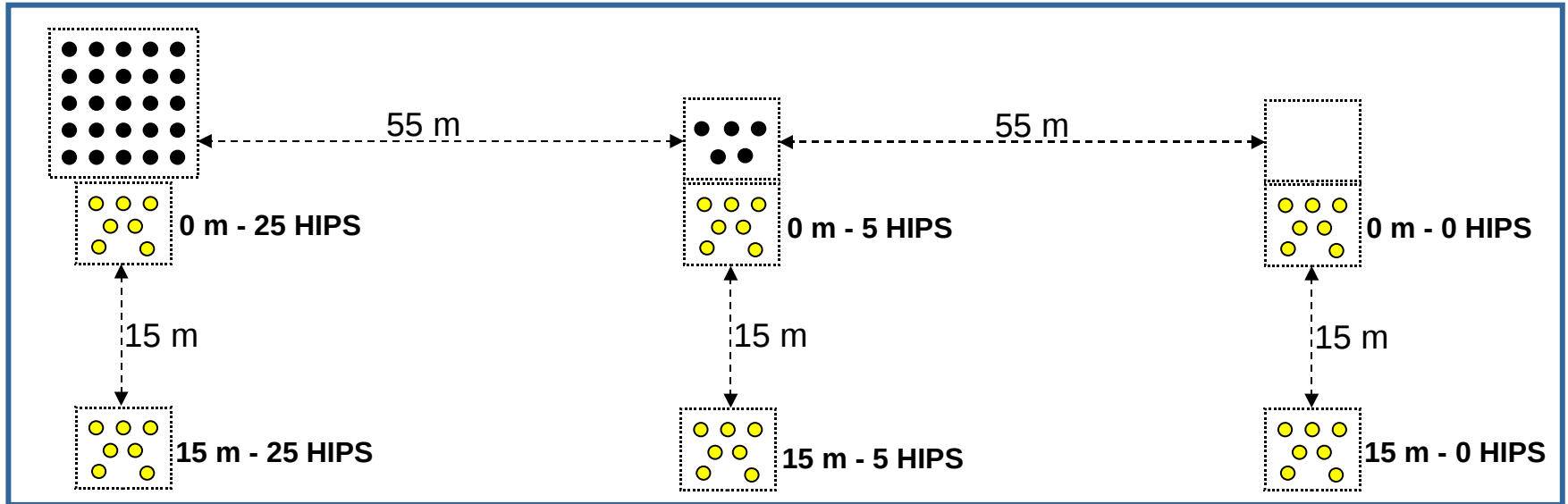
Between 35% and 57% of all visits recorded in the communities were on *Solidago gigantea*

Rixensart
Proportional number of visits recorded



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II. Controlled experiments - Experimental design



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Controlled experiments - Invasive-native pairs

1



Impatiens glandulifera



Epilobium angustifolium

2



Impatiens glandulifera



Aconitum napellus
subsp. *lusitanicum*

3



Senecio inaequidens



Jacobaea vulgaris
(*Senecio jacobaea*)



Impatiens glandulifera &
Epilobium angustifolium



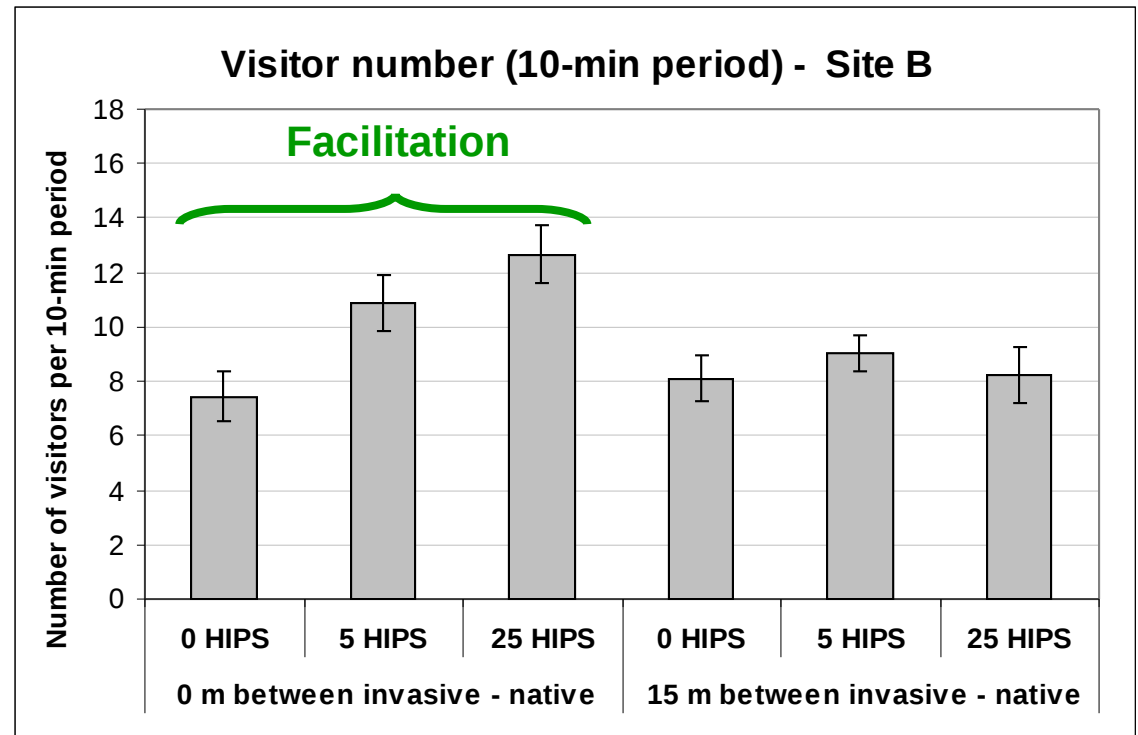
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Controlled experiments – Results



Observation periods of 10 min

Number of visitors



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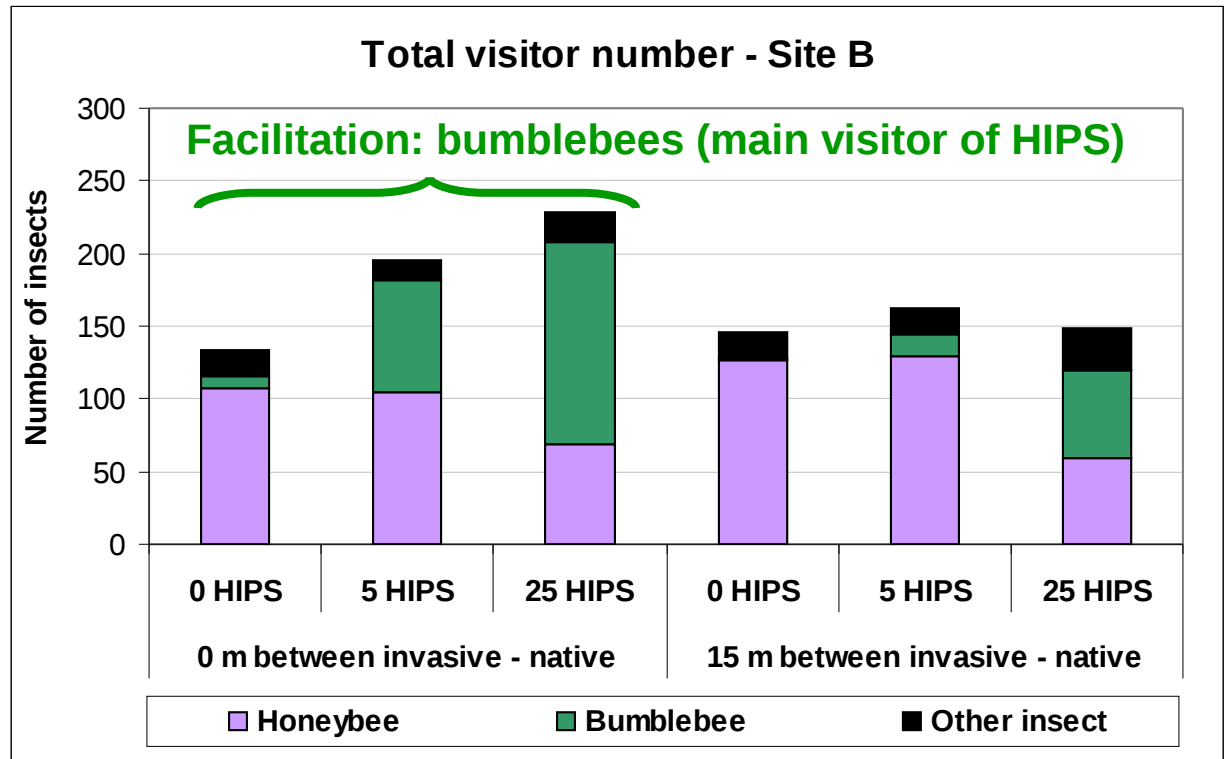
Controlled experiments – Results



Observation periods of 10 min

Number of visitors

Visitors categories



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Controlled experiments – Results



Observation periods of 10 min

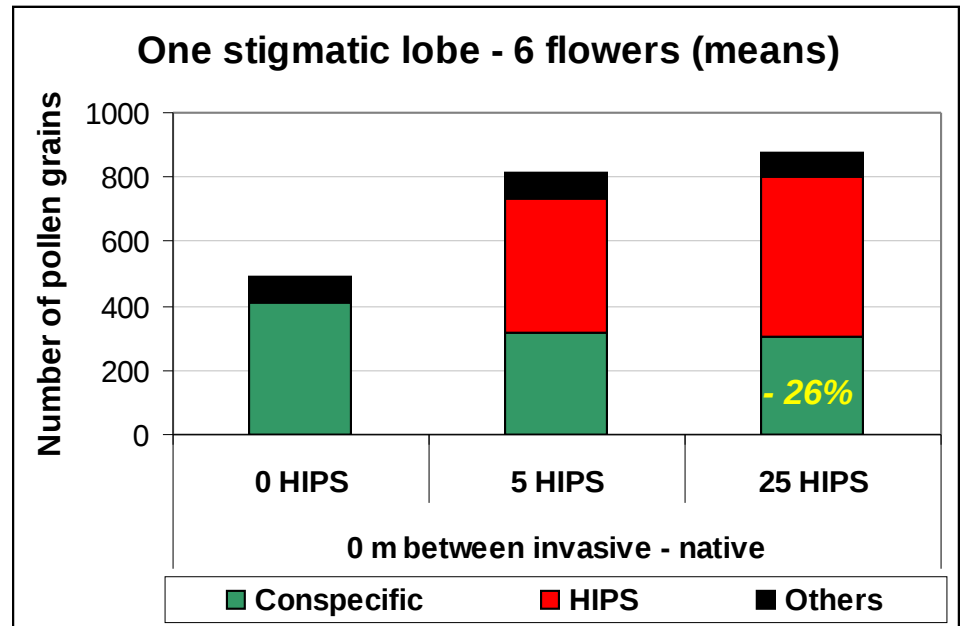
Sampling flowers

Number of visitors

Visitors categories

HIPS pollen deposited ?

Quantity of conspecific pollen



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Controlled experiments – Results



Observation periods of 10 min

Number of visitors
Visitors categories



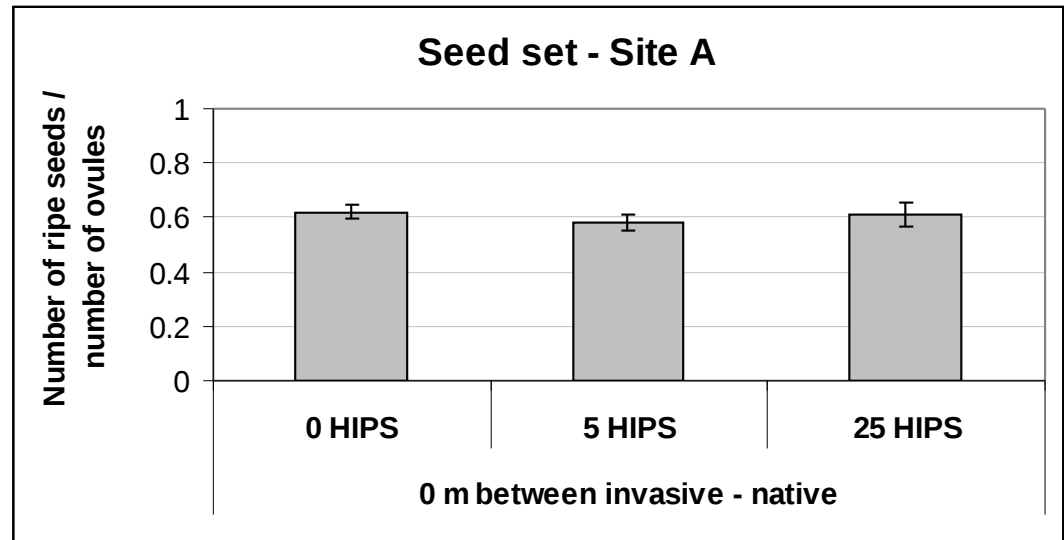
Sampling flowers

HIPS pollen deposited ?
Quantity of conspecific pollen



Sampling fruits

Seed set



no pollen limitation (560 ovules per ovary and at least 1260 conspecific pollen grains deposited)



Plant-pollinator interactions Conclusions

Pollinator web

- Integration of invasive species into the community pollinator web
- More visits to HIPS than to native species

Controlled experiments

- Impacts on the pollinator services mainly detected when native and invasive species were nearby
- Impacts on the pollinator services proportional to the number of invasive individuals
- No impact on the reproductive success of the native species

Thank you for your attention...

Acknowledgements



Colleagues and students (data collection)