Farming with Alternative Pollinators (FAP) : a tool to enhance agriculture resilience in the face of climate change

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University of Mons, laboratory of zoology, Mons, Belgium
ICARDA, Rabat, Morocco

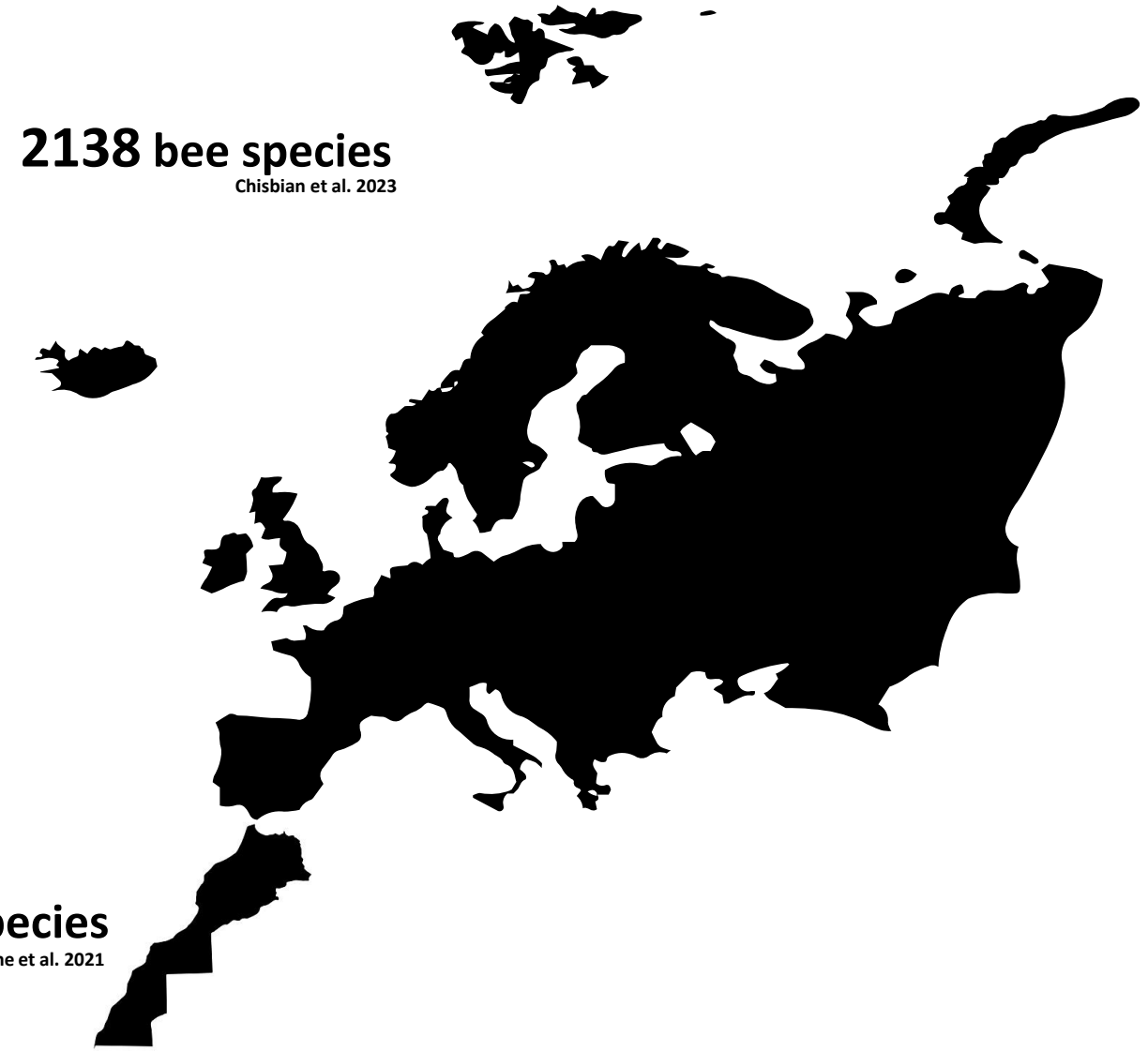
1200 genera

20 900 bee species

932 bee species

Lhomme et al. 2021

2138 bee species
Chisbian et al. 2023



932 bee species
Lhomme et al. 2021

136 species of butterflies

Verovnik et al. 2018

150 hoverfly species

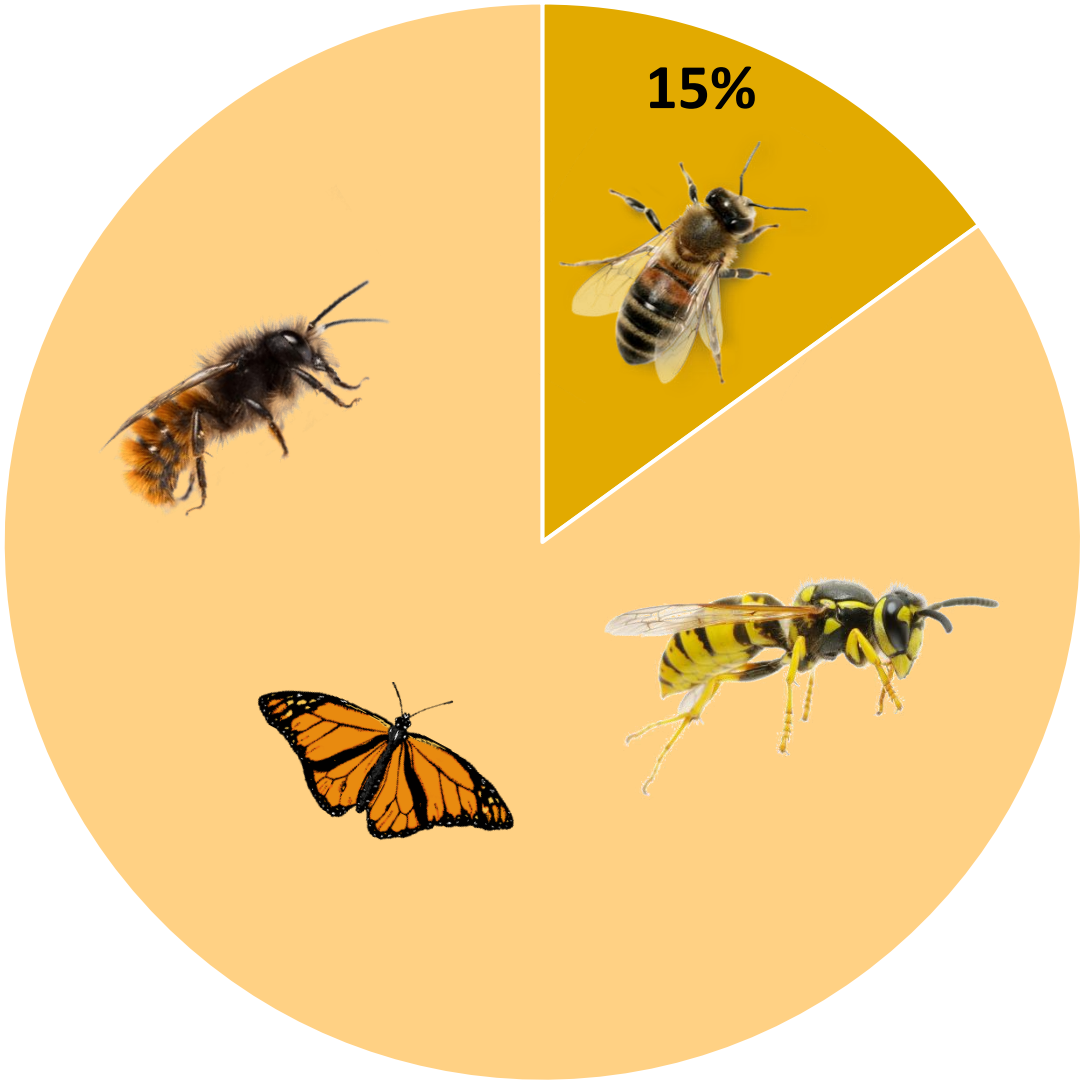
Kettani et al. 2022
Sahib et al. 2020

X100

Economic value of honey production

Economic value of crop pollination

FAO


15%

1. Why can't we rely solely on honey bee for pollination service?

2. How pollinator biodiversity boosts agro-ecosystem resilience in the face of climate change?

3. How can we promote pollinator biodiversiy in Moroccon agro-ecosystms?

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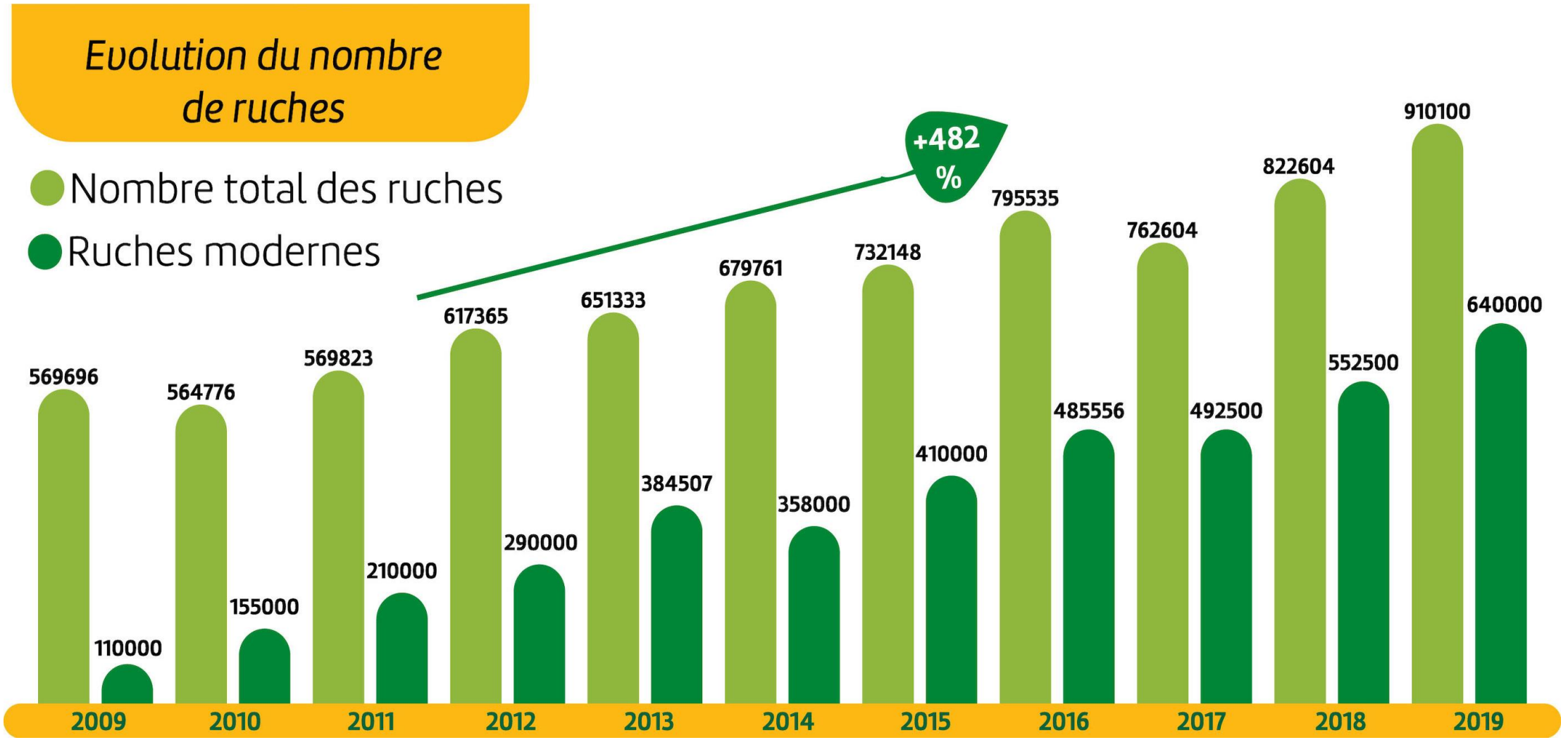
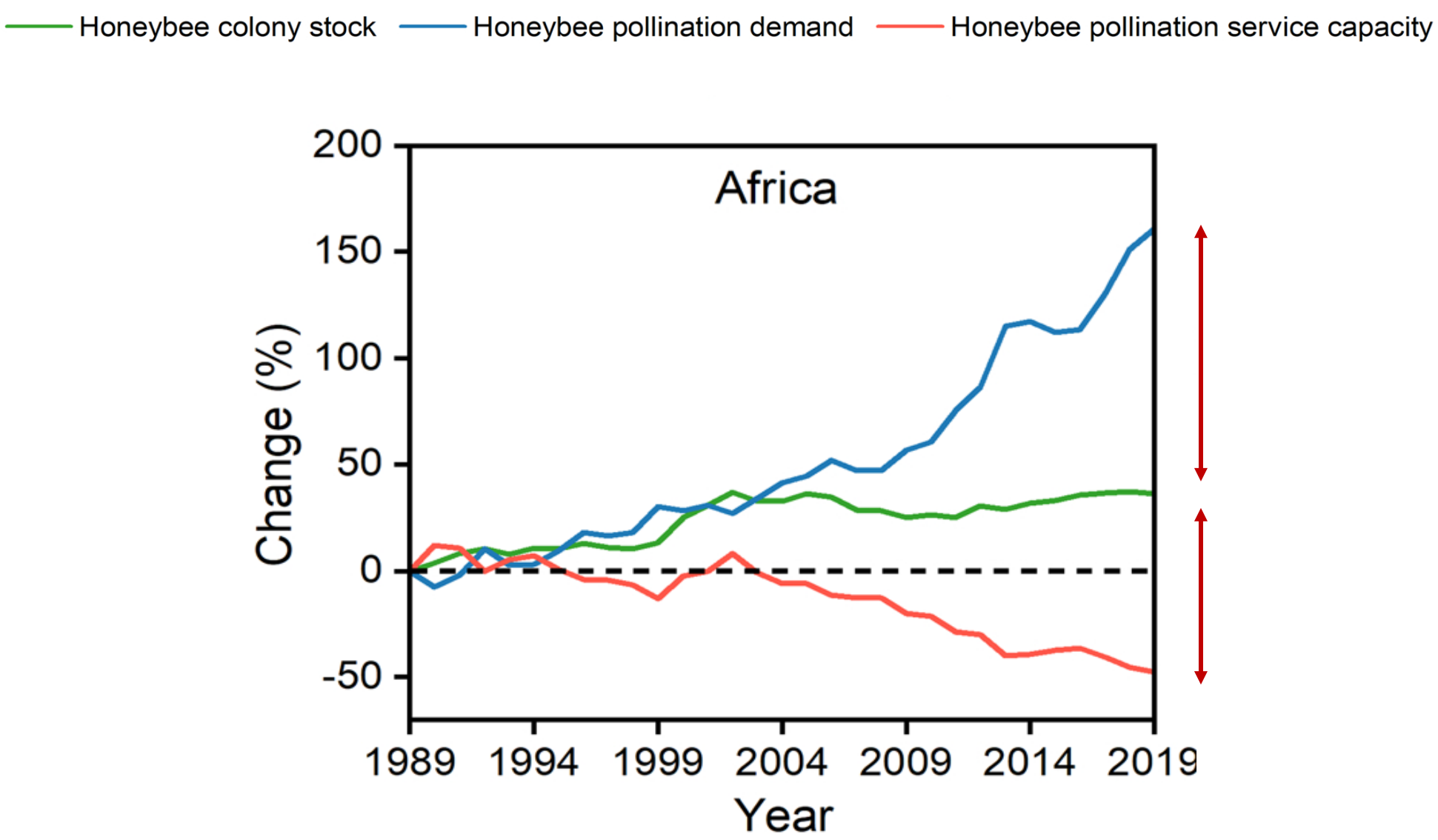
Evolution du nombre de ruches





Mashilingi et al. 2022

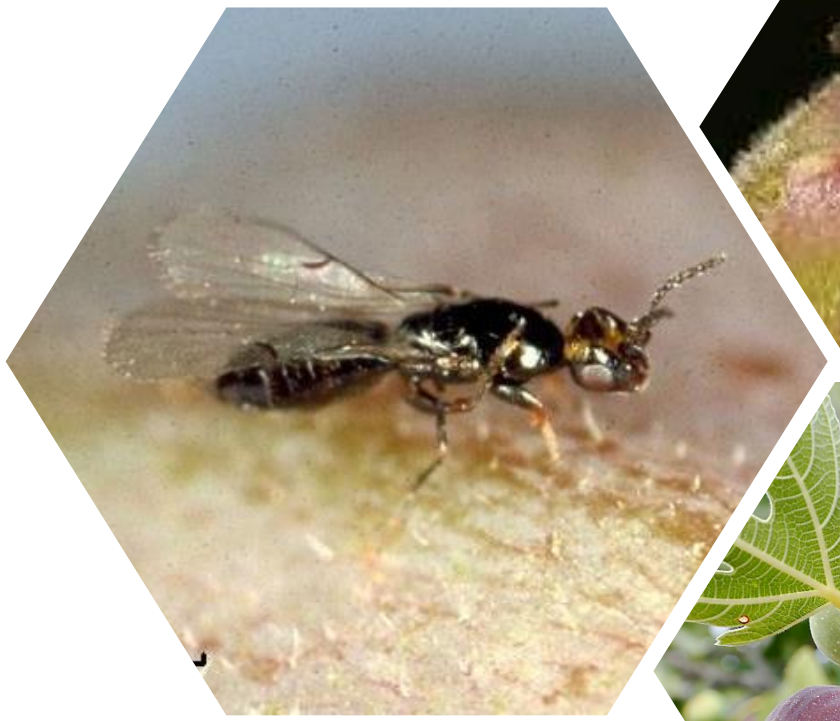
56 $ en (2000)

140-200 $ USD (2015)

- Morphology
- Abiotic conditions

Morphology

Abiotic conditions



Blastophaga psenes (Agaonidae)

Morphology

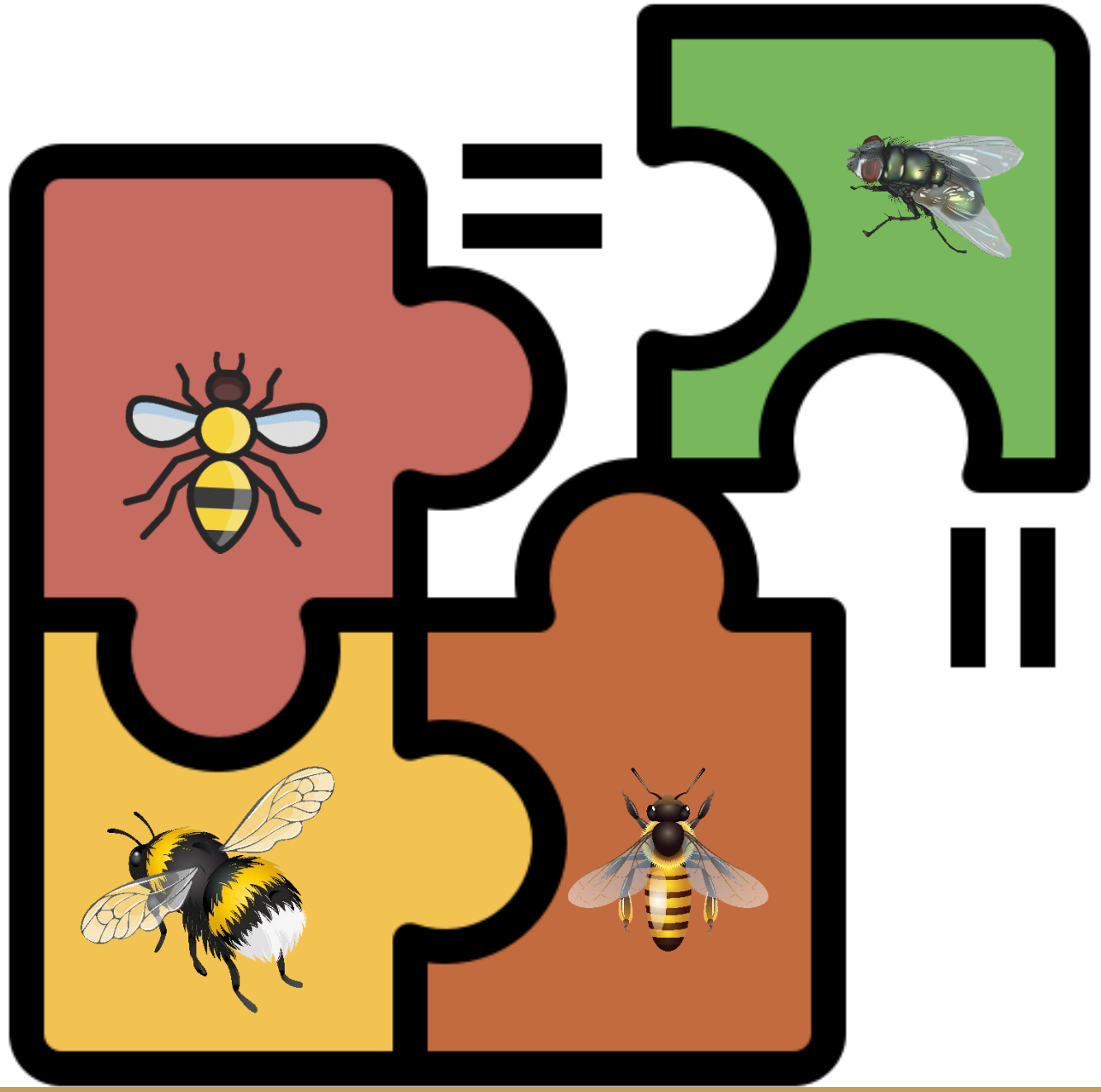
Abiotic conditions

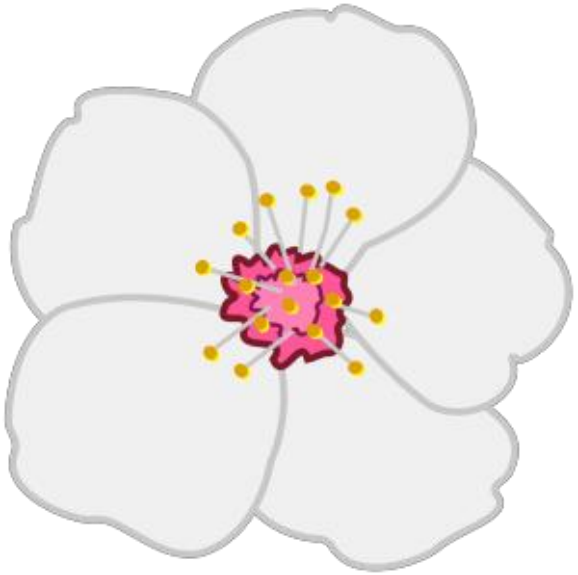
Forcipomyia sp. (Ceratopogonidae)

Morphology

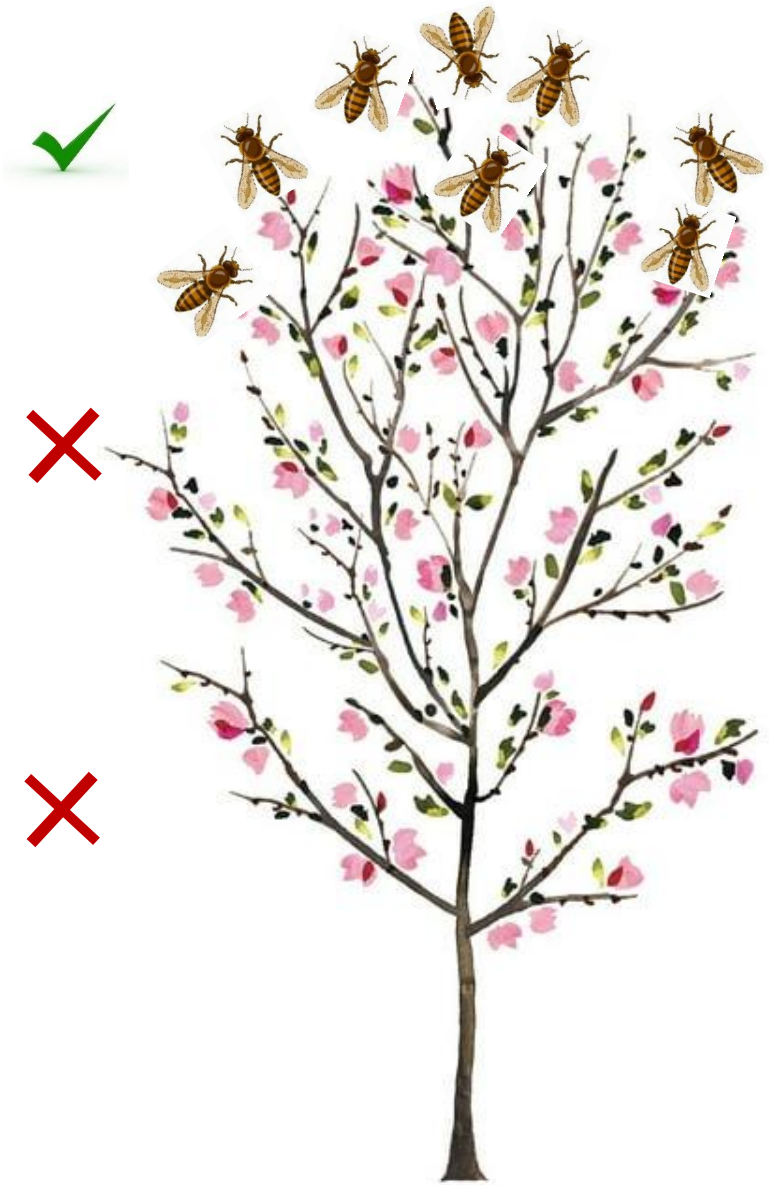
Abiotic conditions

Bombus terrestris and Bombus lapidaries (Apidae)





Brittain et al., 2013



Brittain et al., 2013

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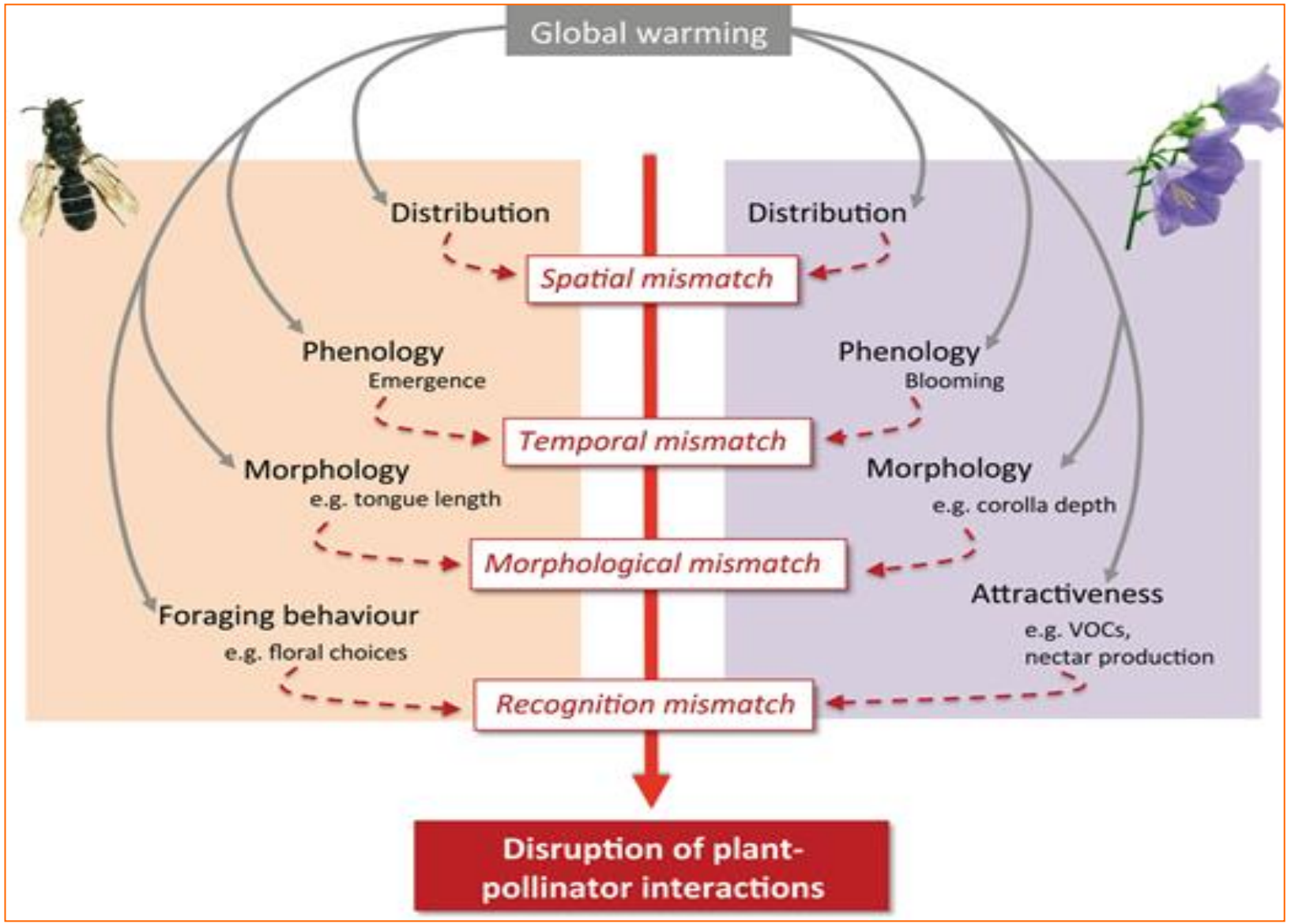
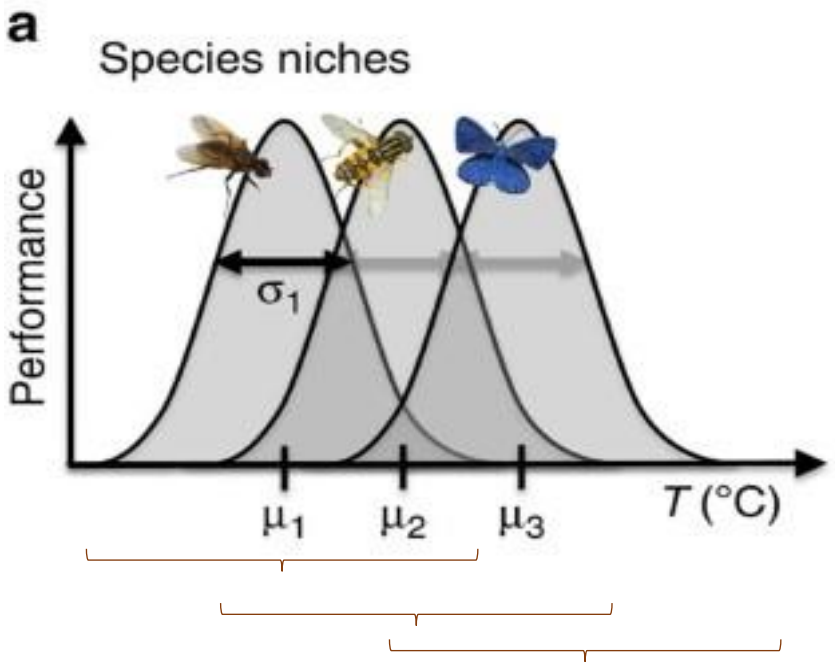
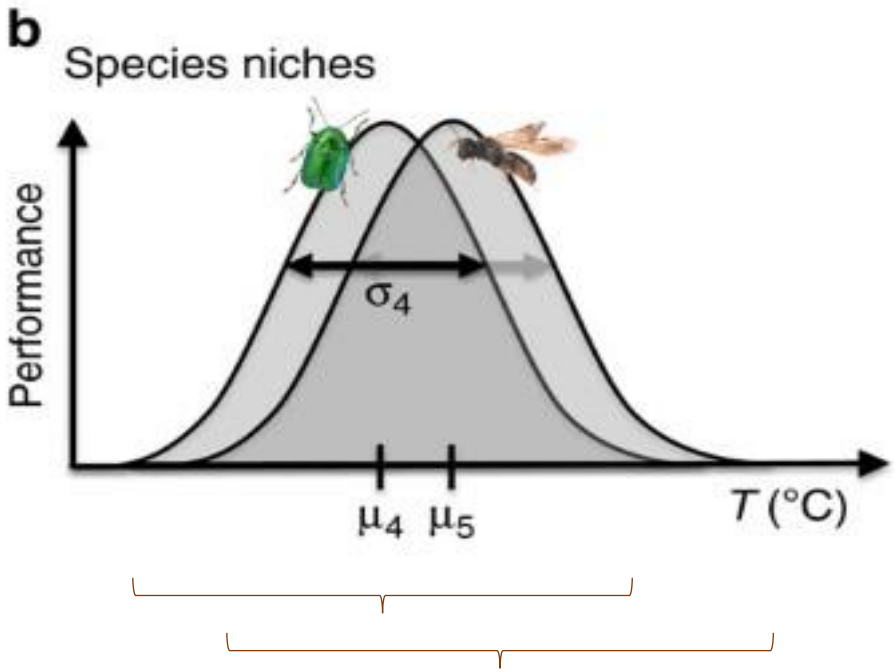
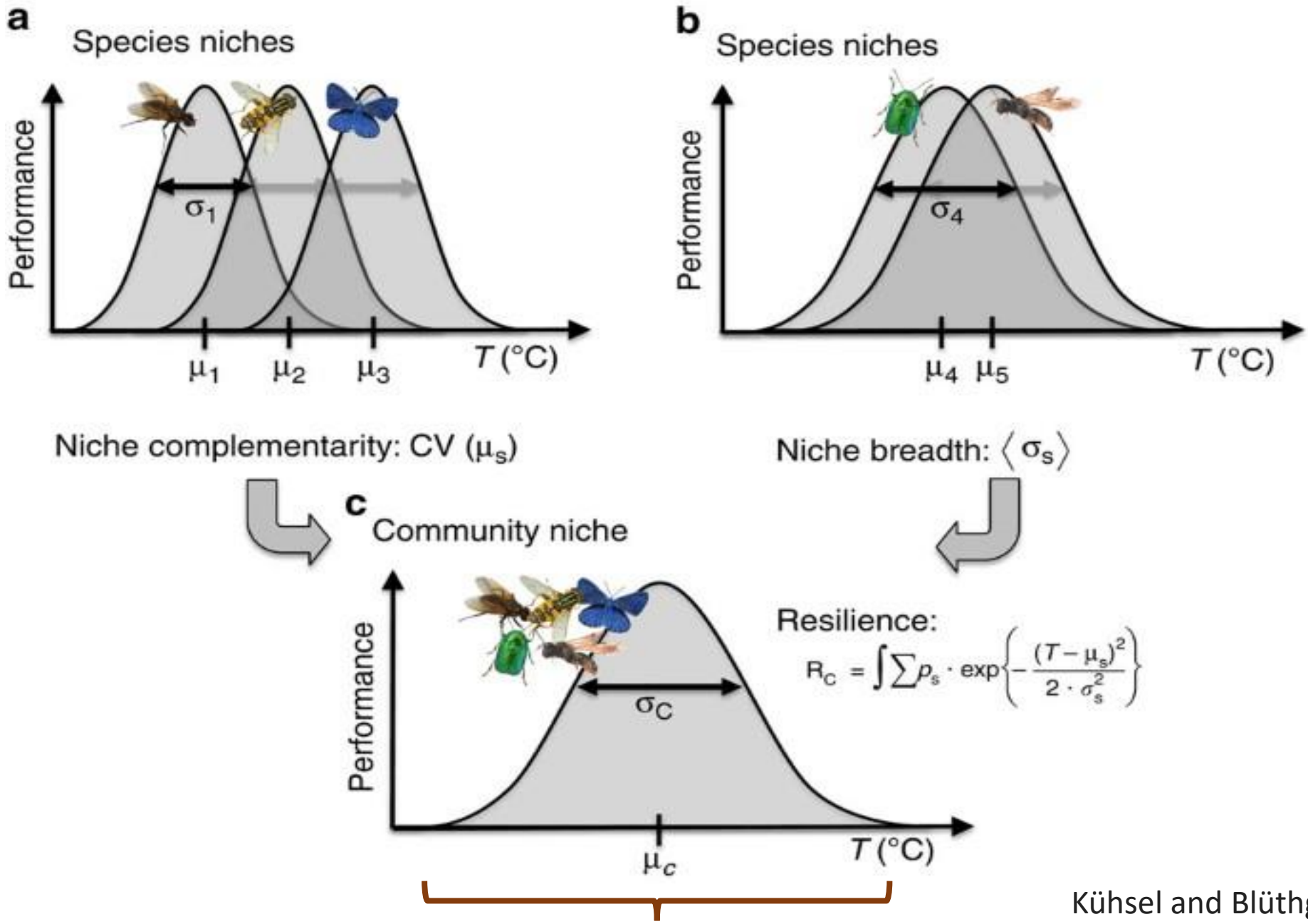


Gérard et al. 2020

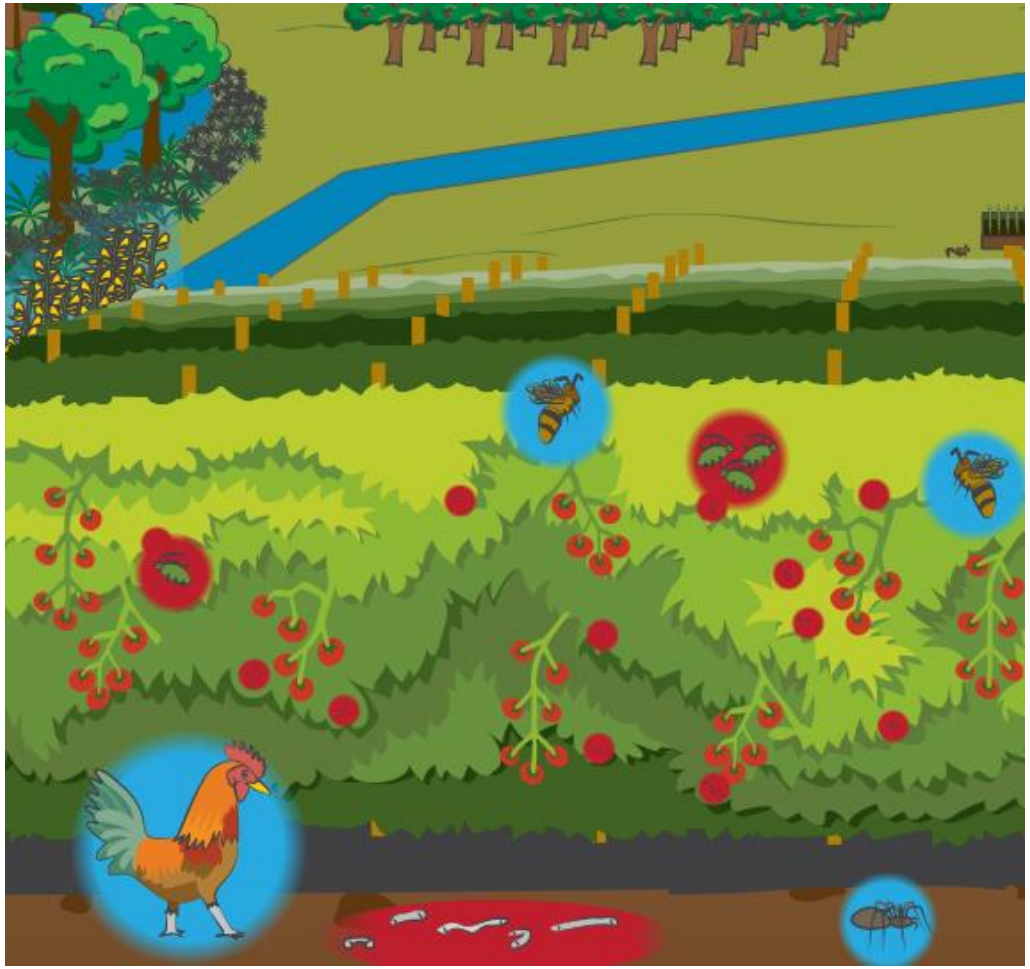




Kühsel and Blüthgen 2015



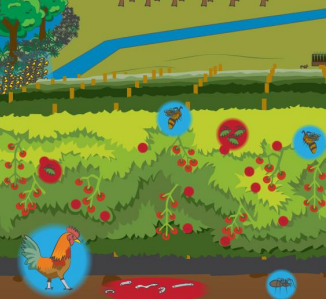
Kühsel and Blüthgen, 2015



	January		February			
	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4
Faba bean						
Flies						
Hoverflies						
Butterflies						
Bettles						
Wild bees						

	January		February			
	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4
Faba bean						
Flies						
Hoverflies						
Butterflies						
Bettles						
Wild bees						

Kühsel and Blüthgen, 2015



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Kühsel and Blüthgen 2015

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Funds and subsidies

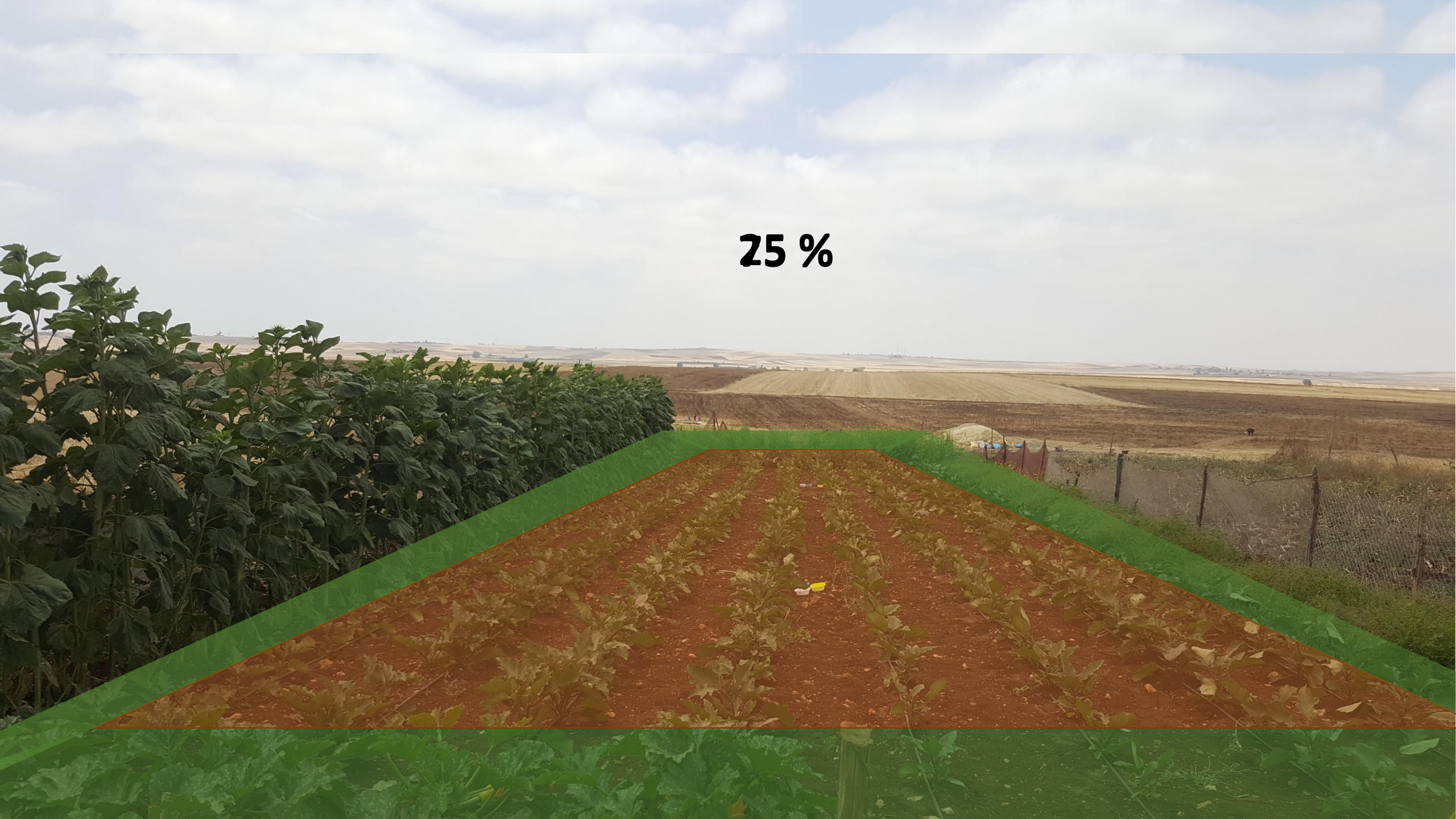
Mass flowering crops

Wild flowering plants

Not economically self-sustaining

Not scalable to low and middle-income countries

Farming with Alternative Pollinator (FAP) Christmann and AW Hassan 2012


25 %

- Assess the impact of the FAP appraoch on pollinators in agro-ecosystems

- Evaluate the impact of the FAP approach on crop pollinators

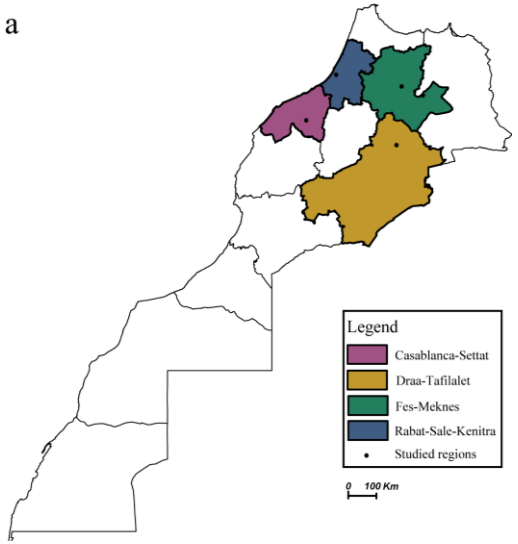





2018

2019

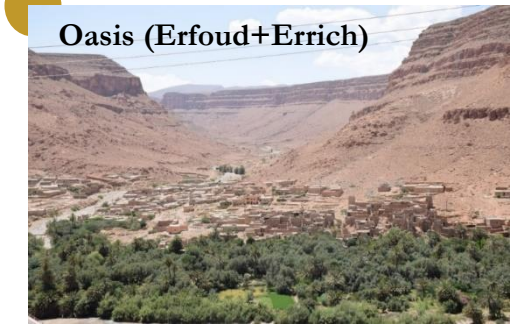
a


Legend
Casablanca-Settat
Draa-Tafilalet
Fes-Meknes
Rabat-Sale-Kenitra
Studied regions
0 100 Km

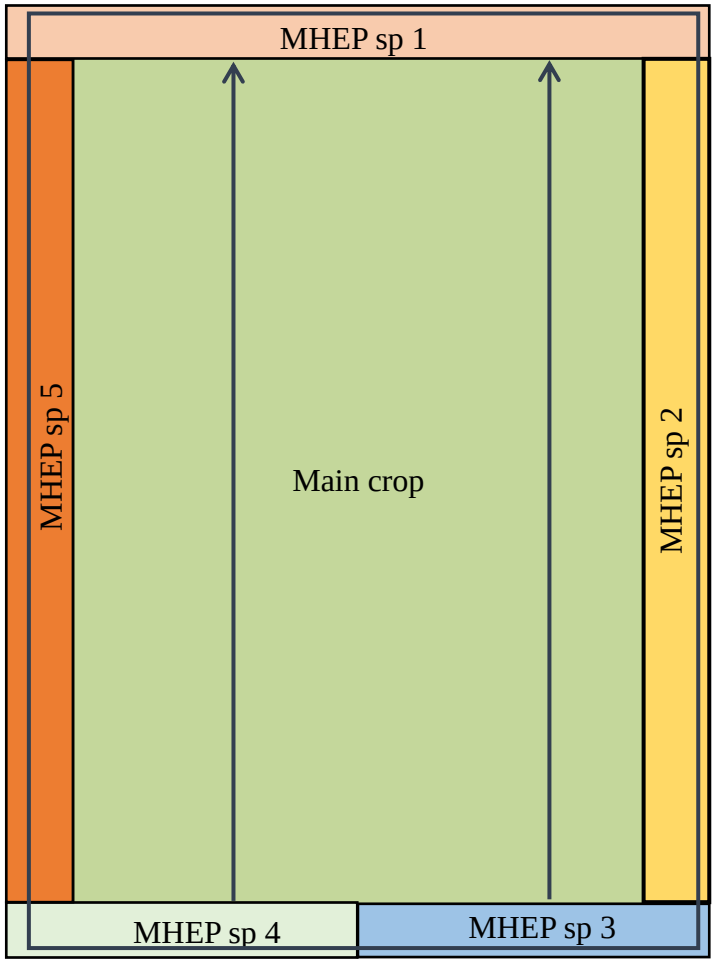

Kenitra


Sefrou

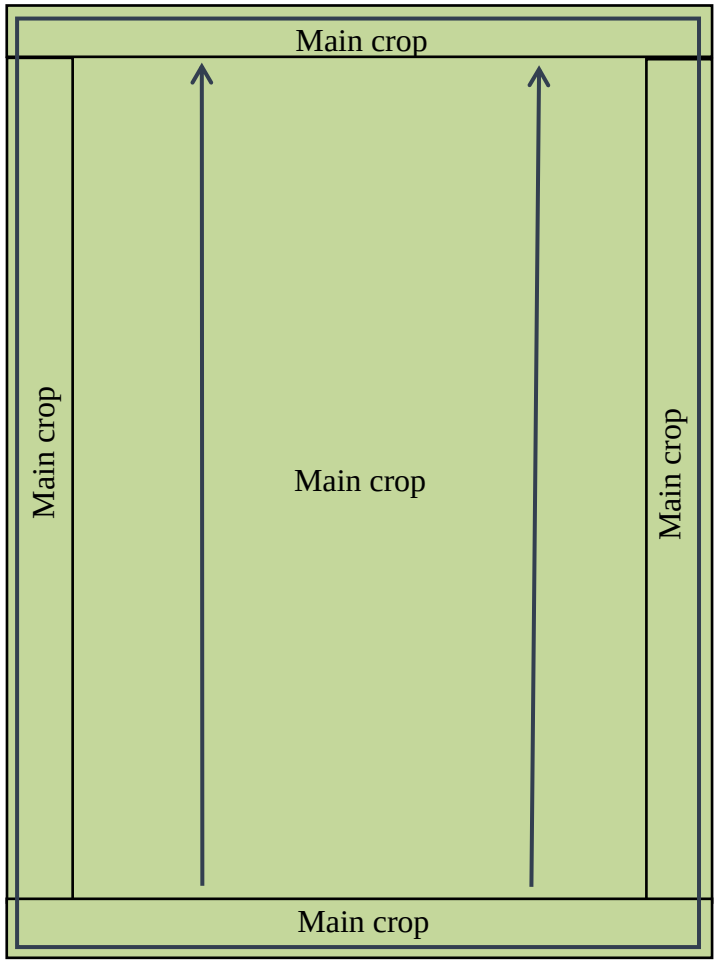

Settat

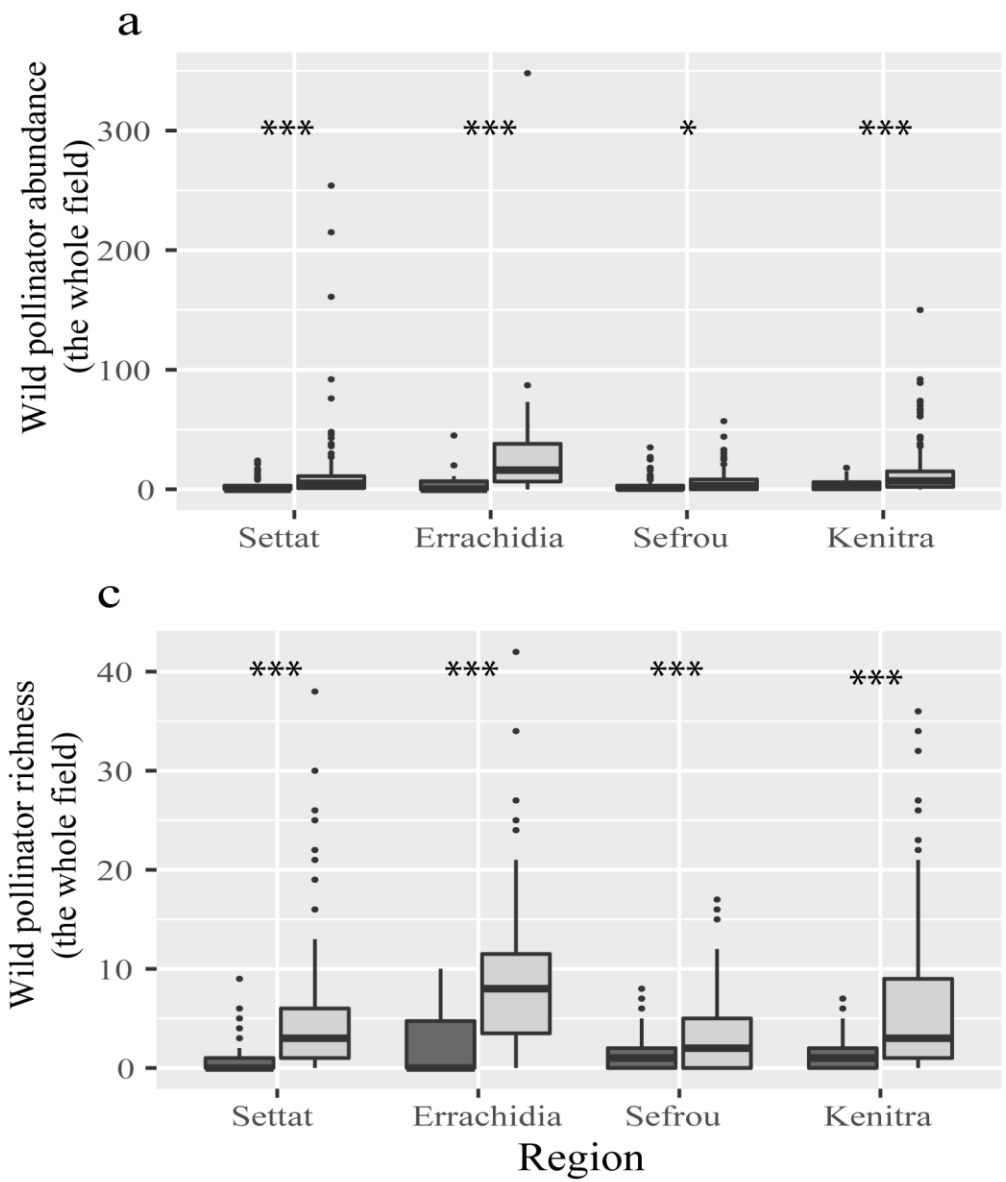

Oasis (Erfoud+Errich)

5 FAP fileds



3 control fileds

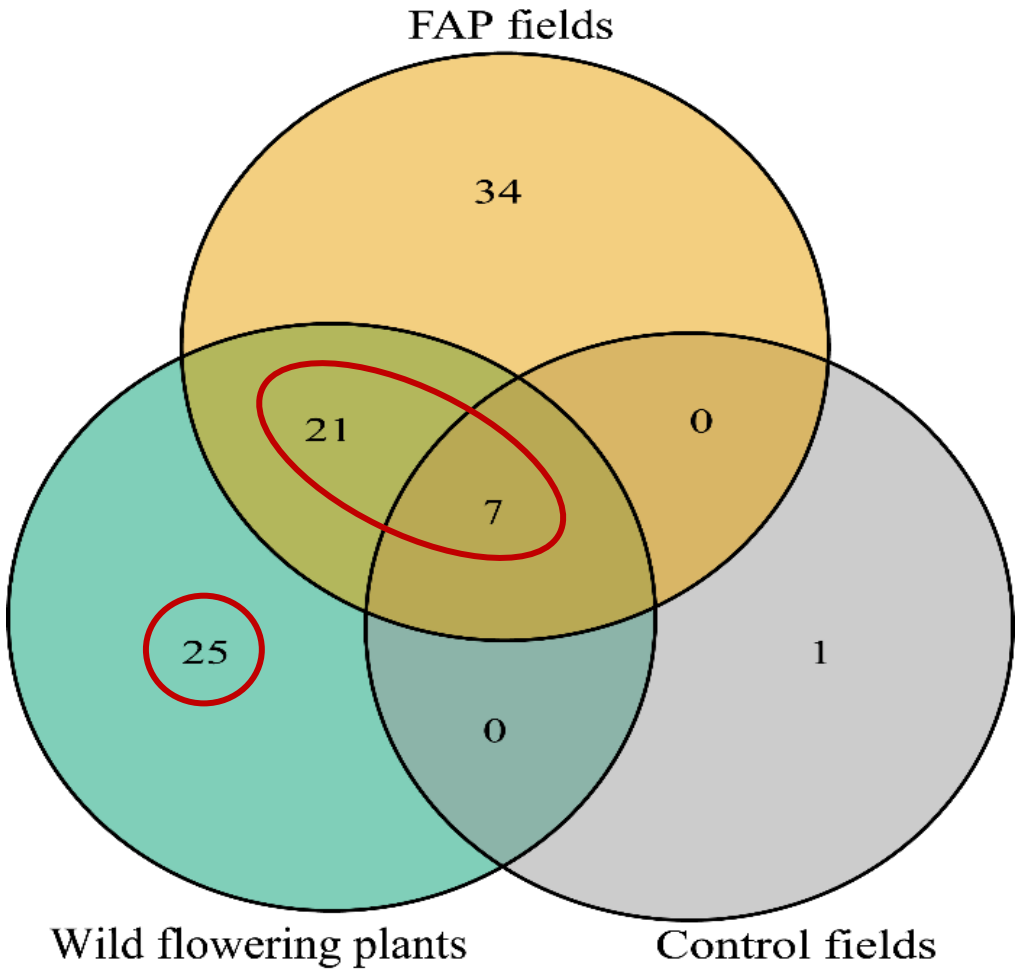



a
Wild pollinator abundance
(the whole field)
300
200
100
0
***
***
*
***
Settat
Errachidia
Sefrou
Kenitra
c
Wild pollinator richness
(the whole field)
40
30
20
10
0
***
***
***
***
Settat
Errachidia
Sefrou
Kenitra
Region

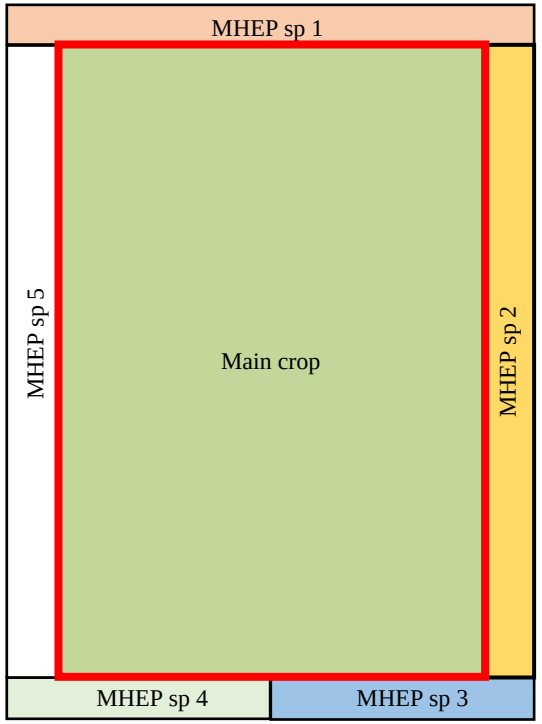
FAP

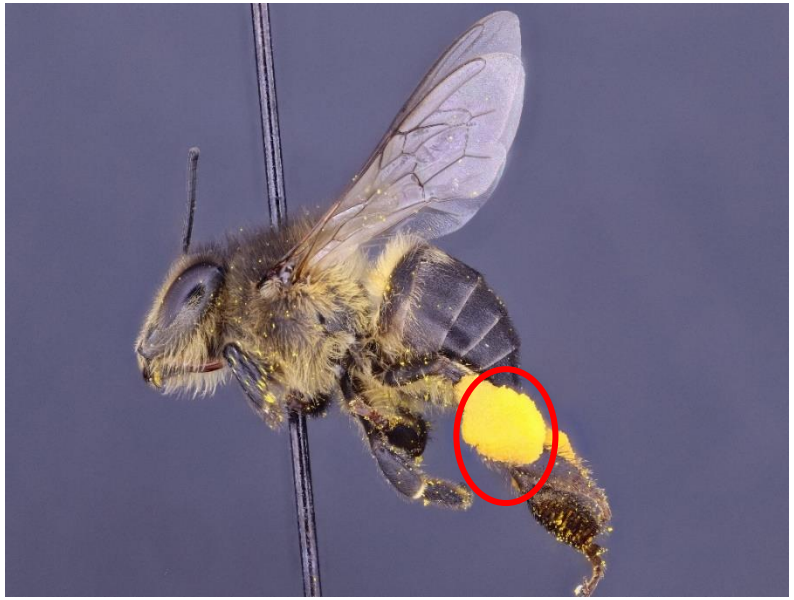
Control

Wild flowering plants


FAP fields
34
21
0
7
25
1
0
Wild flowering plants
Control fields

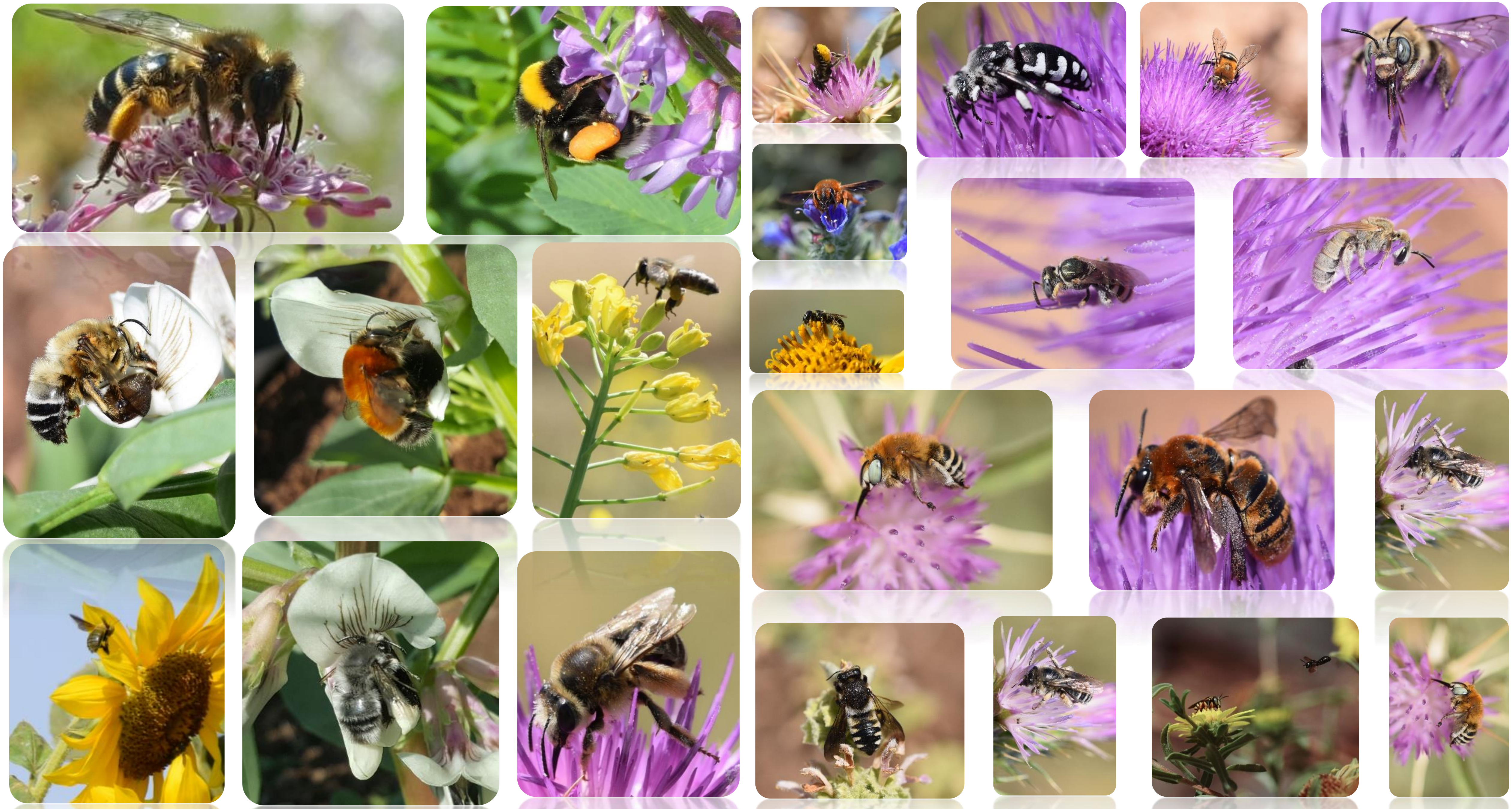
FAP field





35 % of the main crop pollinators collected pollen from MHEP

85 % collected pollen from the native wild flowering plants













Thank you!

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