Introductory training school on

POLLINATOR IDENTIFICATION

Marco **BONIFACINO**, Maarten **DE GROOT**,
Simone **FLAMINIO** & Hugo **GASPAR**

OUR ACTIVITIES

OUR ACTIVITIES

DAY 1

9h00	Welcome	
9h15	Pollinators: introduction	HYBRID
10h00	15' BREAK	
10h15	Introduction to butterflies	HYBRID
12h00	LUNCH	
13h00	Identification of butterflies and specimen preparation	
15h00	15' BREAK	
17h00	FINISH	

DAY 2

OUR ACTIVITIES

9h00	Introduction for bees: Biology, Ecology and Taxonomy	HYBRID
10h30	15' BREAK	
12h00	LUNCH	
13h00	Identification of bees	
15h00	15' BREAK	
17h00	FINISH	

DAY 3

OUR ACTIVITIES

9h00	Introduction to hoverflies	HYBRID
10h30	15' BREAK	
12h00	LUNCH	
13h00	Identification of hoverflies to tribe/genus level	
14h30	15' BREAK	
14h45	FINAL DISCUSSION	

MODULE 1 Introductory training school on pollinator identification

POLLINATORS

IMPORTANCE, MAIN GROUPS, CONSERVATION STATUS AND MONITORING METHODS

Hugo **GASPAR**

FLOWERLAB

CENTRE FOR FUNCTIONAL ECOLOGY

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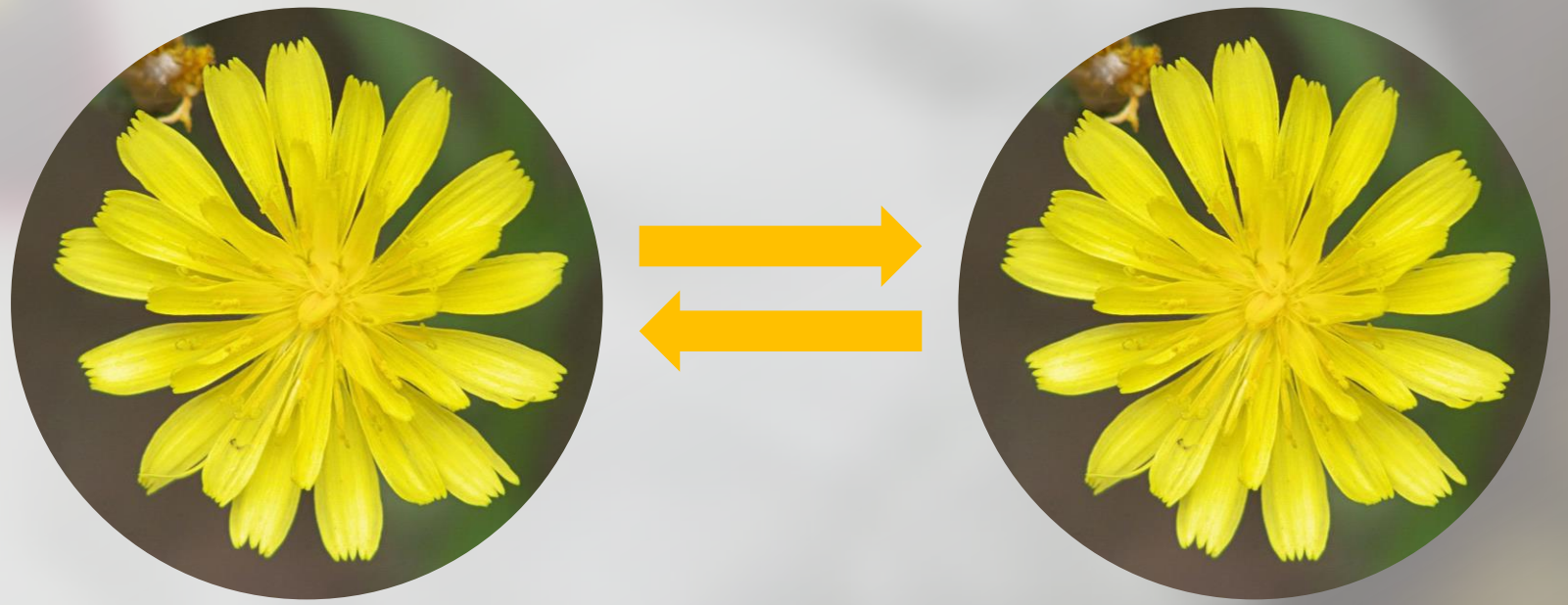
IMPORTANCE

INSECT POLLINATION

pollen transport

INSECT POLLINATION

pollen transport







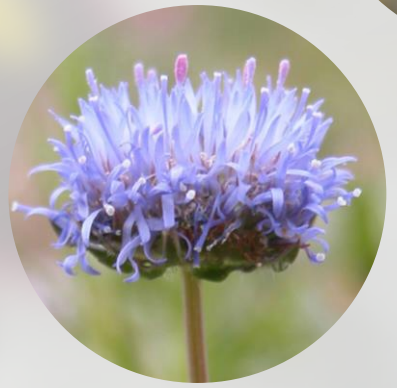


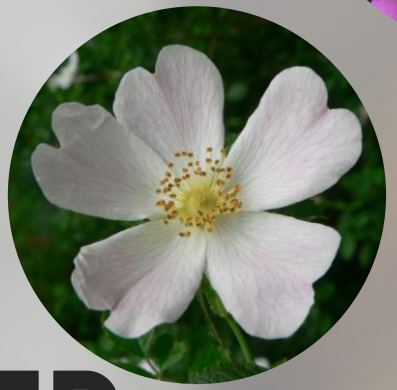






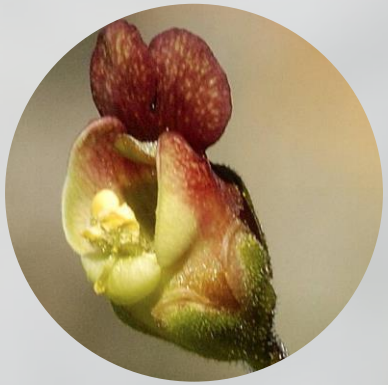






PLANTS WITH FLOWER

90% need animal vectors for pollen transport

color, shape, size, nectar and pollen content

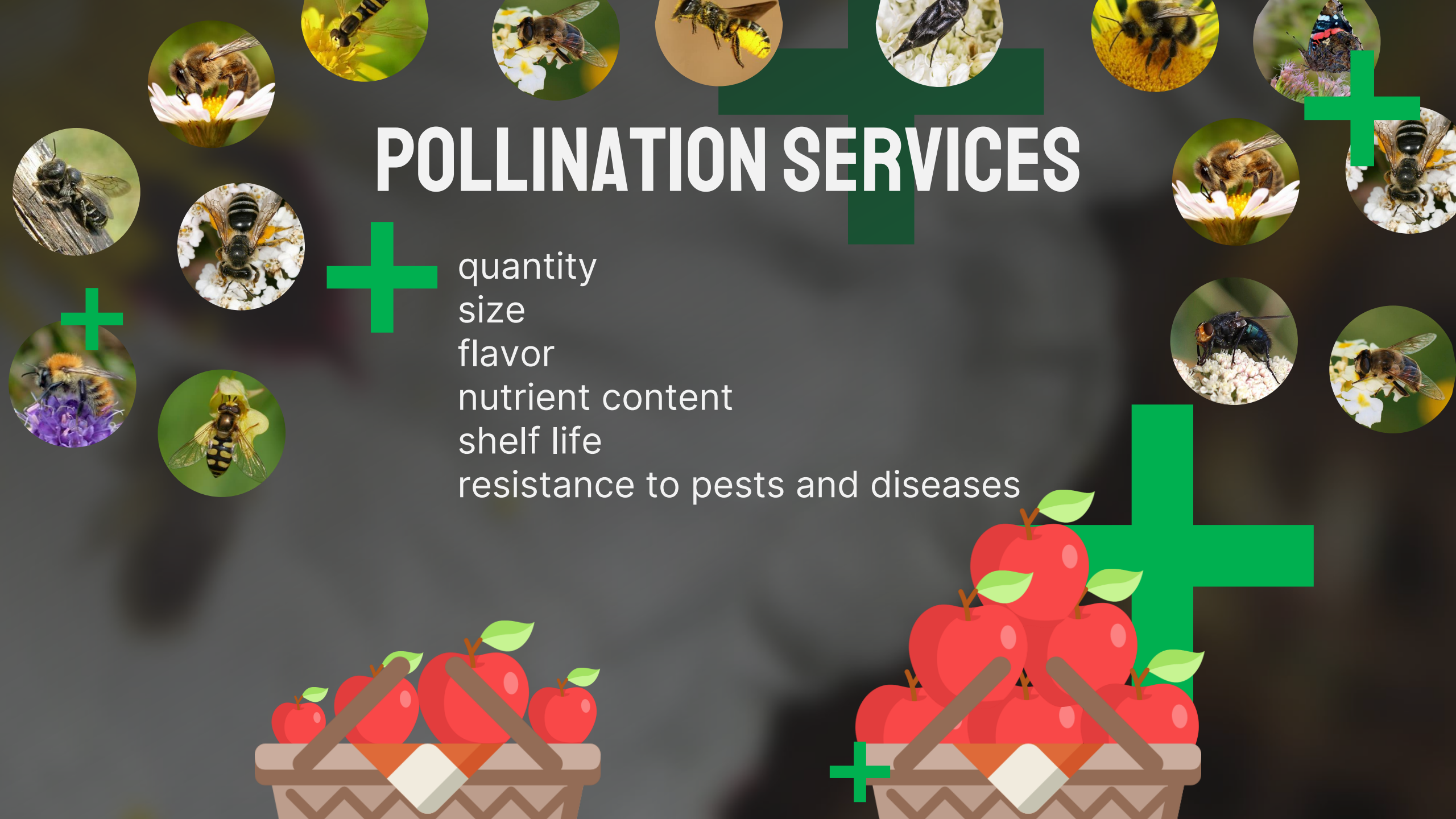






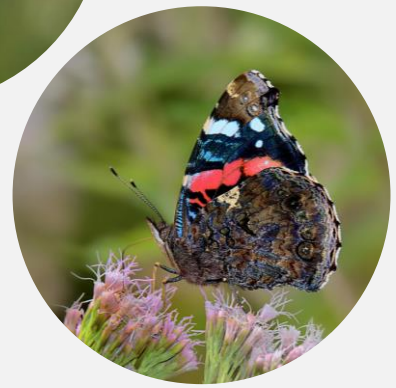

CROPS POLLINATED BY INSECTS

75% of the species used by humans


POLLINATION SERVICES
quantity
size
flavor
nutrient content
shelf life
resistance to pests and diseases

MAIN GROUPS









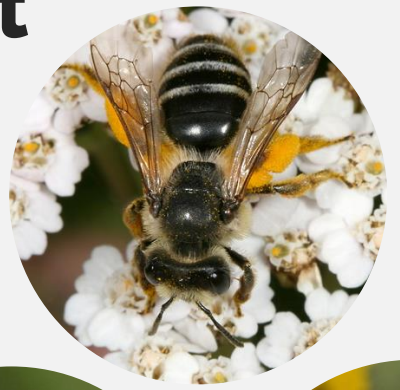

POLLEN or NECTAR FEEDING

with accidental pollen transport

thousands of species














WHO IS THE BEST POLLINATOR GROUP?





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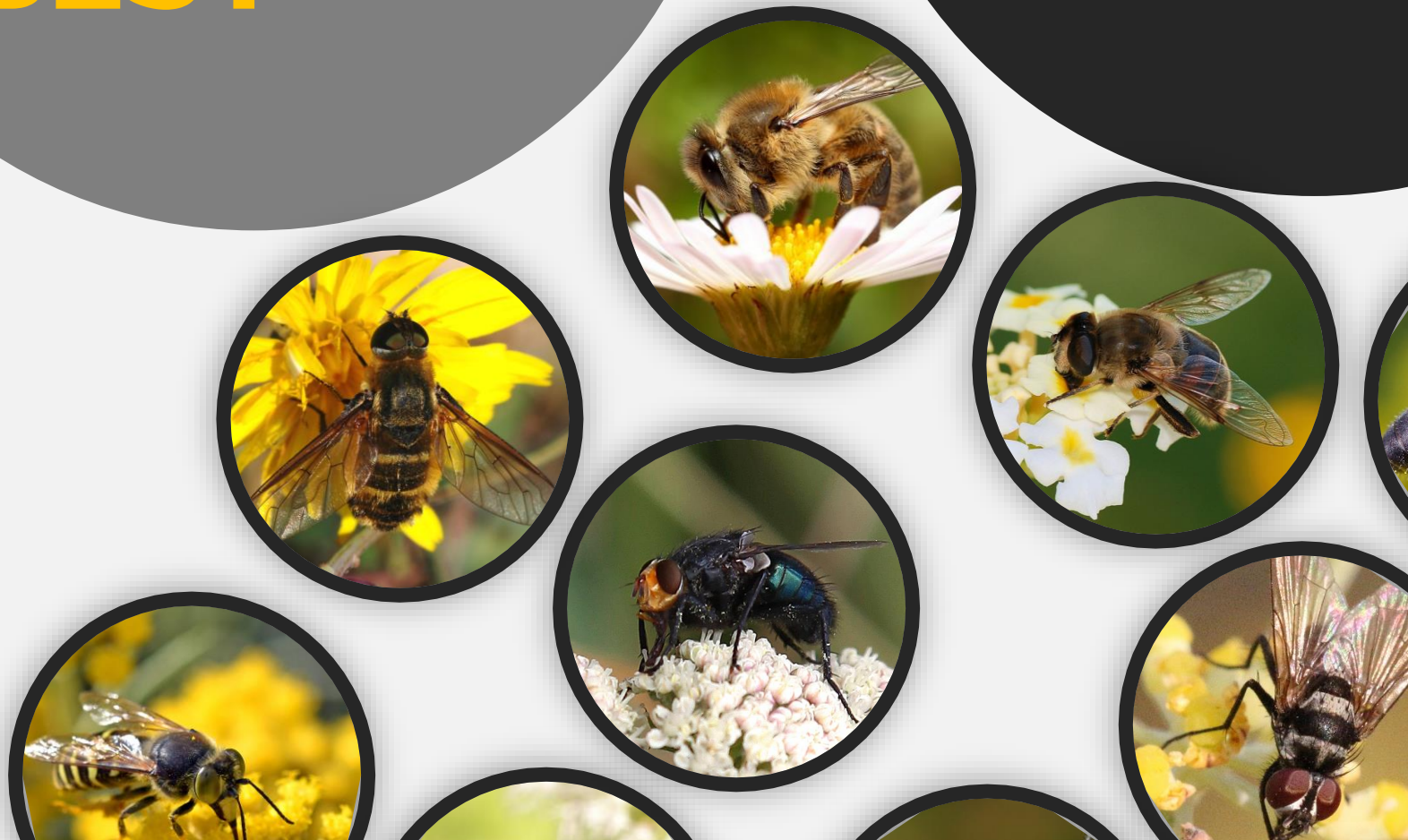
deposition capacity

WHO IS THE BEST POLLINATOR GROUP?

deposition capacity

visitation rate

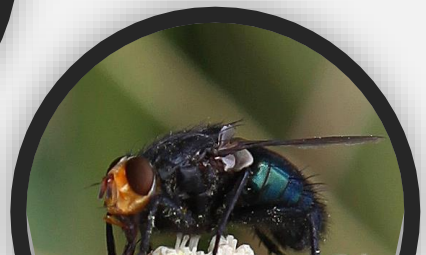


WHO IS THE BEST POLLINATOR GROUP?

deposition capacity

visitation rate

abundance



WHO IS THE BEST POLLINATOR GROUP?

MAIN POLLINATOR GROUPS

bees Anthophila:Hymenoptera
hoverflies Syrphidae:Diptera
diurnal butterflies Rhopalocera:Lepidoptera

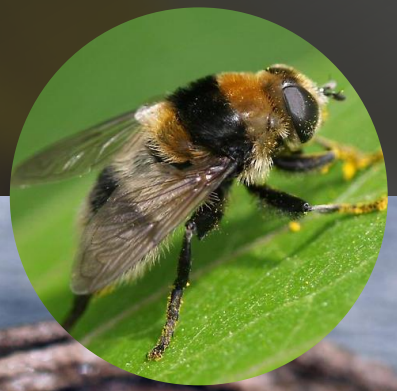
NEEDS FOR LIFE CYCLES

plant or animal food
shelter or nesting places
nesting materials

DAY 3

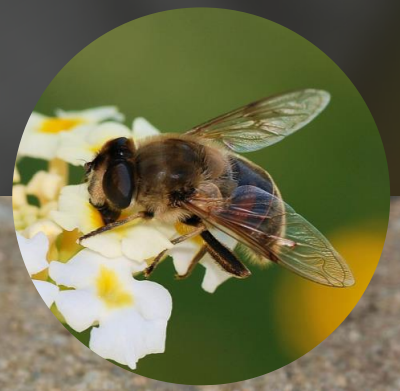
Maarten **DE GROOT**


+900



HERBIVORES

PREDATORS

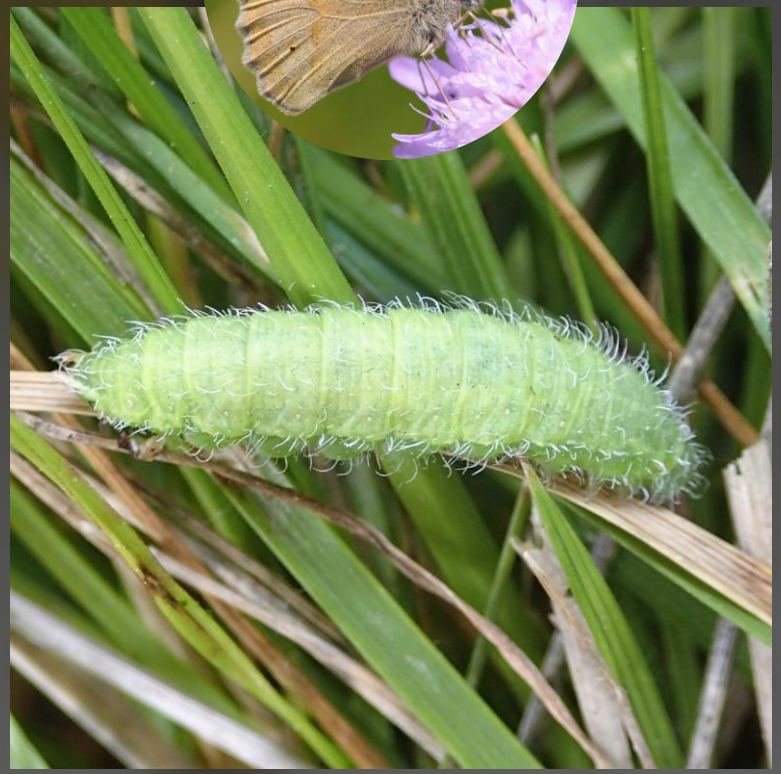


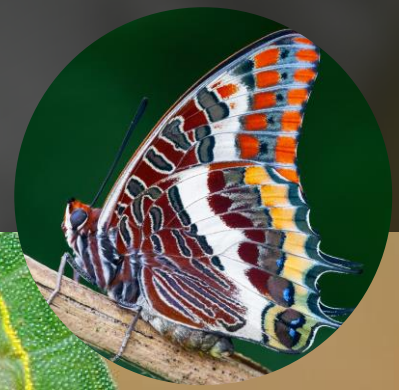
DETRITIVORES

DAY 1

Marco **BONIFACINO**


+450


DAY 2

Simone **FLAMINIO** &
Hugo **GASPAR**


+2000

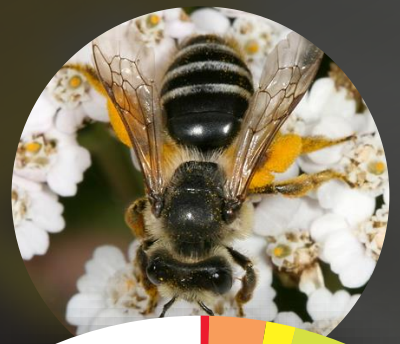
ONLY FEEDS ON POLLEN OR NECTAR

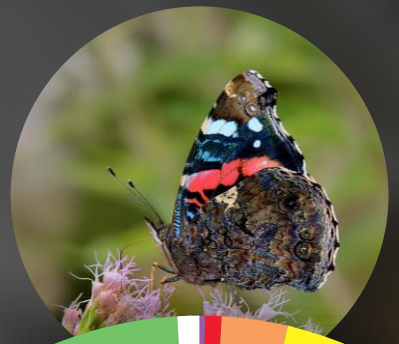
CARNIVORE LARVAE

PREDATORY LARVAE

PARASITOID LARVAE

CONSERVATION STATUS





2014

2022

2010

Data Deficient

Least Concern

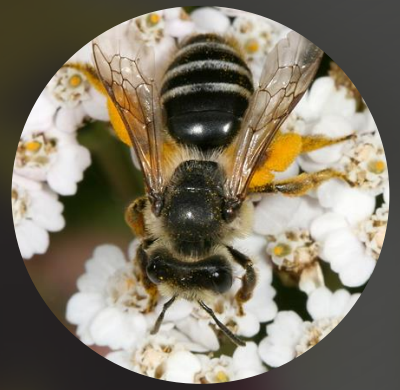
Near Threatened

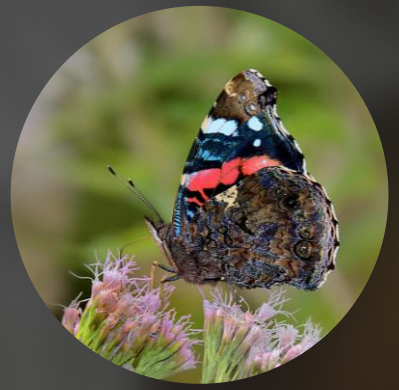
Vulnerable

Endangered

Critically endangered

Regionally extinct





LOSS OF HABITAT AND CONNECTIVITY

AGRICULTURAL INTENSIFICATION OR ABANDONMENT

CLIMATE CHANGE

INTENSIFICATION OF HUMAN RELATED DEVELOPMENT

MONITORING METHODS



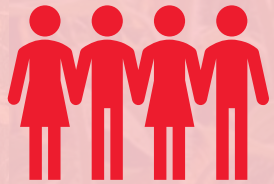
target group

identification level

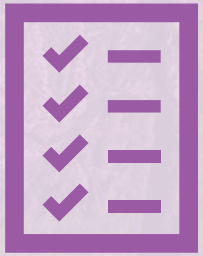
pollen analysis

plant type

spatial and temporal **scales**



available **workforce**



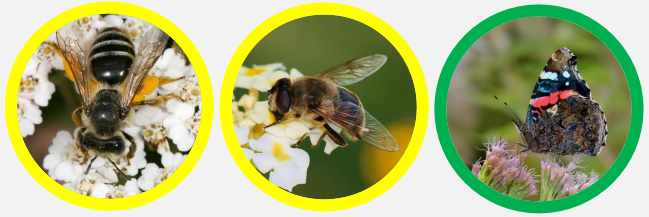
record **interaction**

abundance

diversity

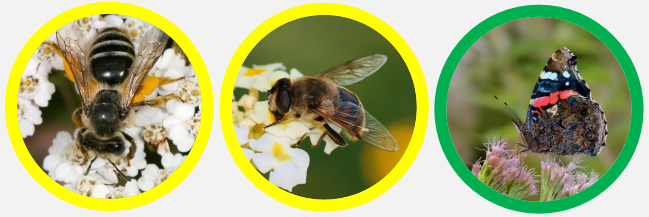
OBSERVATION

flower patch
transept



OBSERVATION

flower patch
transept



\+

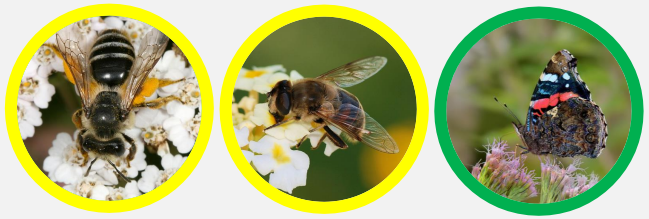
plant-poll interaction
(visitation rate, behavior)

non lethal

no special material

OBSERVATION

flower patch transept



\+ plant-poll interaction (visitation rate, behavior)

non lethal

no special material

\- limited identification (user bias, big insects)

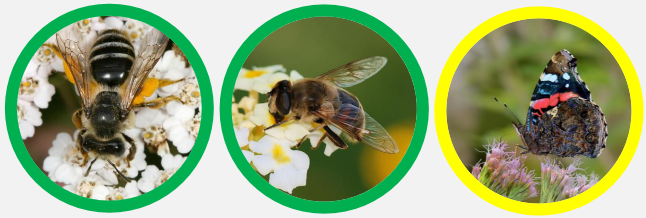
mostly hard to fly away species

very time consuming

NETTING

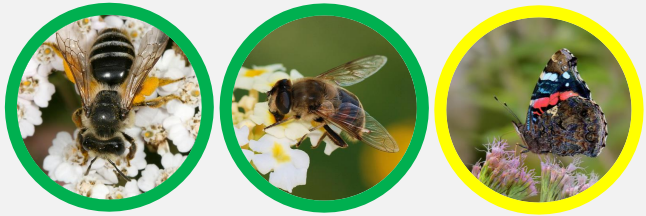
targeted

sweep



NETTING

targeted sweep



\+

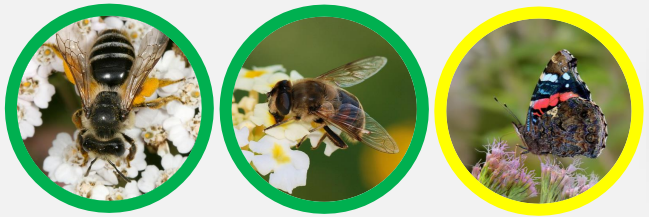
specimen selection

gets easy to fly away species

lab identification

NETTING

targeted sweep



\+ specimen selection

gets easy to fly away species

lab identification

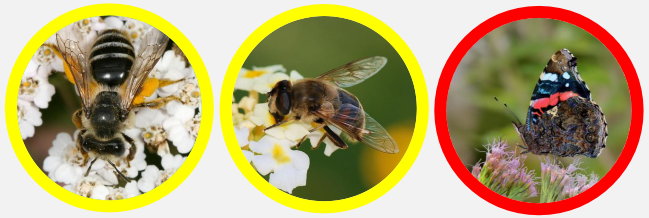
− high sampling effort

sweep without interaction

lethal method (most times)

PAN-TRAP

PAN-TRAP



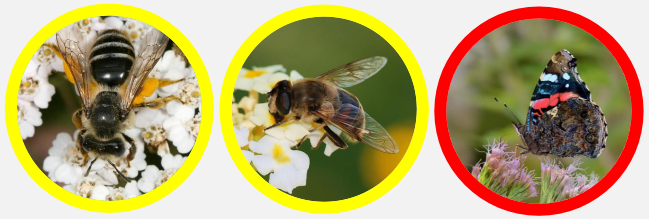
+

large spatial and temporal scales

gets easy to fly away species

lab identification

PAN-TRAP



\+ large spatial and temporal scales

gets easy to fly away species

lab identification

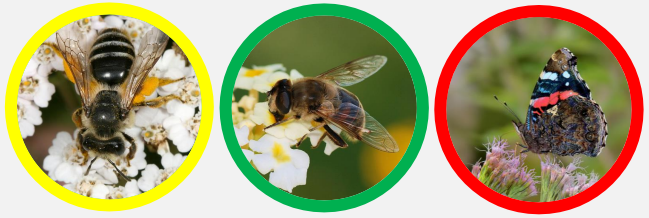
\- specimen poor condition

no plant-poll interaction

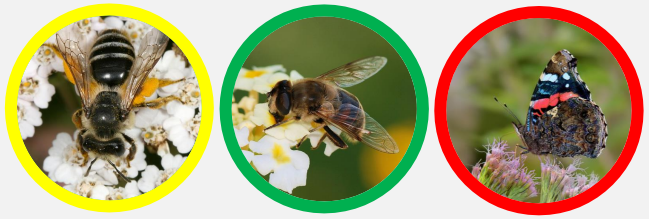
bias towards some species

lethal method

MALAISE-TRAP



MALAISE-TRAP



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lab identification

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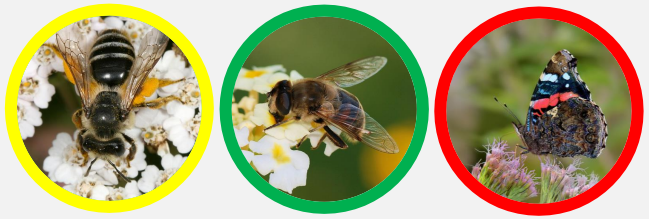


\+ large spatial and temporal scales

gets easy to fly away species

lab identification

\- specimen poor condition

no plant-poll interaction

bias towards some species

lethal method

WHAT TO CHOOSE ?

plant-poll interaction

taxonomic identification

visitation rates

not bias for some species

data/sampling effort ratio

WHAT TO CHOOSE ?

plant-poll interaction

taxonomic identification

visitation rates

not bias for some species

data/sampling effort ratio

ENTOMOLOGICAL COLLECTIONS

location with coordinates
date of collection
collector
individual code

location with coordinates
date of collection
collector
individual code

capture method
plant where it was caught on
habitat description

PRODUCE KNOWLEDGE

location with coordinat
date of collecti
collect
individual co

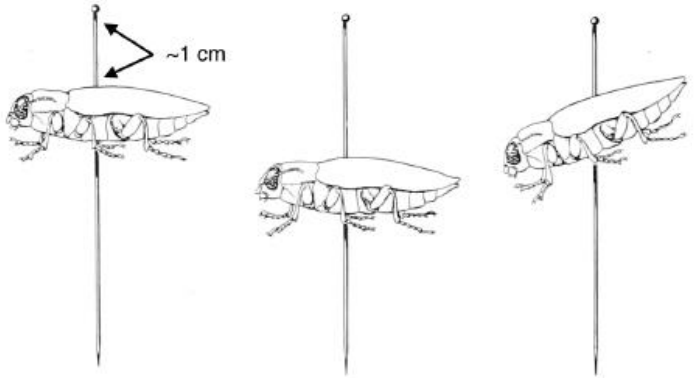
capture method
plant where it was caught on
habitat description

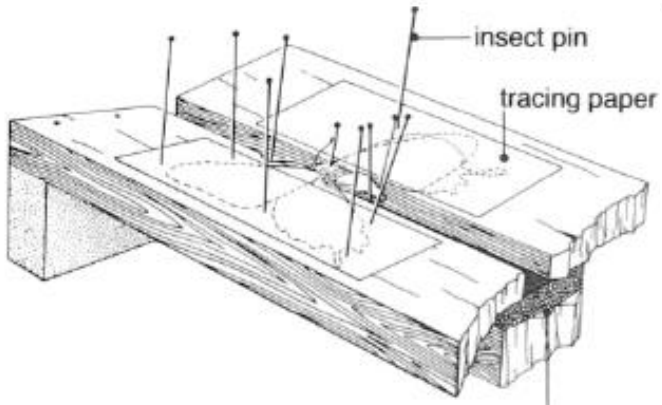
distribution
diet
taxonomy
ecology
reference material

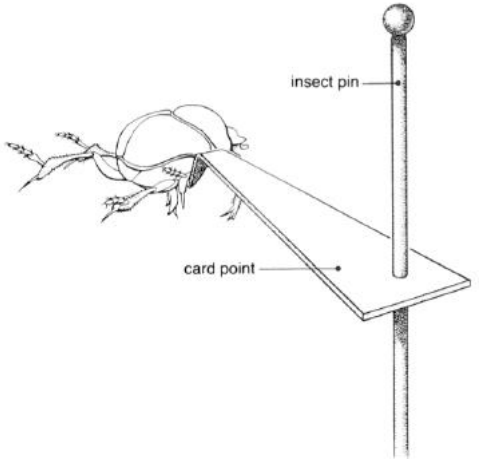

HOW TO PIN THEM?

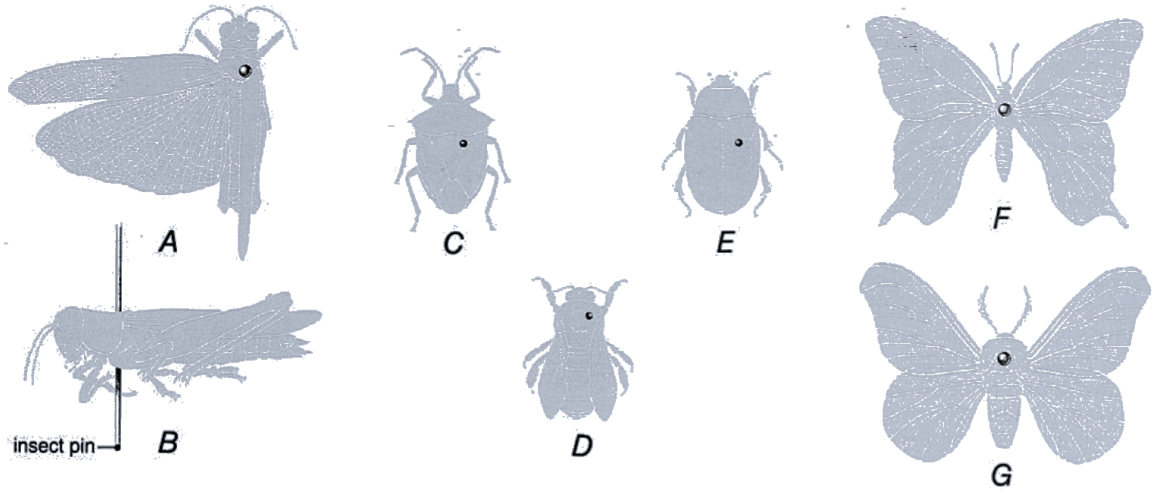
HOW TO PIN THEM?

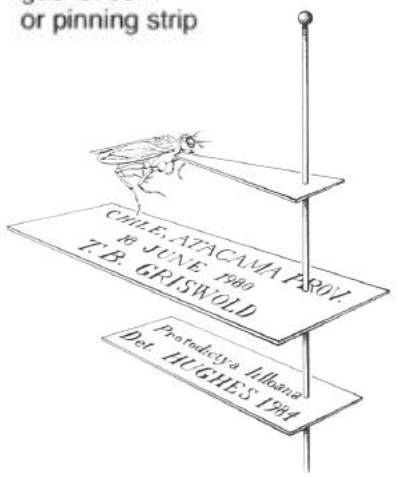
2017. Frost Entomological Museum. SOP 03: Specimen Preparation Guide
1997?. Schauff, M. E.. Collecting and preserving Insects and mites: Techniques and tools

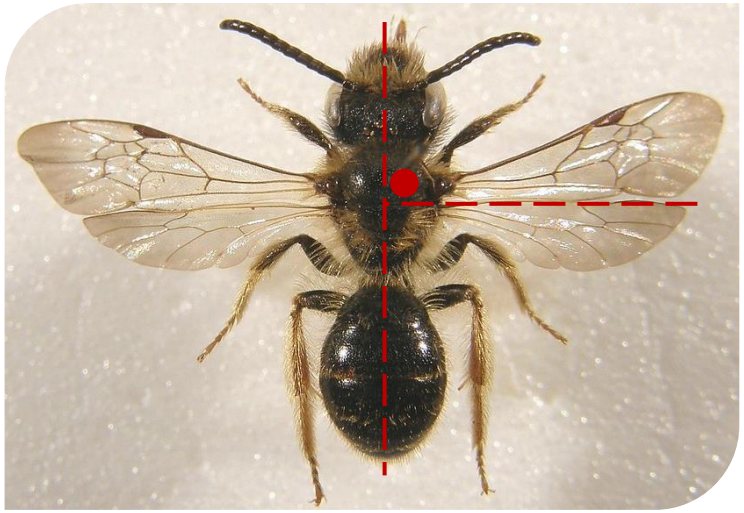






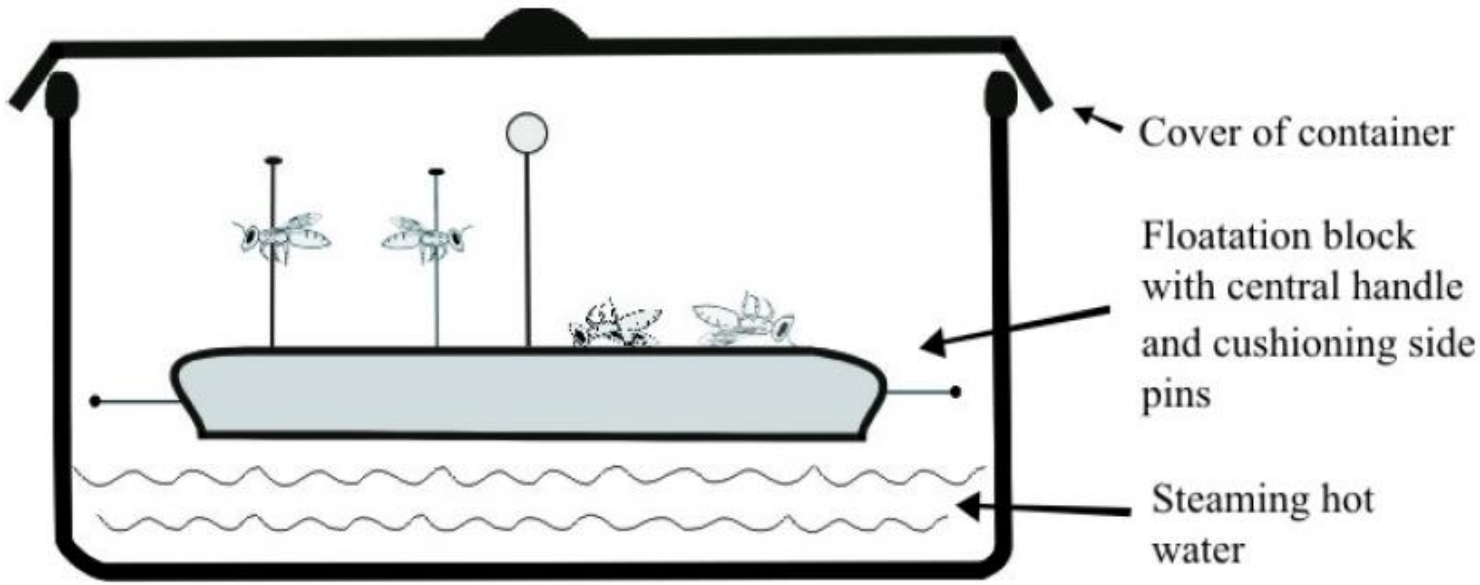


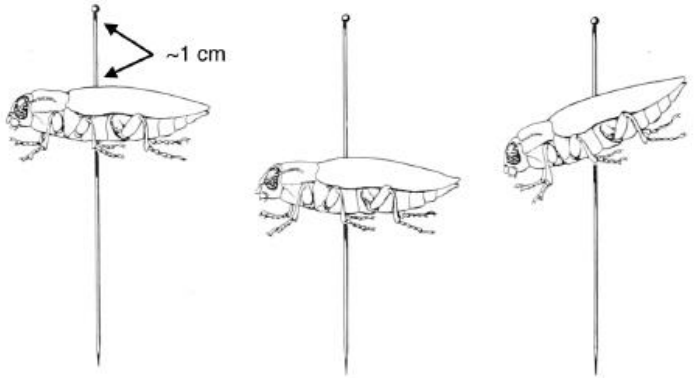


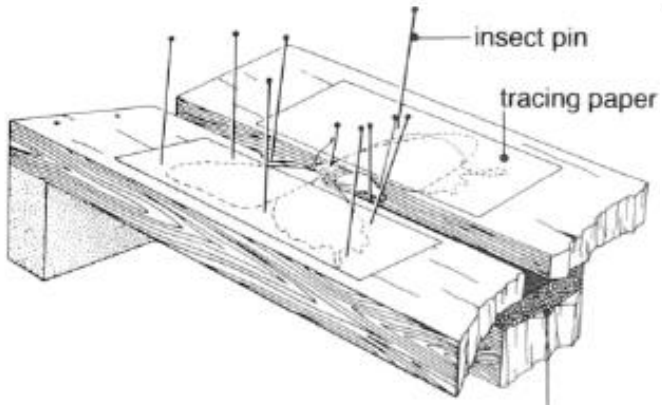


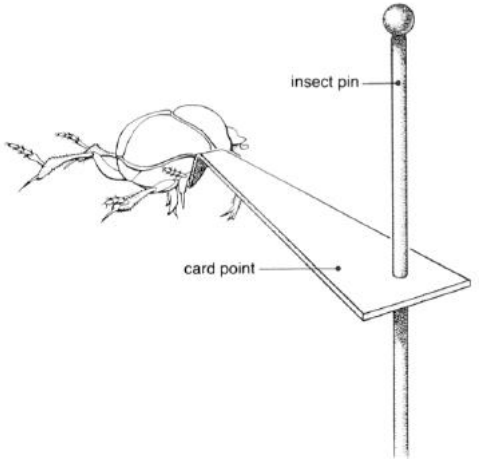
PERIODIC INSPECTION, IF NEEDED, FREEZING TREATMENTS

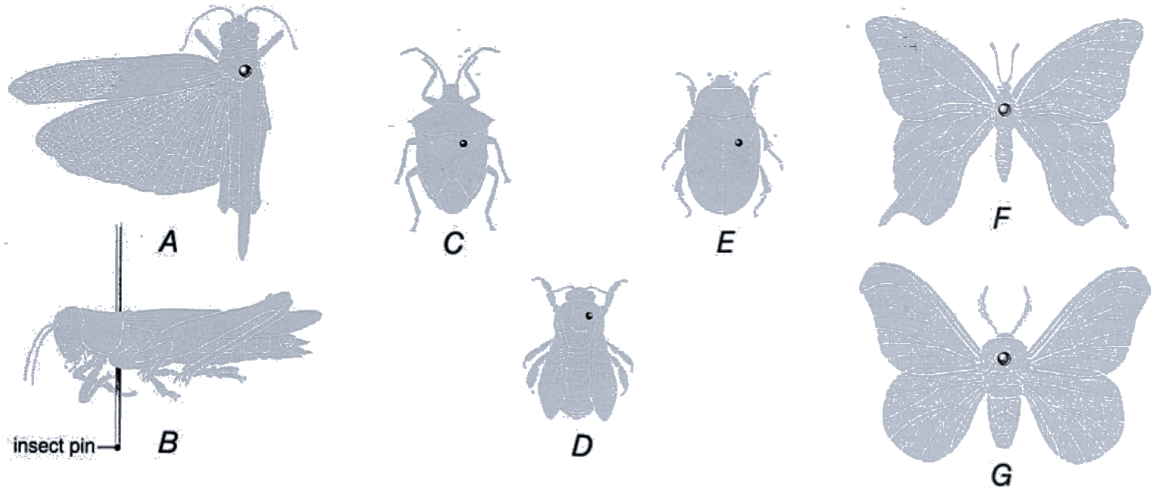
CONSTANT TEMPERATURE AND HUMIDITY, ISOLATED

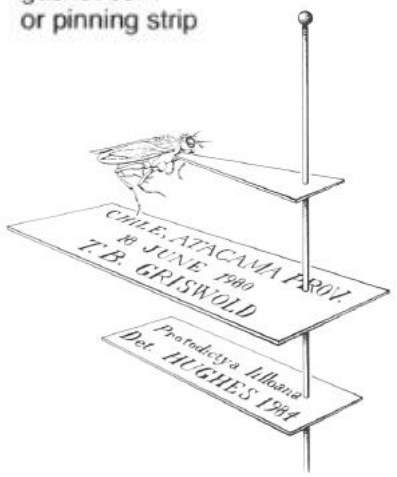

Cover of container
Floatation block with central handle and cushioning side pins
Steaming hot water

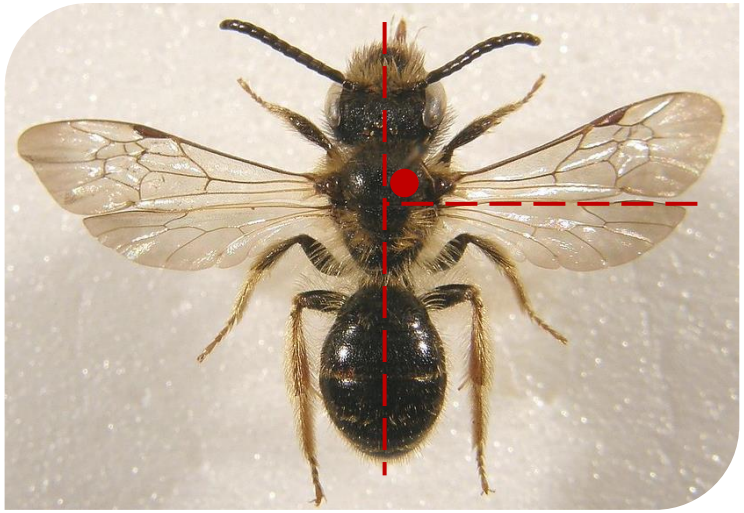












PERIODIC INSPECTION, IF NEEDED, FREEZING TREATMENTS

CONSTANT TEMPERATURE AND HUMIDITY, ISOLATED

MODULE 1 Introductory training school on pollinator identification

POLLINATORS

IMPORTANCE, MAIN GROUPS, CONSERVATION STATUS AND MONITORING METHODS

Hugo **GASPAR**

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