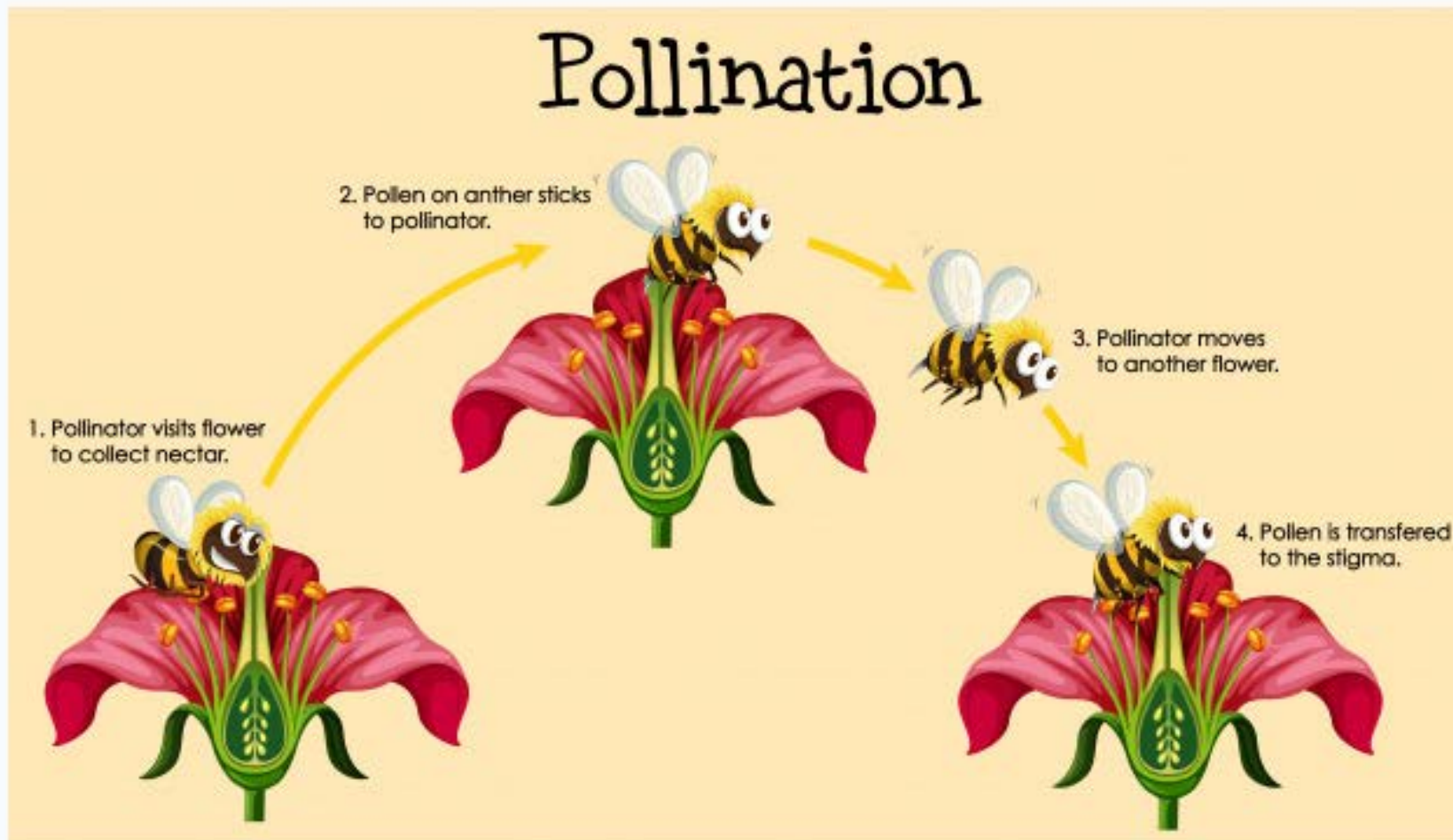


The importance of pollinators to humans and the environment



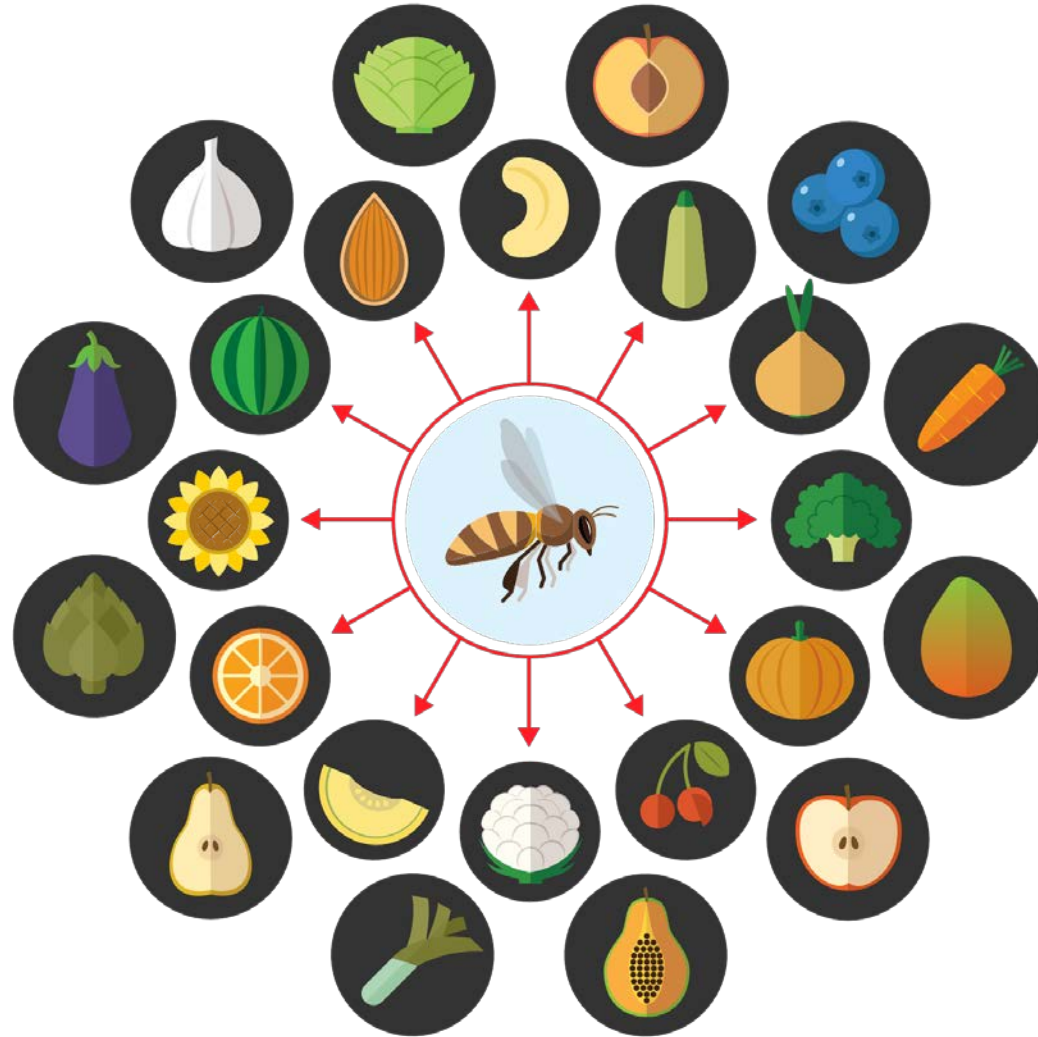
A.I. Varnava, M.C. Stavrinides
Sustainable Agriculture Group, Cyprus University of Technology

Pollination: Transfer of pollen



Pollinators are crucial

**75% of
commodities
benefit from
insect
pollination**



**270-670 bill.
USD annually**

**Cyprus: 60
mill. euros
annually**

SOURCE: REPORTING BY S. PAIN

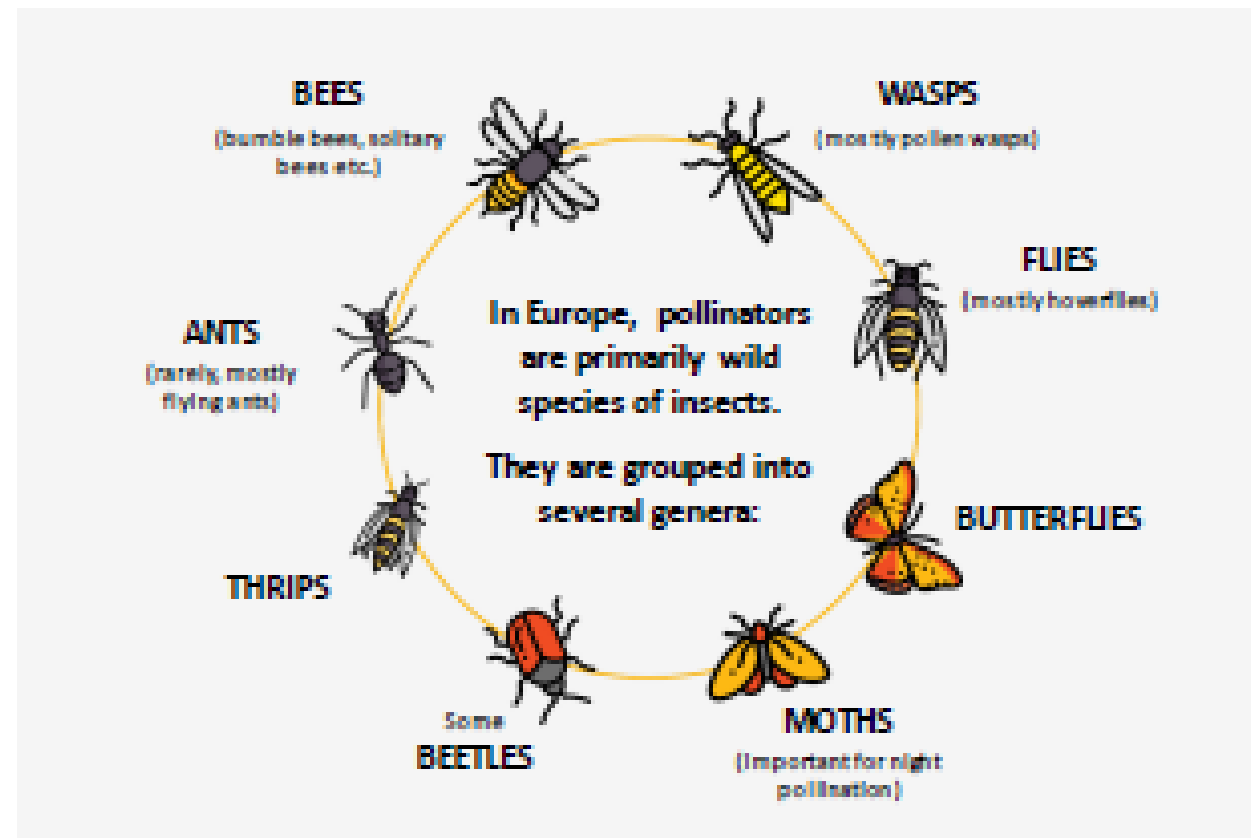
5W INFOGRAPHIC / KNOWABLE

(Guimarães Porto et. al, 2020; ΤΓ)

Which are the main pollinator groups?

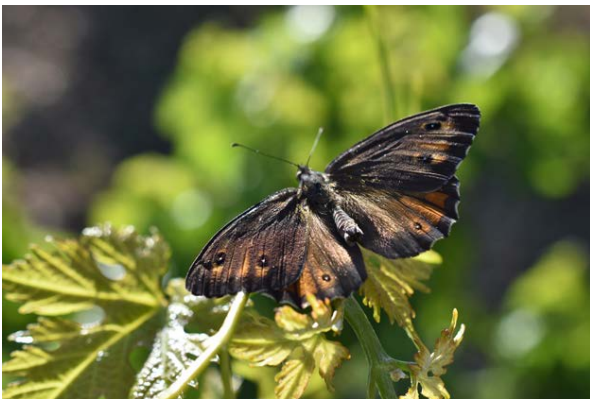


- Insects, bats, birds, small mammals

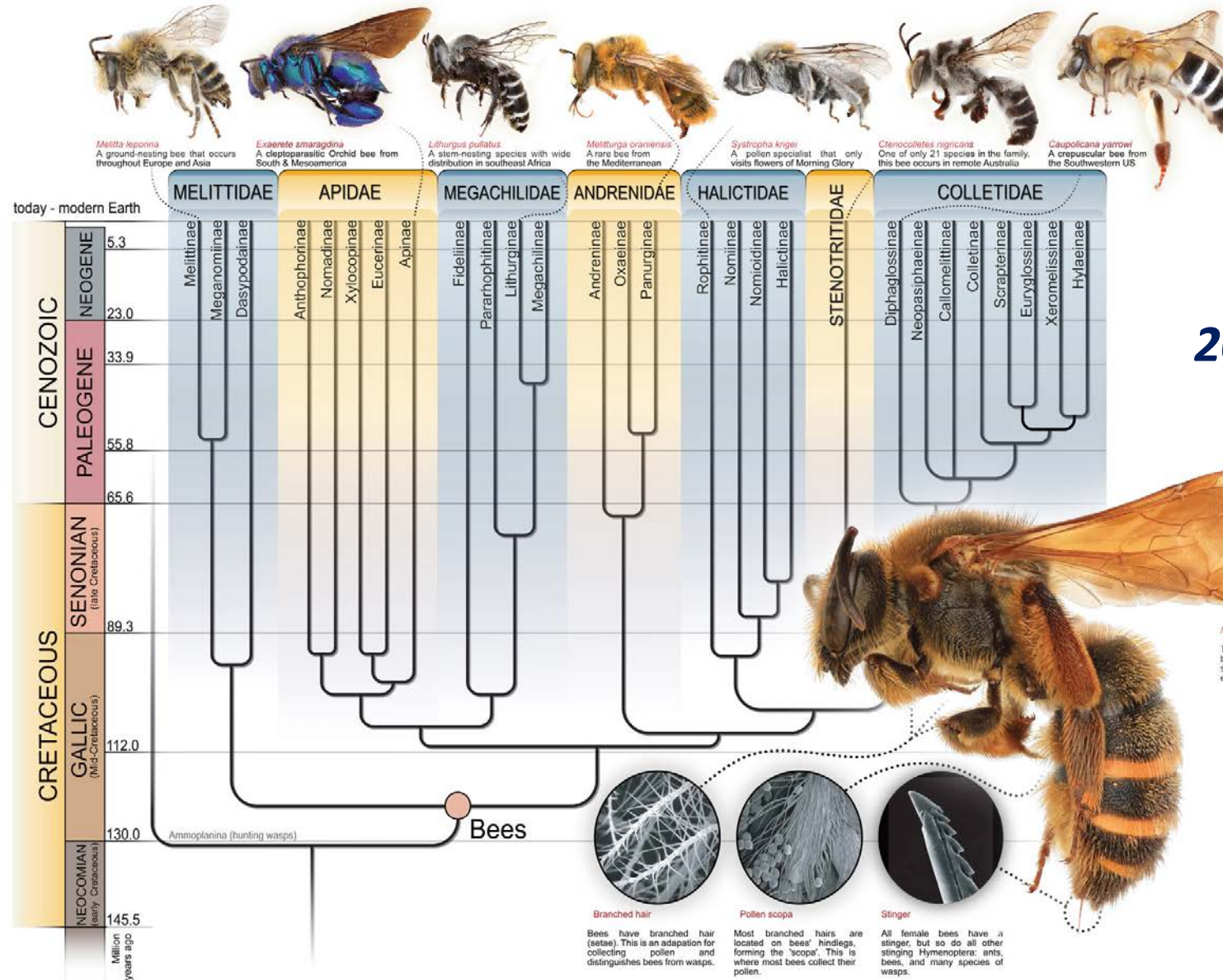


Pollination by butterflies

- ❖ Butterflies feed with nectar from flowers using their long proboscis.
- ❖ In the process, they transfer pollen which sticks to their bodies from flower to flower

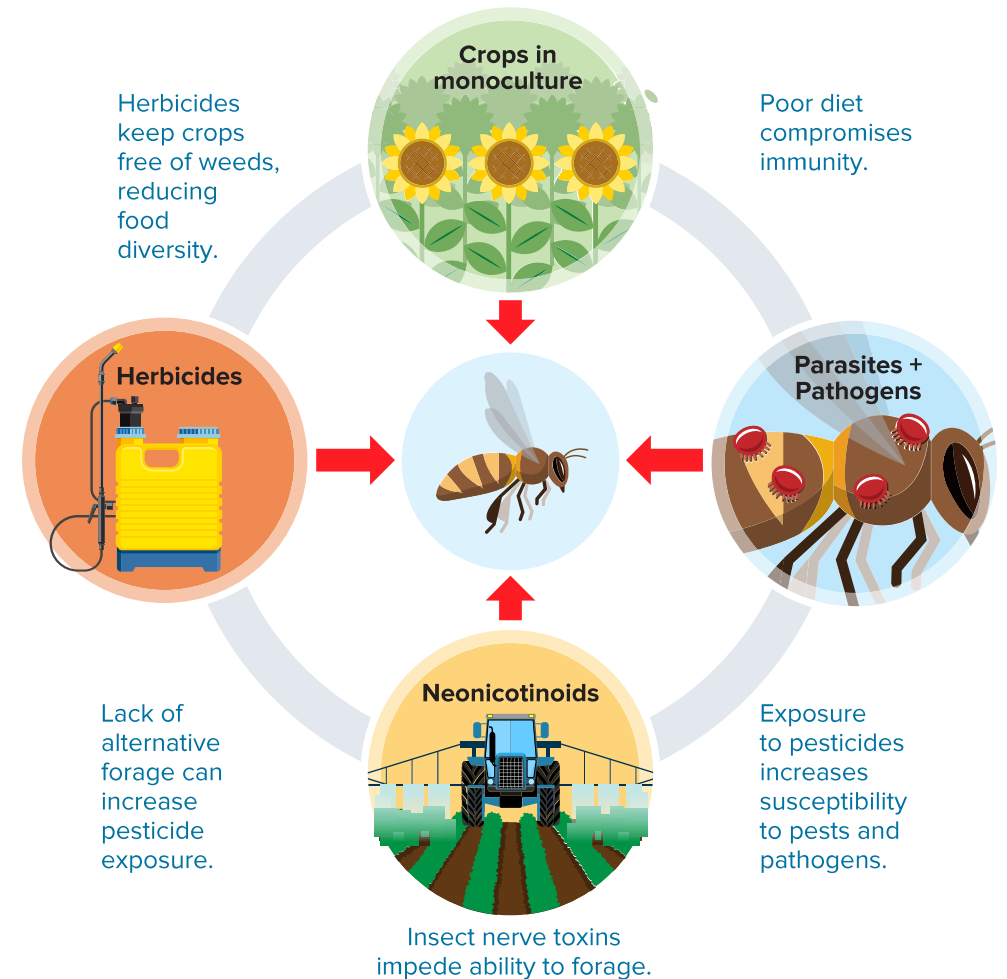


Bees – The most important group of pollinators



20,000+ bee species

Apis mellifera: The champion is threatened

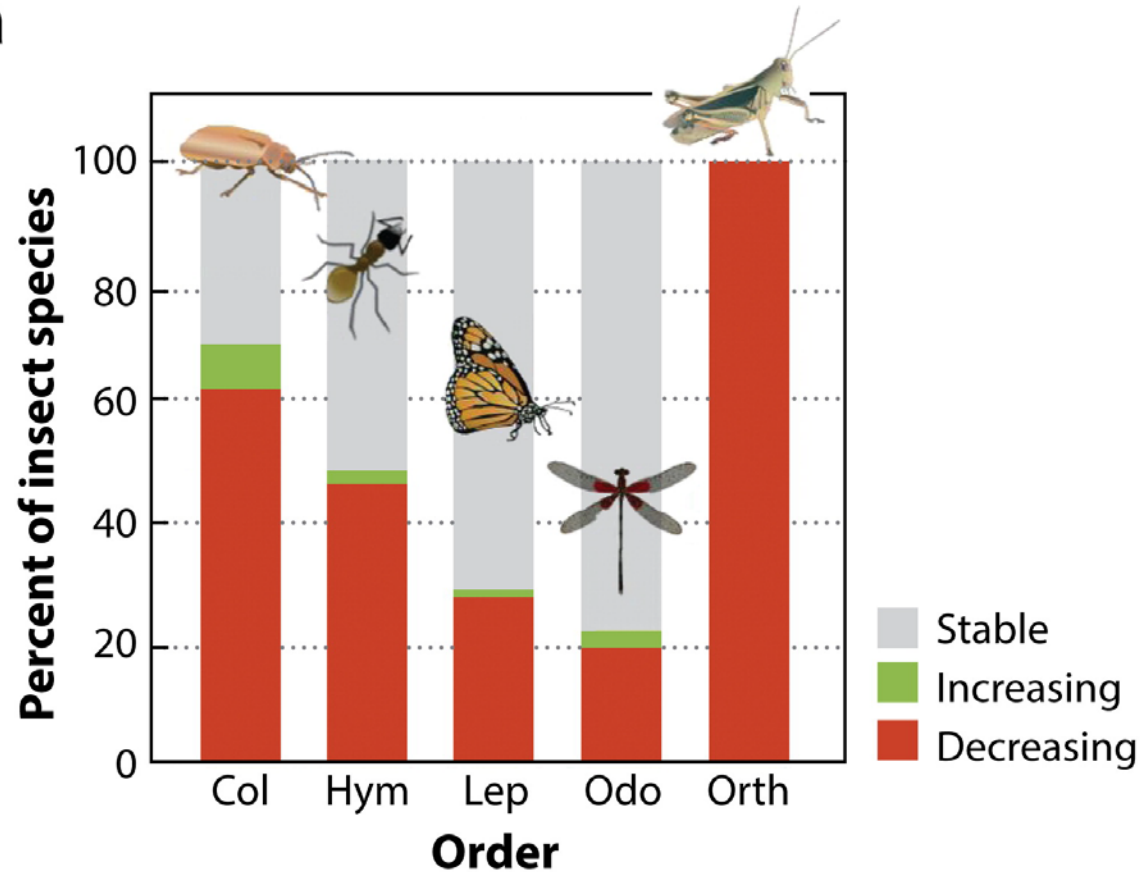


SOURCE: D. GOULSON ET AL / SCIENCE 2015, REPORTING BY S. PAIN

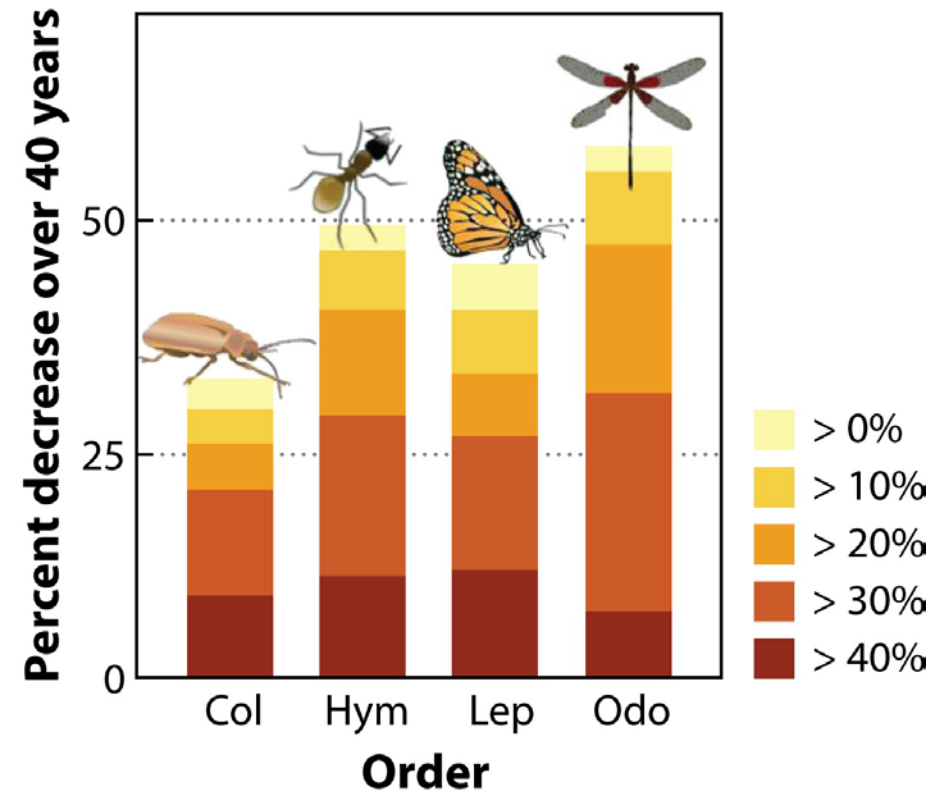
5W INFOGRAPHIC / KNOWABLE

The populations of bees and other pollinators are in a dramatic decline

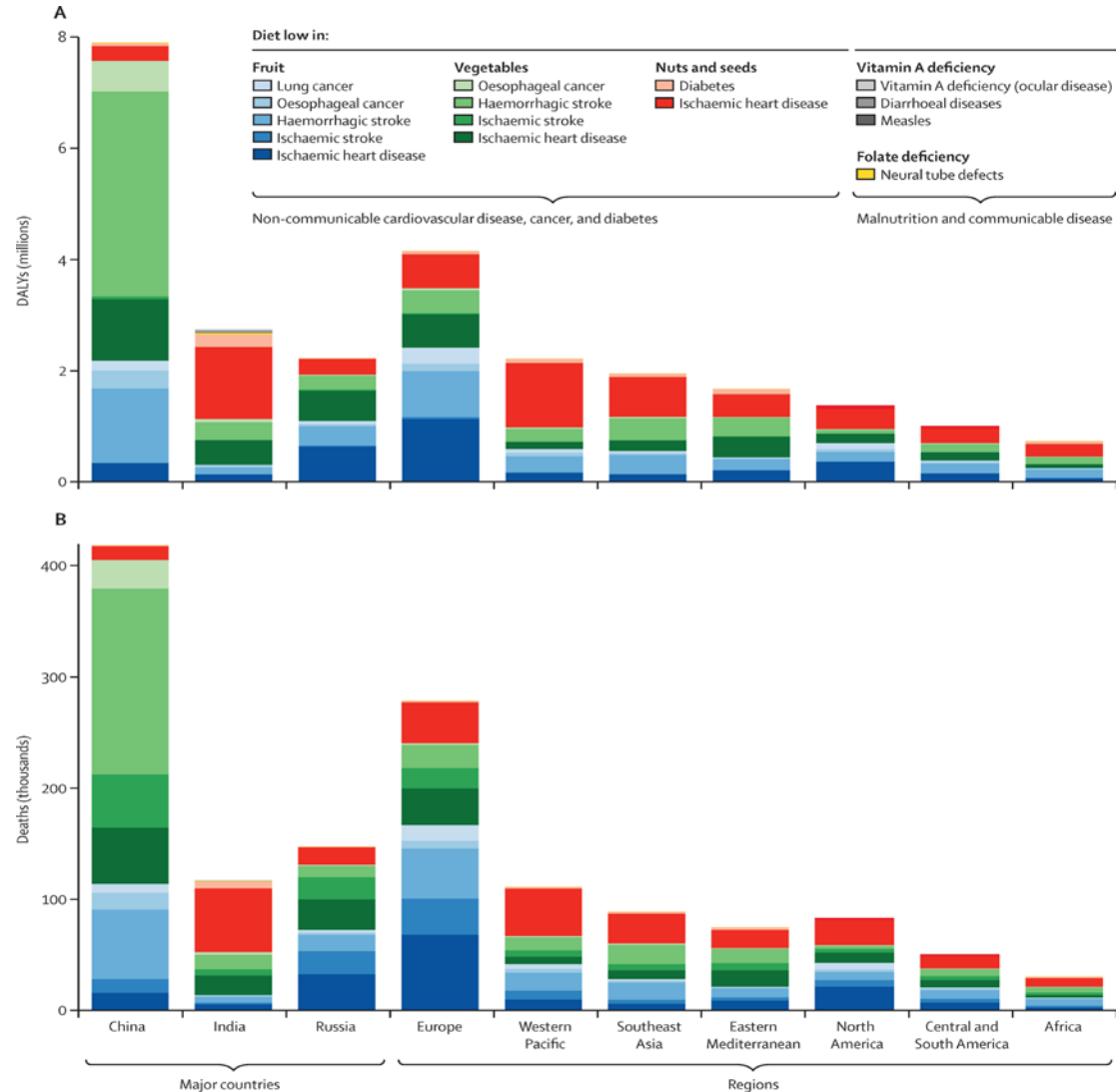
a



b



Extinction of bees and other pollinators will have serious consequences for human health

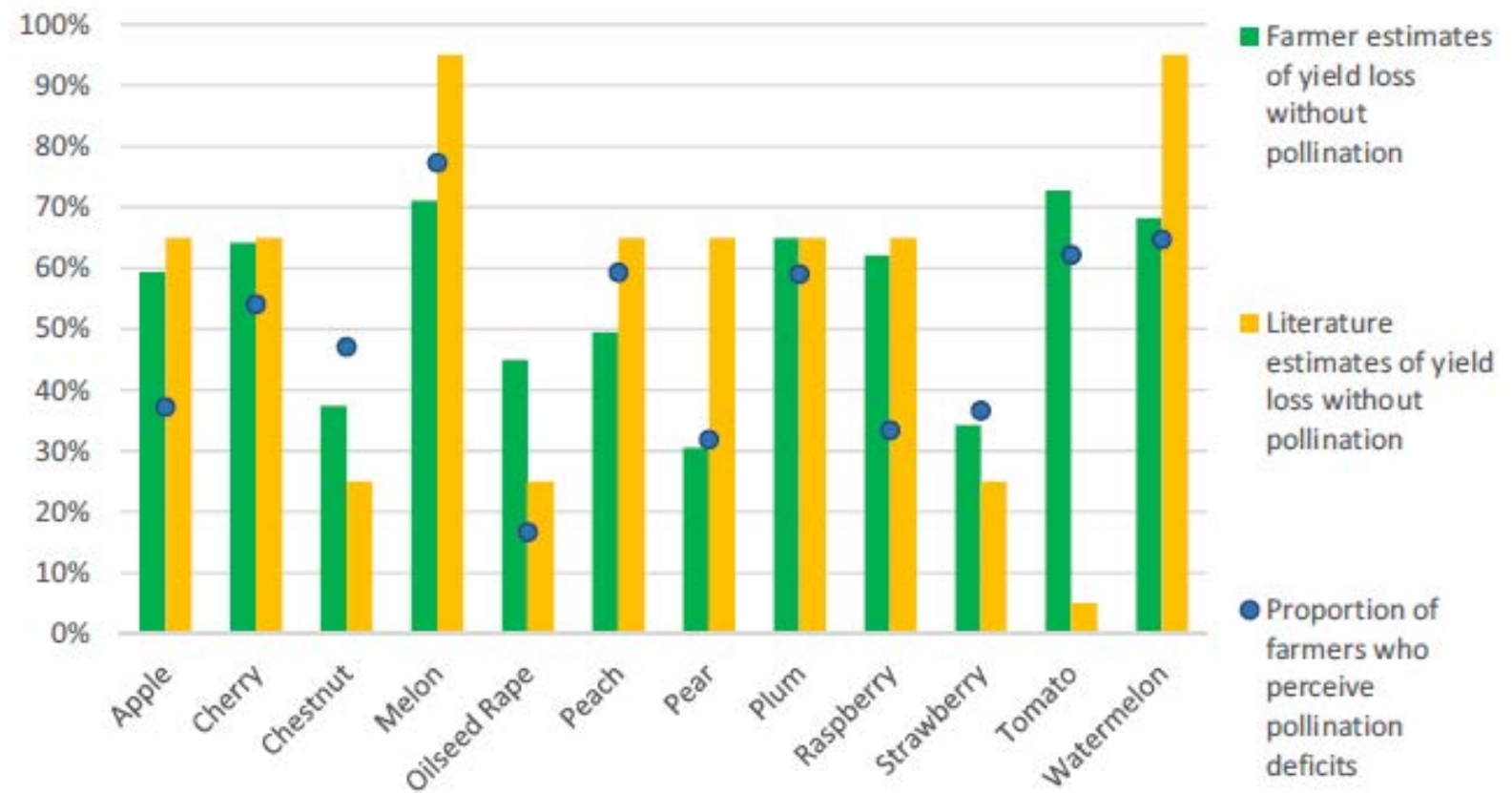


- Increase in deaths and disability-adjusted life years because of poor nutrition



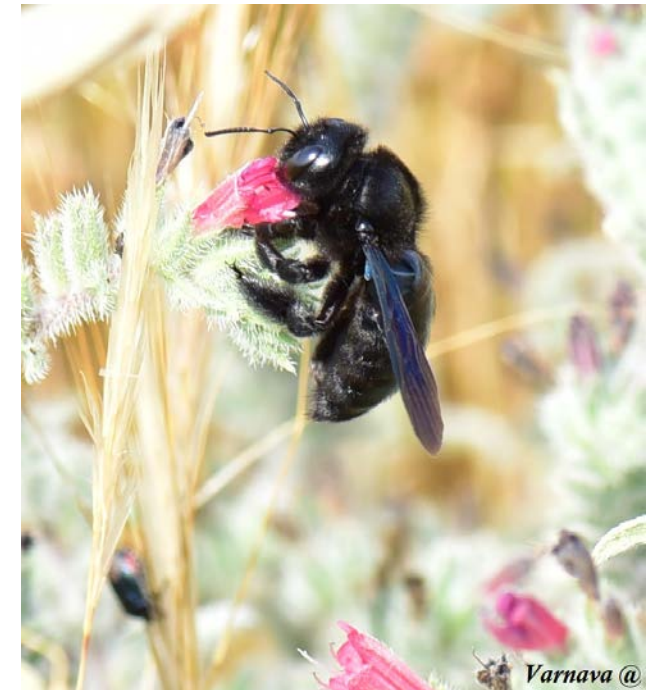
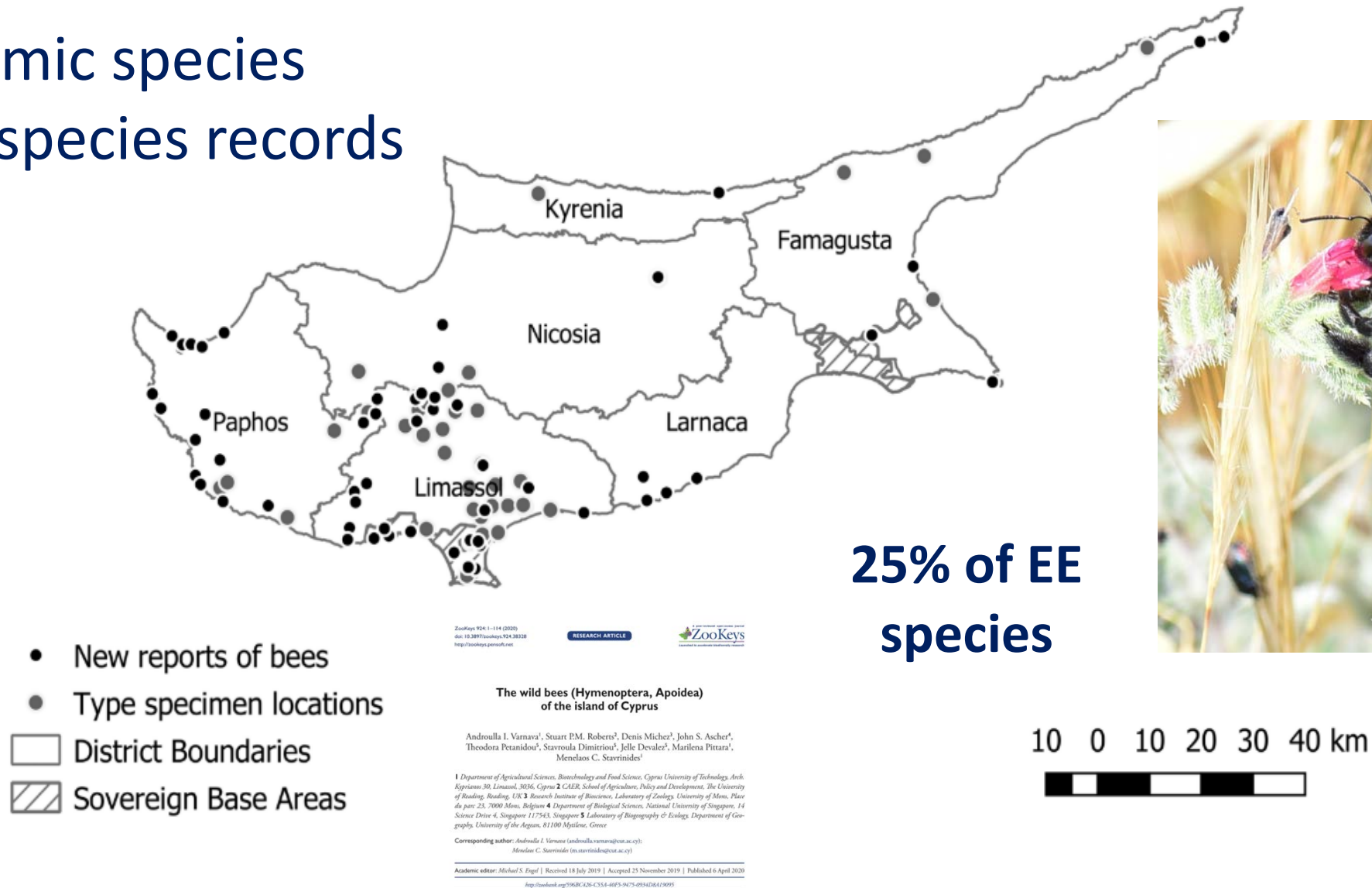
Smith et al. 2105

Farmers believe that their crops are not sufficiently pollinated



Cyprus hosts a high diversity of wild bees – 369 species, 3rd in Mediterranean

- 21 endemic species
- 11 new species records



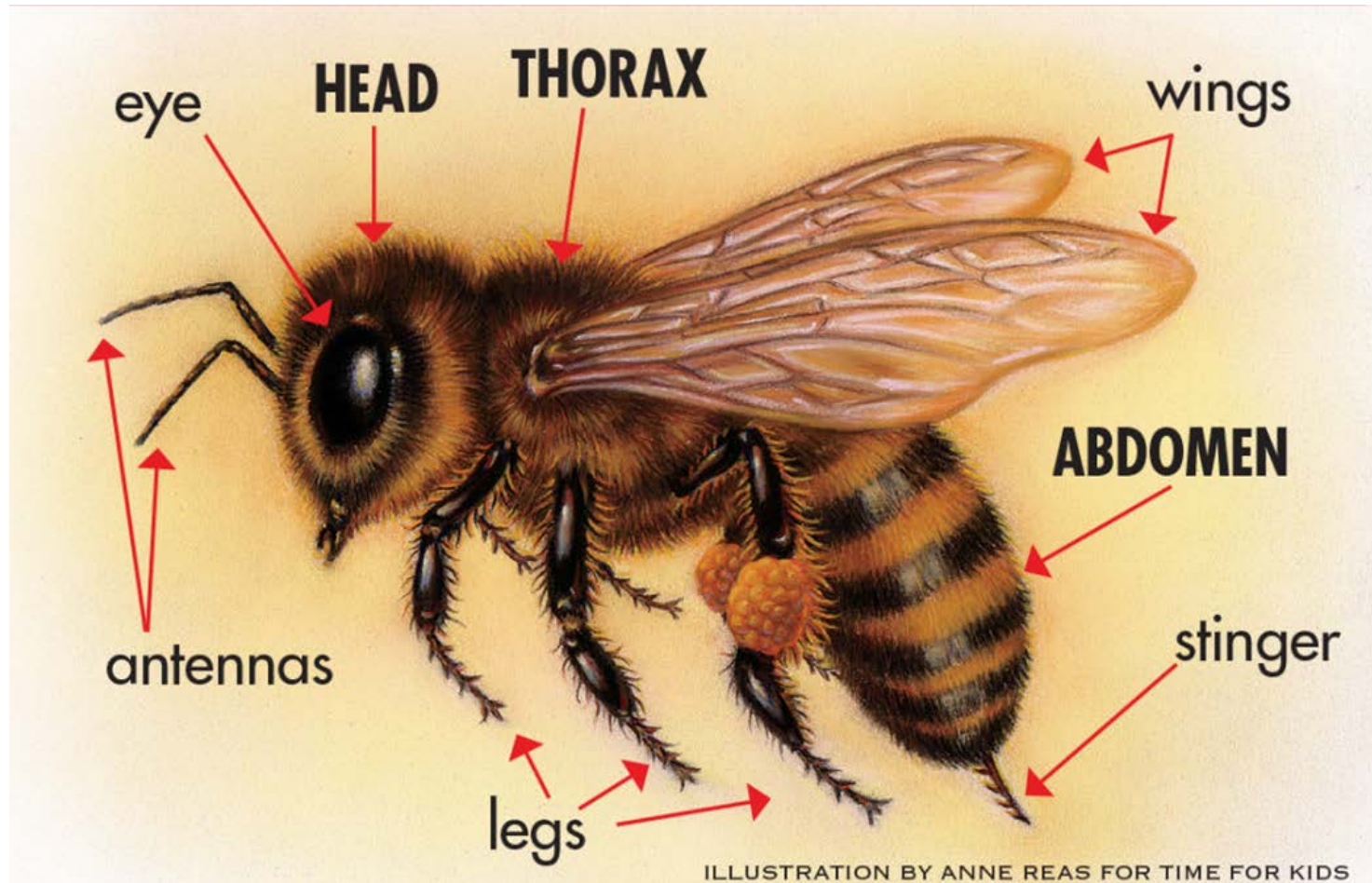


Bees appeared on earth more than 100 million years ago. There are currently more than 20,000 species of bees on the planet. The overwhelming majority of bees are species that live in the wild and play a crucial role in ecosystem function and agricultural production.



- *SOCIAL AND SOLITARY BEES*

Body parts of a bee!



The bees of Cyprus

- Almost 400 bee species!
- One of these is the social bee:
Apis mellifera L.
- The other species are mostly solitary bees.



SOCIAL BEES

Apis mellifera





The House of Social Bees!



Drone

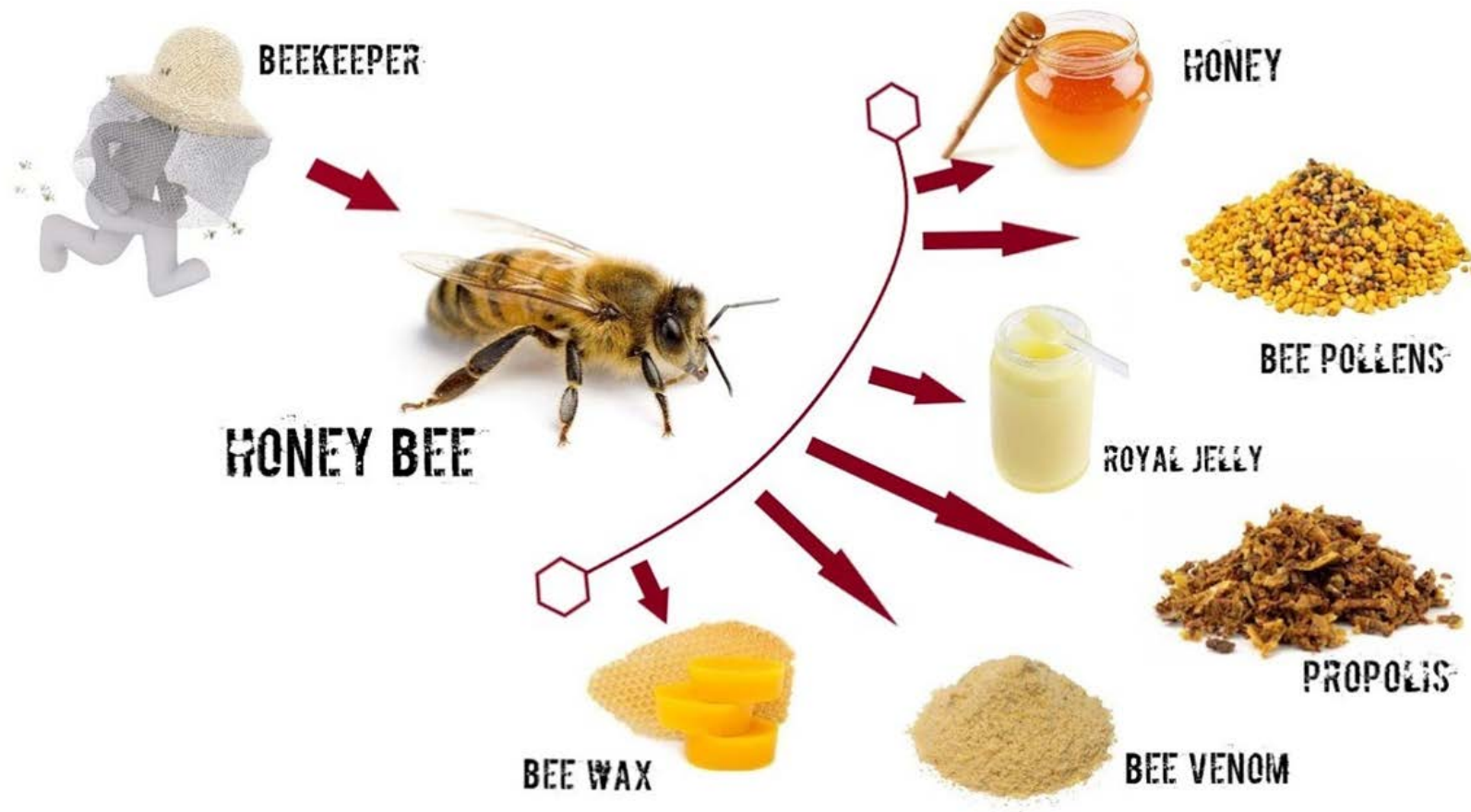


Queen



Worker

The residents of the house!



The products of Social Bees!



Solitary Bees

- They do not produce honey and live a solitary (live on their own) lifestyle. They built their nests, lay eggs inside, store food and then close the nest and leave.
- Solitary bees have a great diversity of shapes, sizes and colors.
- They are very important pollinators!









The Solitary Bee Houses!

What Do Bees Eat?

NECTAR



POLLEN



Why Bees Are So Important!

They pollinate plants producing fruits and vegetables



POLLINATION

How pollination works:

Step 1: Bee visits a flower to collect nectar, pollen sticks to bee



Step 2: Bee flies away with pollen still stuck to its body



Step 3: Bee lands on another flower of the same type, bringing the pollen from the first flower with. This pollinates the second flower and allows for fertilization and reproduction



Photo Credit: Science Over Everything



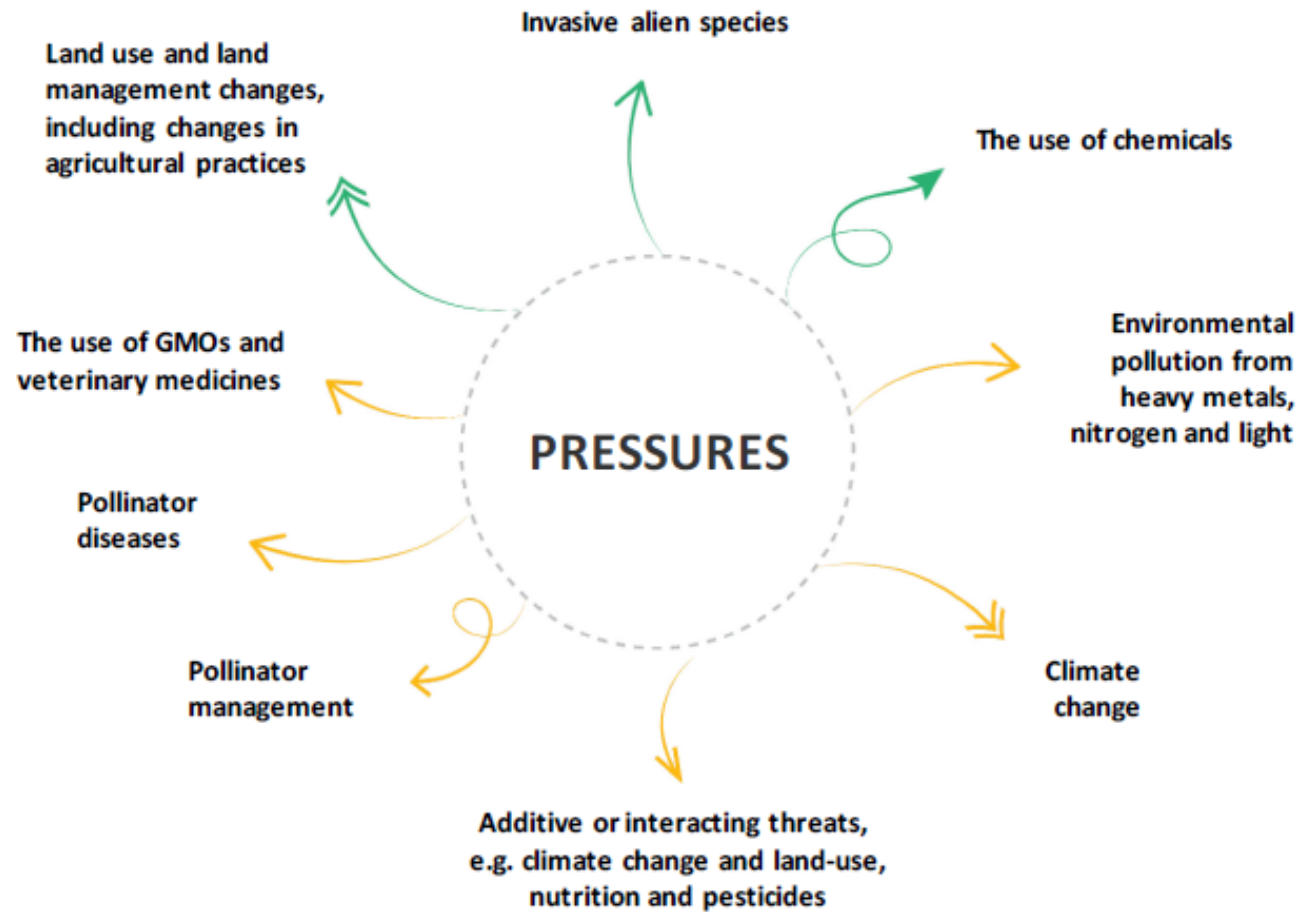
**VITAMIN
BEE**

POLLINATION

"BUSY AS A BEE"

CREATED BY
GEOFFREY KATER

Pressures driving the decline of pollinator populations



Source: ECA based on from IPBES and the Commission.



How you can help bees survive?

Plant pollinator-friendly plants (lavender, thyme, mint, rosemary, roses, etc.)

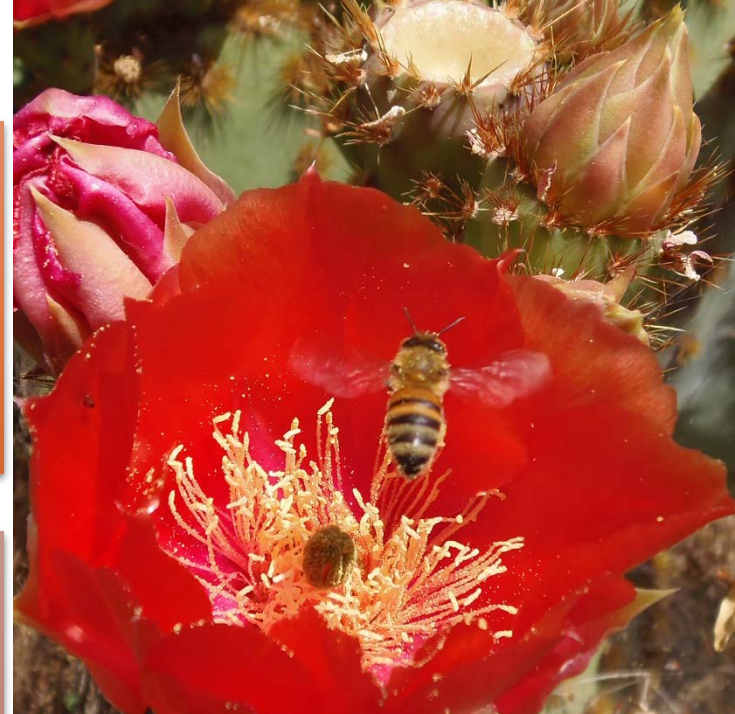
Enrichment of the margins of the fields with flowering plants

Use best practices –
Pollinator-friendly pest control strategies

Leave empty spaces into your garden and fields to provide nesting space

Prevent soil plowing (protect soil nests)

Built bee hotels



Bee Hotels for Solitary bees!



Easy and Funny!

- ❖ Only natural materials. The simpler the better !
- ❖ Reeds
- ❖ Untreated wood
- ❖ Bricks
- ❖ Wood chips
- ❖ Cut stems of dried plants (e.g. *Ferula communis*)
- ❖ Wooden Pallets
- ❖ Drill for the woods (Drill a selection of holes/varying diameters)
- ❖ Wire mesh to protect from predators (optional)
- ❖ Roof to protect from rain
- ❖ Should ideally be placed in a location facing southeast to receive direct sunlight in the morning and 1-2 meters above ground



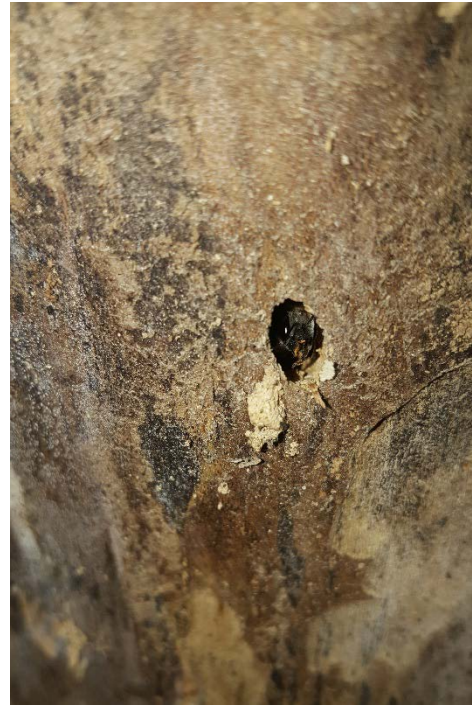
Maintain bee hotels!

- ❖ Cleaning tubes and wood blocks, put new reeds (when the bees finish emerging, you can clean/change the old nest for future use for next year).
- ❖ Preventing parasite attacks.
- ❖ Monitoring of problems (e.g. moisture, wasps, spiders, pollen mites, predatory, birds, ant infestations).
- ❖ Bees need clean and safe nests!





<https://www.makesomethingedmonton.ca/projects/931-build-your-own-bee-hotel/>



You can HELP our bees by
planting bee friendly plants and
built a bee-hotel!



What else can you do to help?



Join the Pollinator Project of Rotary Cyprus

For information on the project and for helpful tips, go to:

<http://rotary-Cyprus.org/projects/the-pollinator-project>

What else can you do to help?

- ▶ How to go about starting a pollinator project on your own?
 - ▶ This can be done on **different scales** to serve various pollinators:
 - ▶ **Small**: your own garden, terrace or balcony
 - ▶ **Medium**: a/your neighborhood school
 - ▶ **Large**: your municipality



What else can you do to help?!

- ▶ Some basic rules:
 - ▶ Choose a **variety of plants** that provide nectar and pollen throughout the growing season.
 - ▶ Use **native plants**, which support the needs of specific native pollinators.
 - ▶ Provide **bare spaces** for ground nesting bees.
 - ▶ Leave **areas of dead wood and leaf litter** for other insects.
 - ▶ Plant in **groups of diverse plants** to increase pollination efficiency.
 - ▶ A **clean, reliable source of water** is essential to provide for drinking and bathing opportunities for pollinators.





Thank you!

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Varnava Andri