Effect of integrated pest management (IPM) on abundance and trophic interactions of arthropod predators inside pear orchards during winter and spring

Domagoj Gajski

Psyllids - *Cacopsylla* spp.

- **Main pest in pear orchards**:
  1)Extract nutrients from pear trees
  2)Induce development of sooty moulds
  3)Transmit harmful phytoplasmas that cause pear decline

- Active already in early spring ➔ high abundance in early summer

- **Resistant to pesticides** due to their polyvoltine nature

Naturaly occuring predators

Specialists –
Anthocoris spp.

Generalist predators

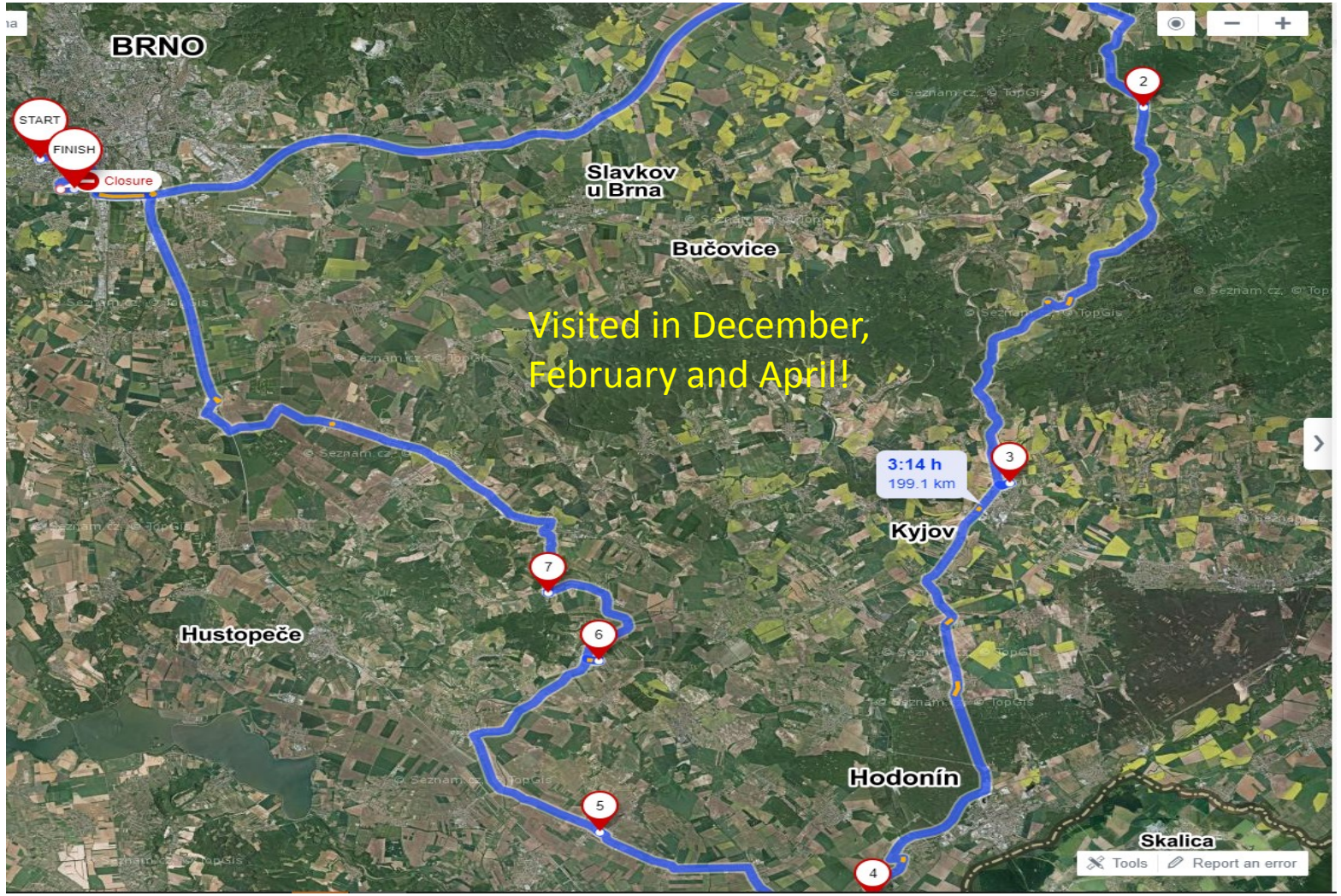
Experimental design

PEAR ORCHARDS:

Netčice	Litenčice
Morkuvky	Velke Bilovice 1
Stary Liskovec	Velke Bilovice 2
Kobyli	Mikulčice

Ecological management - control

Integrated pest management



Experimental design

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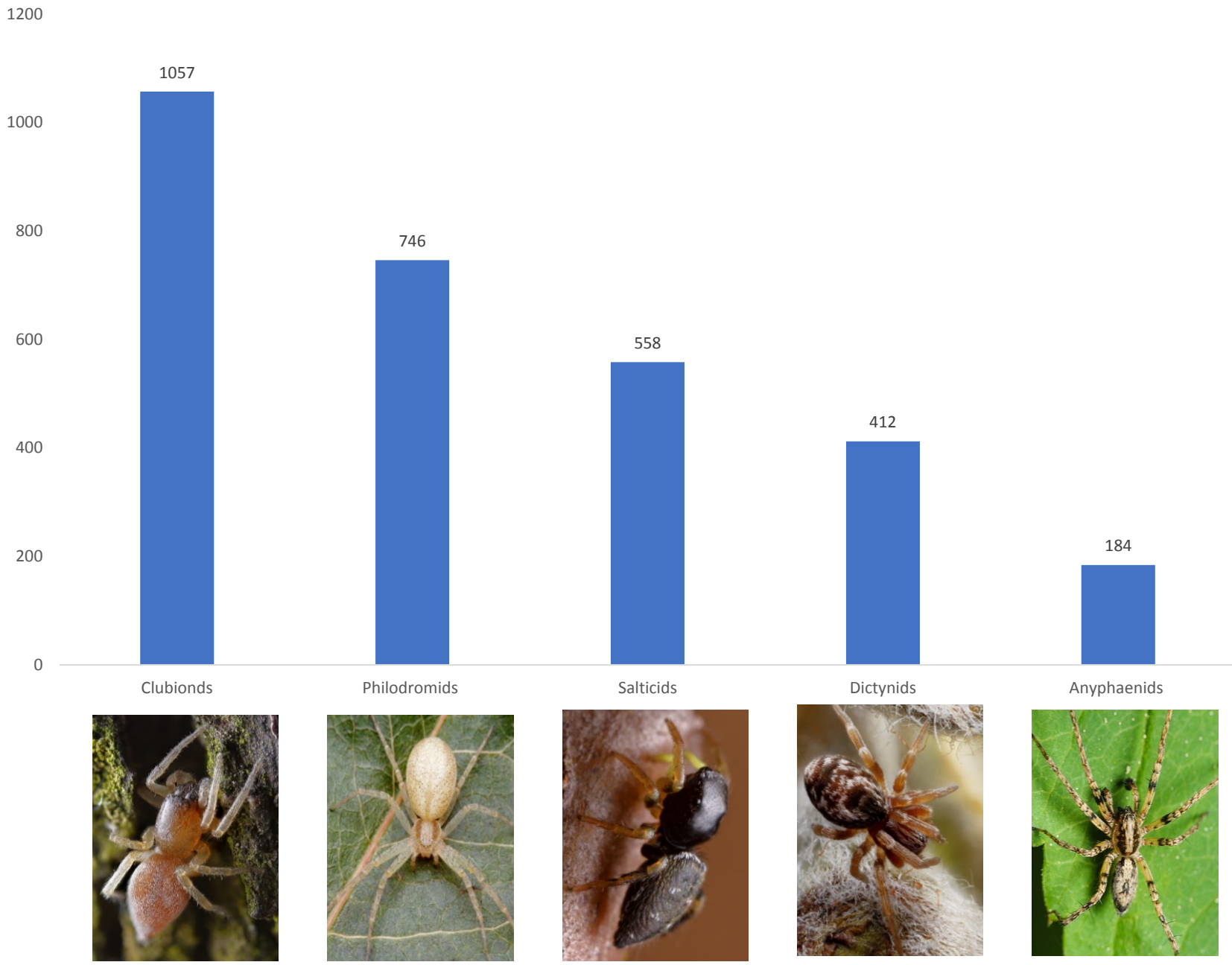
Ecological management - control	Integrated pest management

Installing cardboard traps around trunks and branches

Sorting samples and identification

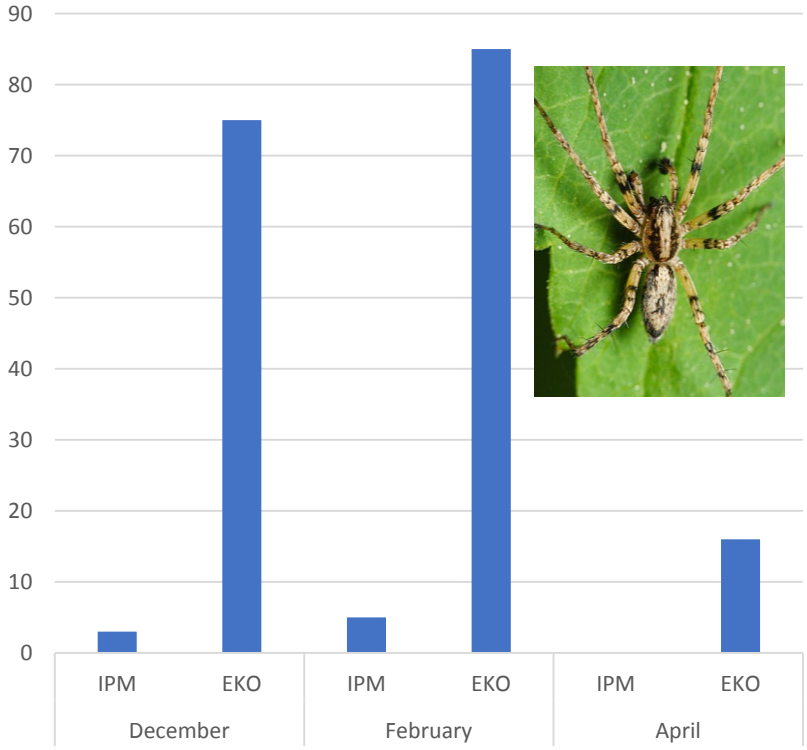
December ➔ February ➔ April

- **Over 10 000 arthropod samples, out of which 4139 were predators.**
- **Out of the predators, more than 80 % were spiders.**

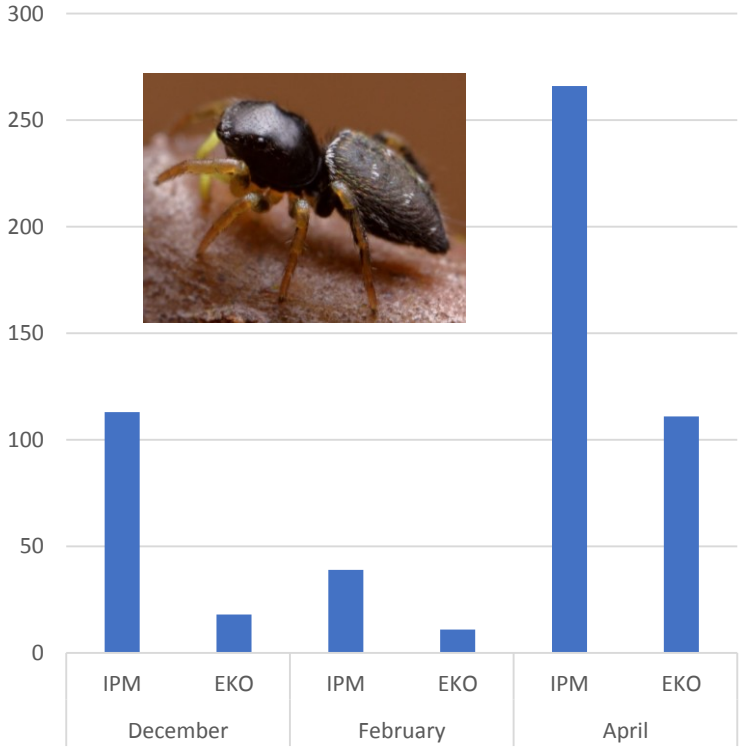


Effect of pest management type on presence of some spider groups

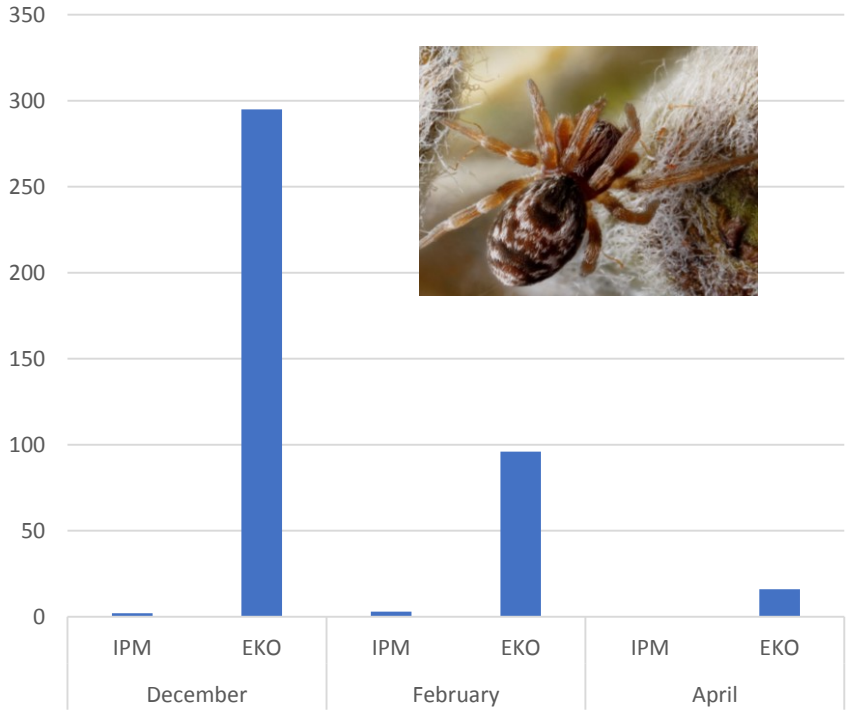
Total number of found anyphaenids



Total number of found salticids



Total number of found dictynids



Aims during this course:

- Compare abundancies of arthropod clades or predatory guilds between:

a) **differently treated orchards** (IPM vs EKO)

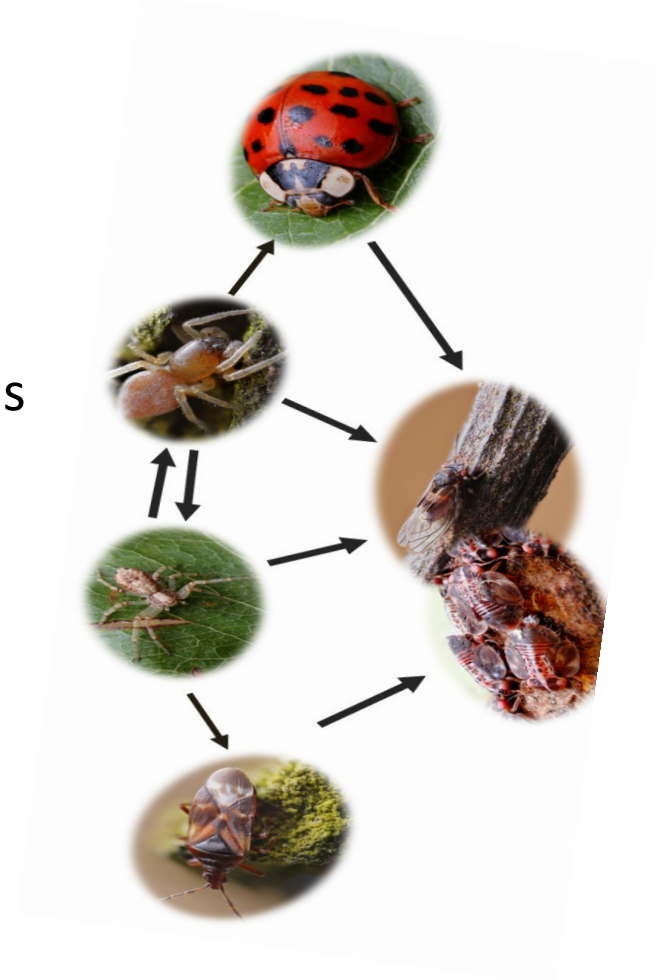
b) samples taken at the **margin** and the **center** of the same orchard

- Compare species richness, diversity and size differences of all arthropods between:

a) **differently treated orchards** (IPM vs EKO)

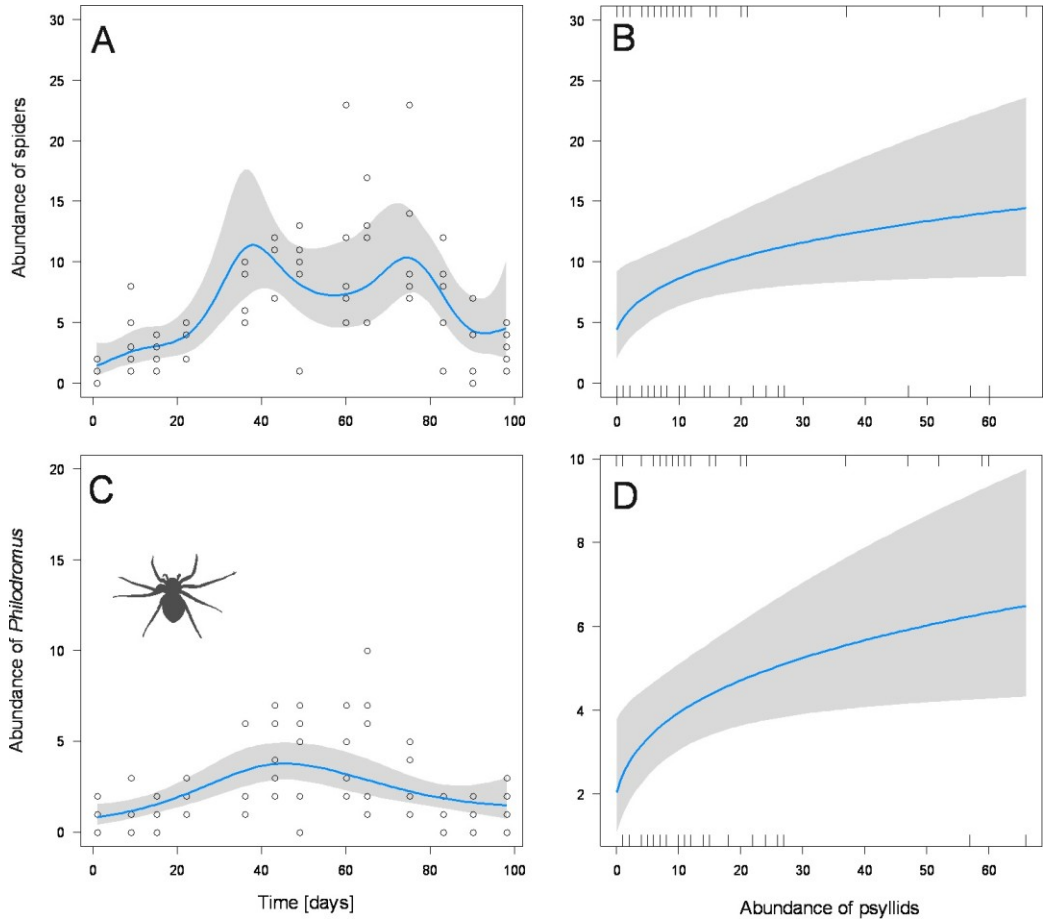
b) samples taken at the **margin** and the **center** of the same orchard

- Assess if there is a **relationship between presence of some specific arthropod groups on the same tree** (e.g. if some predator inhabits a tree due to the presence of some specific prey).



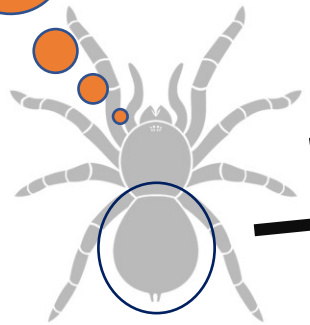
Aims during this course:

- Have data about seasonal abundance changes of predators and psyllids during spring
- Would assess their relationship through regression charts and calculating the significance of their relationship, taking into account the seasonal change and abundance change
- Learn how to make such beautiful charts :)

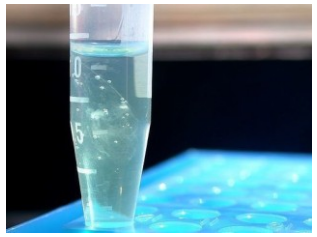


How to study the diet of bugs – molecular methods

You will never guess what I had for lunch!



DNA extraction, PCR



Sequencing

Bioinformatics and Identification of sequences

Ok, ok! You got me! I had a juicy fly!

Transformation of information

Adult male	7716	Lasius sp.
	212	Tetramorium caespitum
	2	Sus scrofa
	2	Felis catus
	2	Homo sapiens

Each prey will be turned into 1 (present) or 0 (not present)

Thank you for your attention!