

Interannual pollinator sharing

by

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Intro

Plants often share pollinators within the plant-pollinator interaction network. However, our knowledge is very limited to a few seasons of observation, while the plant and pollinator populations are falling and rising, with an effect on the pollinator sharing stability. The goal is to investigate how un/stable the interactions and pollinator sharing are, to test if there are stable modules within the network and to what extent the changes in pollinator sharing among plants are driven by changes in plant abundance.

- But what does it mean for pollen transfer?

Methods - the locality

(a) Czech Republic



(a) Rich in flowers



- 15 years of data collection (2011-2025)

Methods - permanent plots

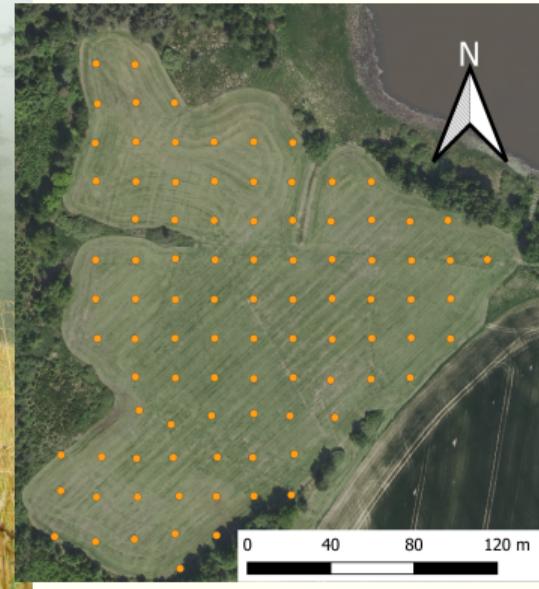
(a) plots are marked



(a) recovered every year



(a) 93 plots in total (+ 10
"edges")



Methods - plant-pollinator survey

(a) Plant survey



(a) Pollinator survey



Methods - plant survey



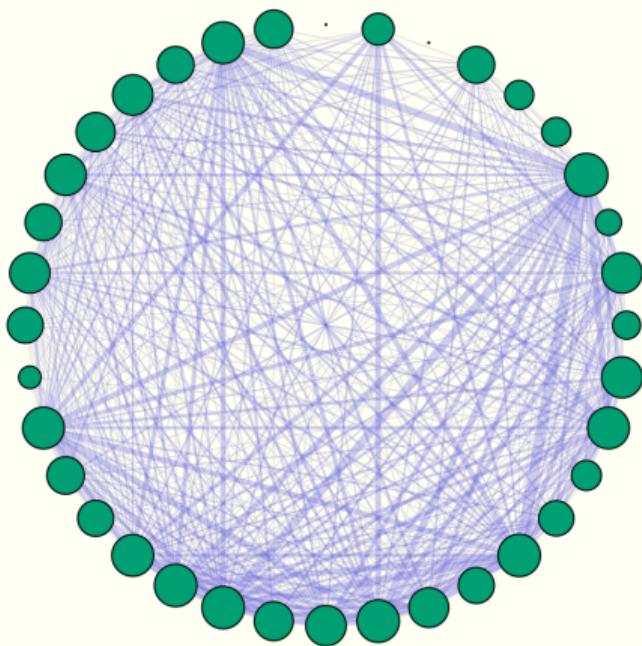
- 4 x 4 meter squares
- divided to 64 0.5 x 0.5 subplots
- Stalks of flowering plants are counted or scored presence/absence in subplots
- 2 times per sampling period
- Data needs to be integrated together - plot or subplot level?

Methods - pollinator survey

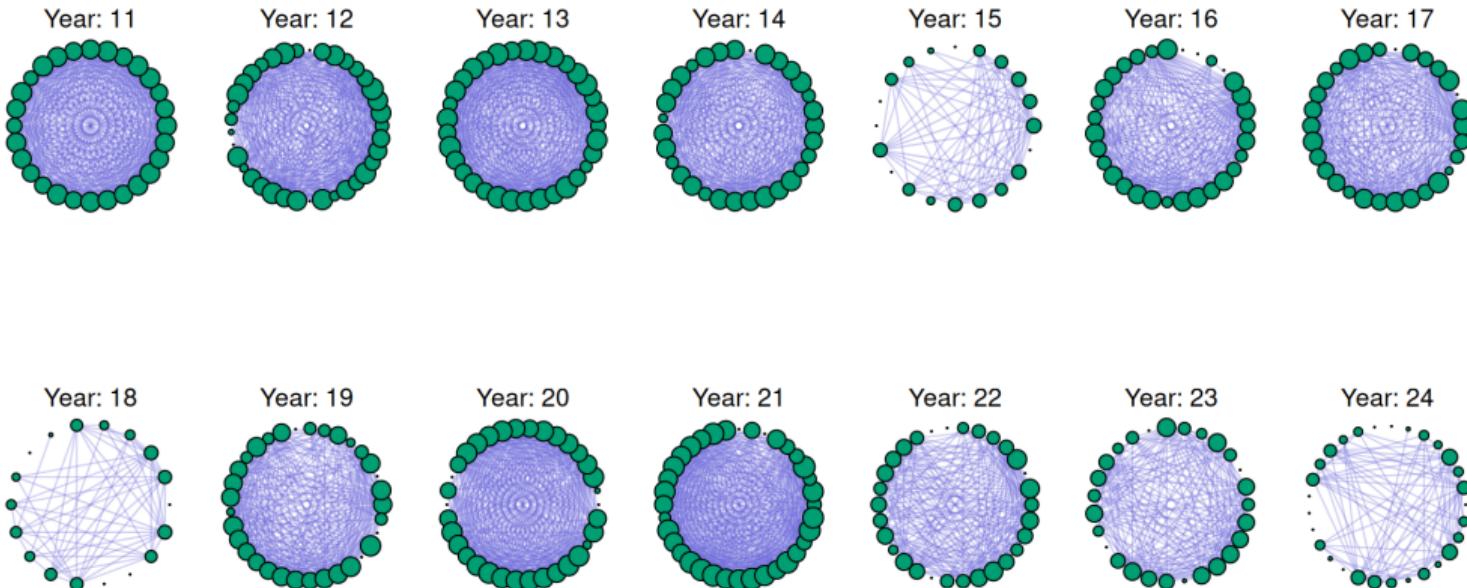


- ▣ “Snapshot” of plant-pollinator interaction
- ▣ = all interactions recorded, every flower unit observed once per sampling
- ▣ 20+ sampling per plot per year
- ▣ Correction for sampling effort
- ▣ 14 000/80 000 entries needs to be checked

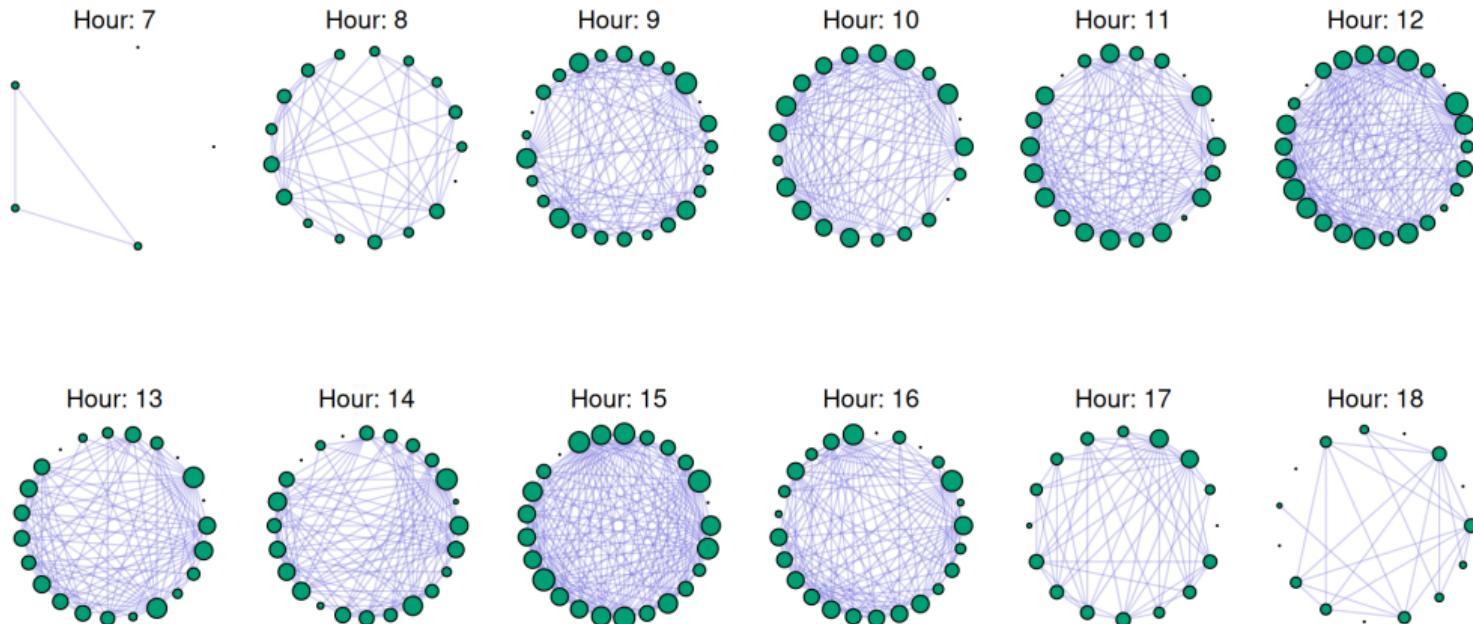
Pollinator sharing among plants



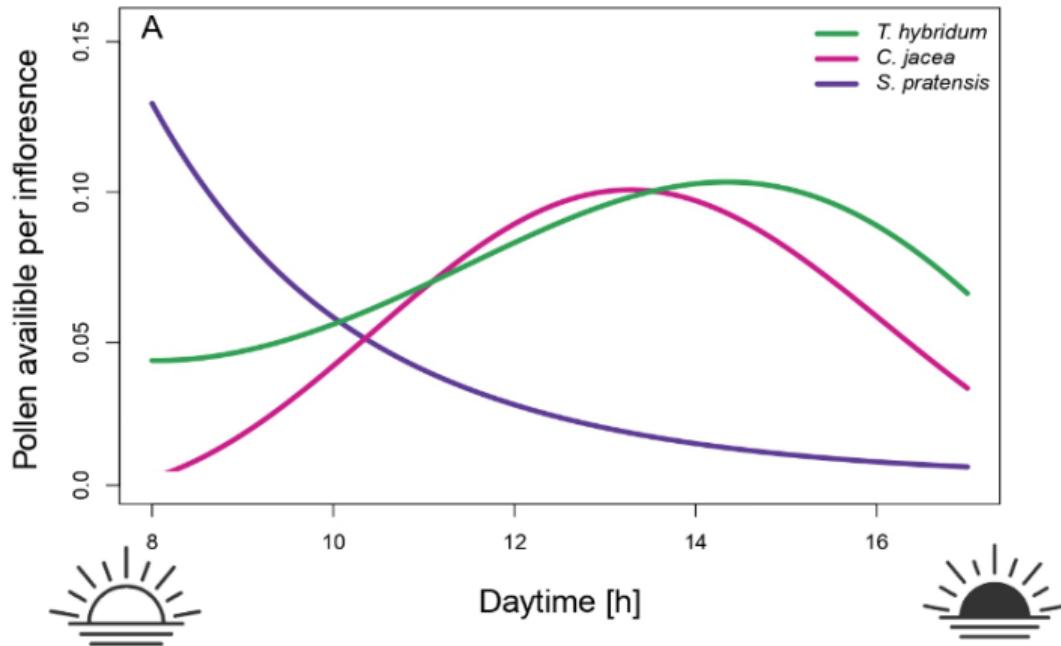
Annual variation in pollinator sharing



Diurnal variation in pollinator sharing

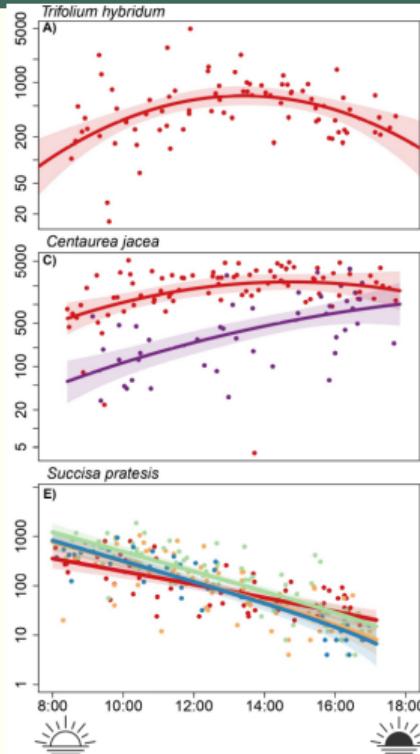


Pollen availability during the day



Štenc, J., et al (2023). American Journal of Botany, e16179

Pollen transfer during the day



Pollen deposition



Pollen deposition



Interannual dynamics - Questions

- ✚ Is pollinator sharing between pairs of plant species stable over years?
- ✚ Which pair of plants are stable and which ones are variable over years?
- ✚ Can we identify stable modules within the network?
- ✚ How much is pollinator sharing driven by changes in plant abundances and how much by other factors (which ones?)

Pollen deposition - questions

- ▢ Does longer exposition of stigma leads to higher deposition than necessary for seed development?
- ▢ Can longevity serve as mechanism to allow accumulation of pollen?
- ▢ Does longer exposition leads to higher proportion of HP?

Progress?

So far not so much

The plan

- 💡  - to clean the data and prepare the data sets for analysis (in progress)
- 💡  - make a package for repeated analyses
- 💡  - analyse the stability of pollinator sharing
- 💡  - write down the MS - draft around Christmass

Data cleaning



- Plant abundances - now facing the cleaning and decision-making
- Plant-pollinator interactions - 29th of September another meeting (11% to be solved)
- Support data - coordinates, climatic data, traits data

HanPolNet package



- One package to rule all the data - including support data
- Fully available at Github The GitHub logo, which is a white octocat icon inside a blue circle.
- First step: the structure
- I started yesterday

Analysis



Analysis



- Interested in seeing stability of
 - ▶ plant species abundance
 - ▶ plant distribution patterns
 - ▶ plant-pollinator interactions
 - ▶ pollinator sharing between plant species

SCAPE 2025

- data for pollinator sharing of one plant species
- Data for pollen transfer to that one species from others
- Developing the idea on it
- Using it to test my package functionality

