Pollen transfer efficiency

as a function of pollen deposition and pollen removal

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INTRODUCTION

Pollen grains have a long way to fulfill their goal. Firstly pollen is beying **presented**, then it is **removed** and **carried** by a pollinator. In the end to be **lost/eaten** or **deposited**. But how many pollen grains are present in these steps and how many succeed?

AIMS

How many pollen grains are present in every step of the pollination **(partly to do)**
How many pollen grains are lost inbetween these steps **(to do)**
How are these pollen count influenced by time and pollinators **(partly to do)**

COLLECTED DATA

Pollen presented

Pollen removed

Carried and eaten pollen

Pollen deposited per visit

Total pollen deposited

POLLINATORS

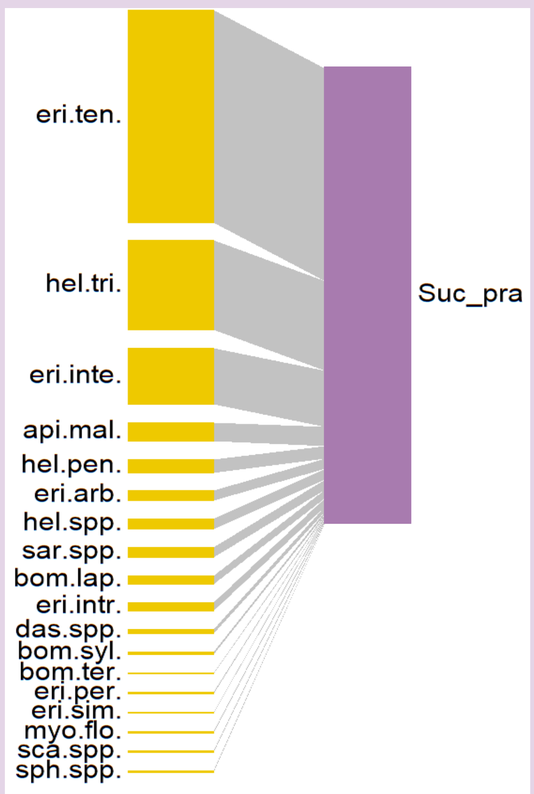

Fig. 1: Visitation spectrum of Succisa pratensis. Sampled from visits both for pollen removal and pollen deposition. Overall 18 species visited Succisa, but only top 3 species were sufficiently numerous for analysis.

POLLEN REMOVAL

Pollen removal	Median	Mean
Pollen presented	**230**	**305**
Pollen remaining after visit	**180**	**242**

Table 1: Pollinators remove about a fifth of all avaiable pollen per visit. Sorry, still working on more interesting things about removal, but not ready yet ☹

READ THIS WAY

CONCLUSION

- **Pollinators** remove about 1/5 of presented pollen, which is not that much
- **They** also deposit a small amount of pollen and a lot of visits does not bring pollen at all
- **Therefore** succisa needs many visits to be saturated
- **Success** rate of deposition depends on the time of the day, quantity depends on pollinator species

POLLEN DEPOSITION

Was pollen deposited during a visit?

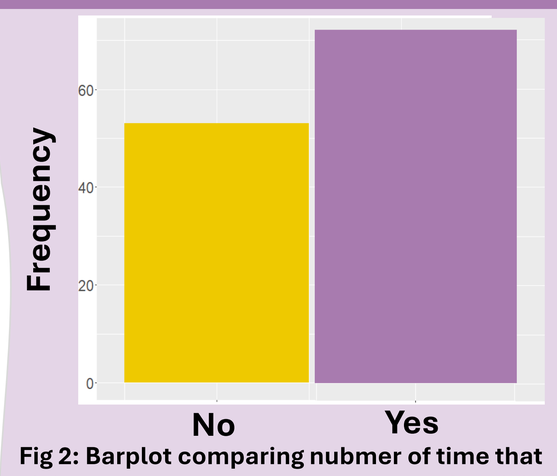

Fig 2: Barplot comparing nubmer of time that visit brought zero pollen/any pollen. Suprisingly only 57% of visits ended up in pollen deposition.

That‘s why Succisa needs many visits to obtein pollen

Single visit on floret	All visits per floret	Inflorescence with 100 florets
3.355 pollen grains deposited	**20.54** pollen grains deposited	**2054** pollen grains deposited

Effect of pollinator species on deposition quantity

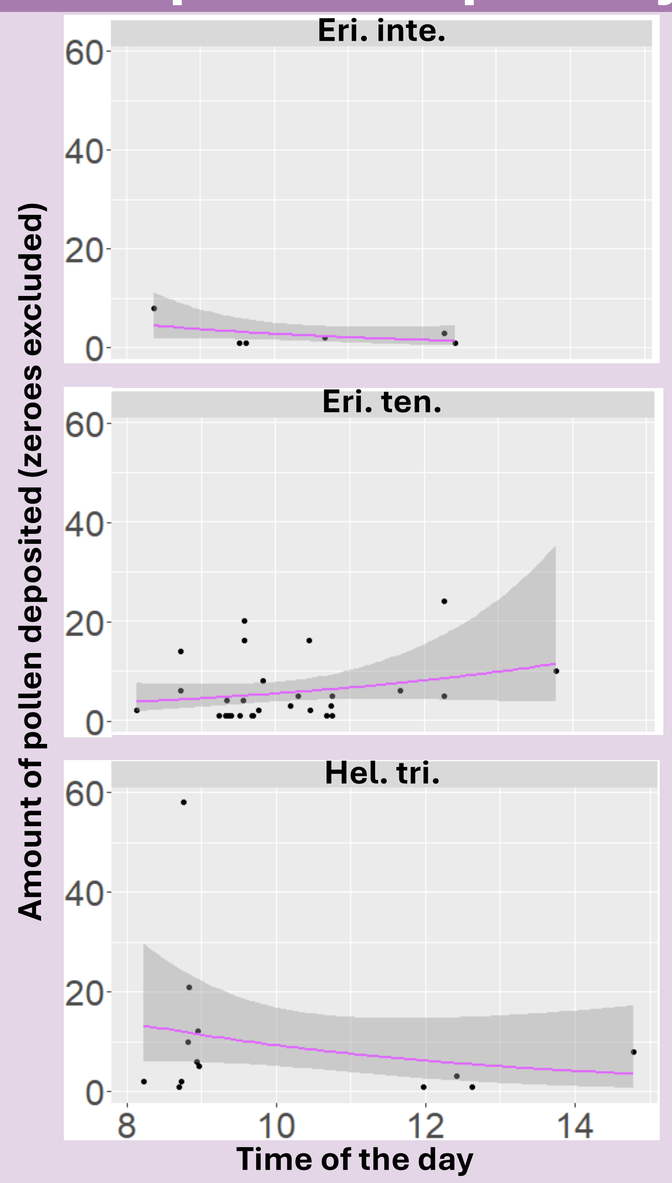

Fig 4: Vizualization of hurdle model count part (truanced poisson with log link). P value for pollinator species at least p < 0.01 (z = 2.77 – 4.6). Time was not significant (p = 0.055). This tells us, that the quantitative part of the process depends on the pollinator species. But remember, the succes rate depends on time (Fig 3).

Effect of time on the frequency of non-zero deposition

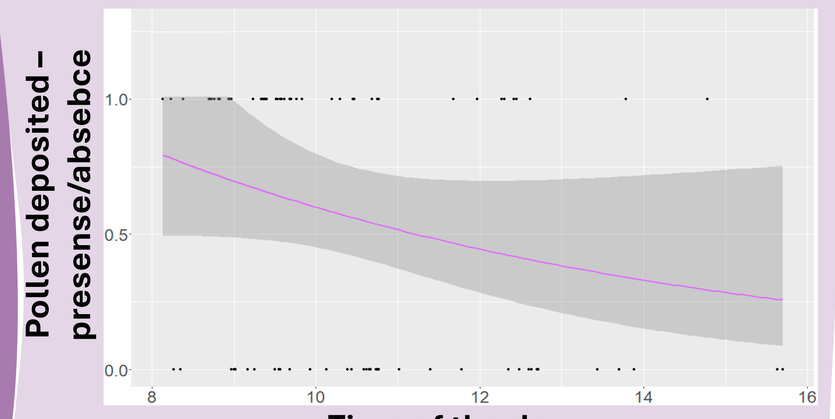

Fig 3: Vizualization of hurdle model zero part (binomial with logit link). P value for Time = 0.02 (z = -2.26). Pollinators were not significant. This tells us, that the probability of deposition not beying zero depends mainly on time, and not the pollinator species.