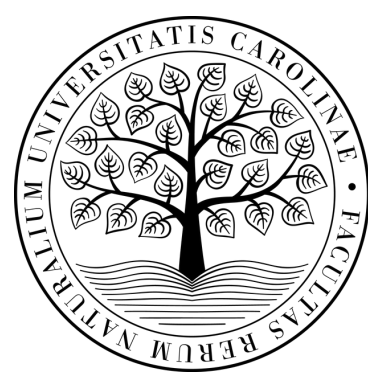


Tracking patterns of pollen transfer under different plant spatial structures



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Introduction

Plants grow often aggregated in clusters and pollinator behaviour reflects this pattern. Thus, pollen transfer can be expected to largely depend on plant spatial aggregation. This has important implications for plant mating, since individuals in clusters are often closely related. Aim of this study was to investigate the importance of changing within- and among-cluster distances for pollen transfer between these clusters simulated using fluorescent dye as pollen analogue.

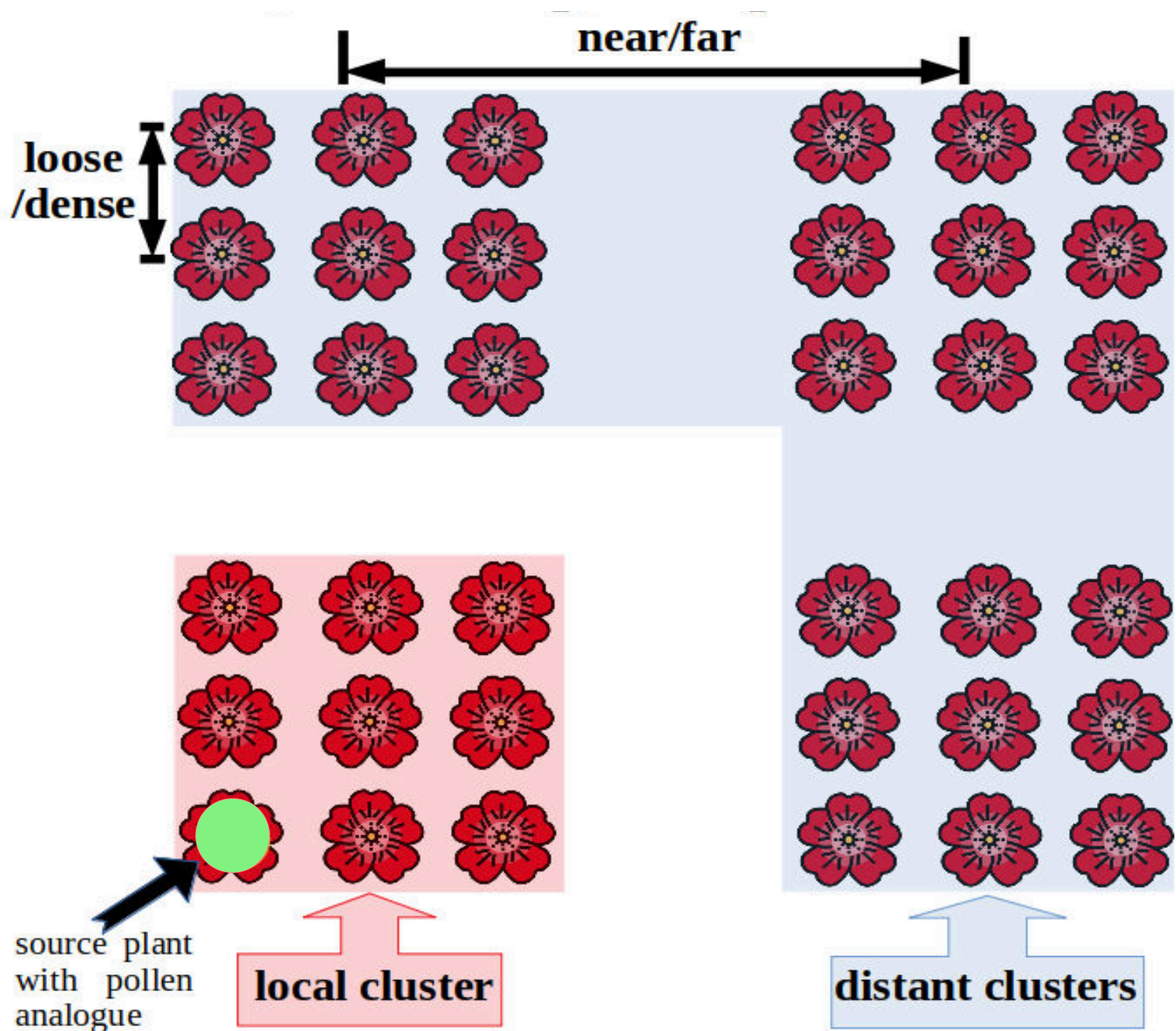
Questions

- A) How does the pattern of pollen transfer change with varying degree of plant aggregation?
- B) How does plant aggregation influence the probability of pollen transfer from the source to the same (=local) cluster or to other clusters (=distant)?

Experimental design



- Potted individuals of Carthusian Pink (*Dianthus carthusianorum*) transferred to meadow with wild population.
- Pollinated mainly by butterflies (65% of all visits) out of which *Pieris brassicae* (36%) and hoverflies (22% of all visits).



- Fluorescent dye was applied on a plant in a random corner of each array.
- 4 spatial arrays of potted plants differing in within- (dense/loose) and among-cluster (close/far) distances.

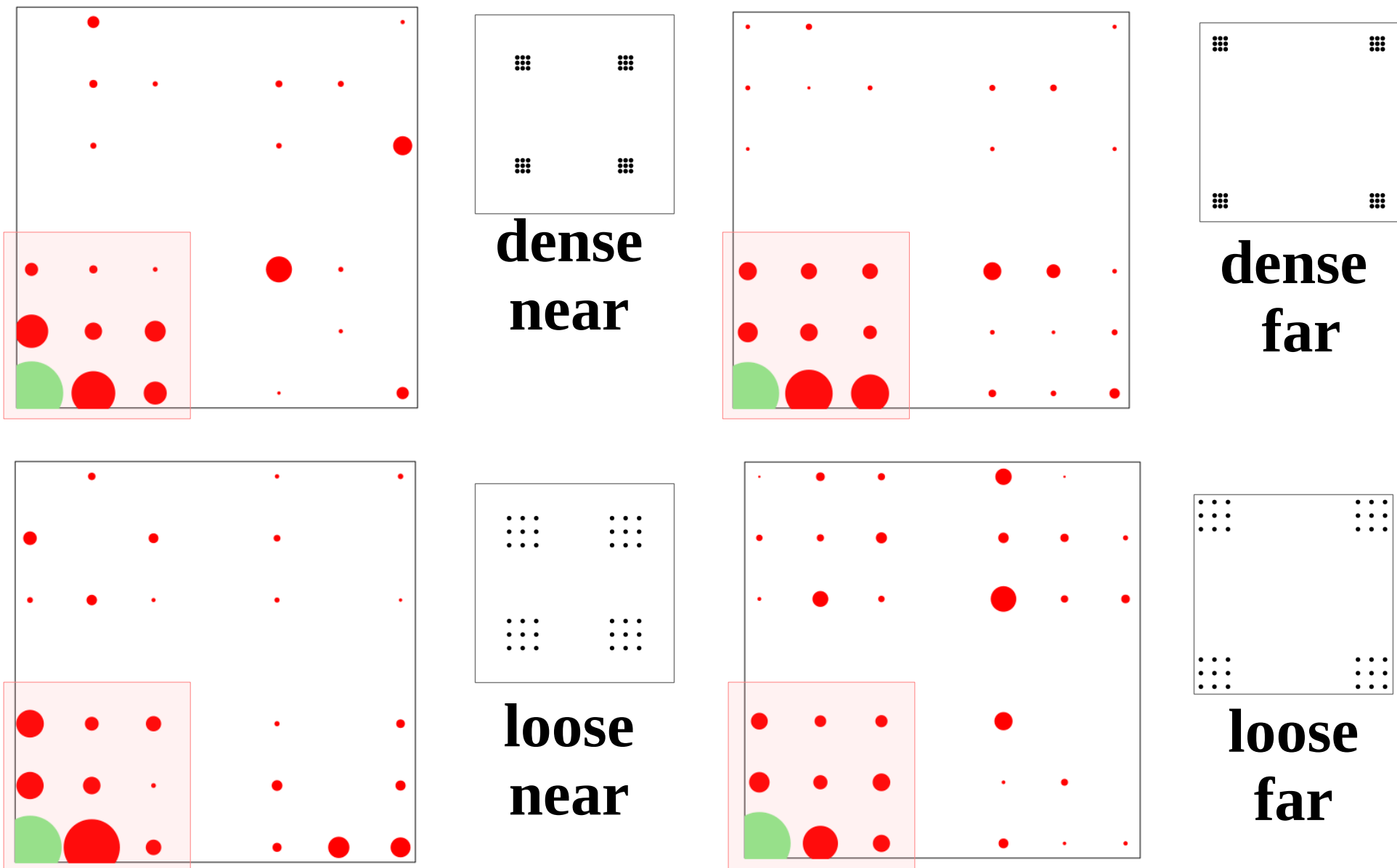
Statistical analysis

- Linear mixed-effect model of proportion of UV-fluorescent dye grains on flowers

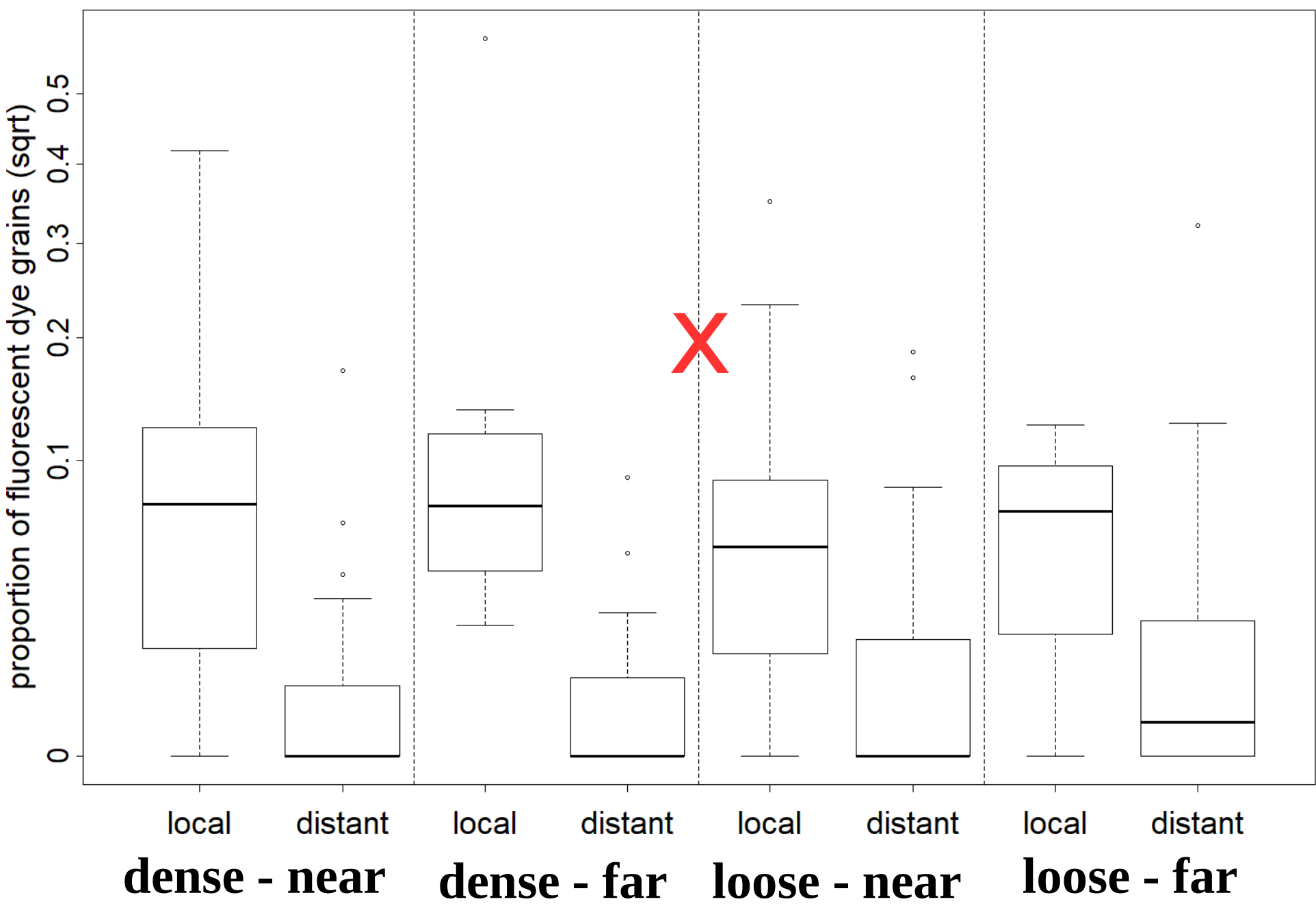
Predictor	D.f. num.	D.f. den.	Sum of Sq.	p-value
patch (local/distant)	1	268	1.860	<0.001
within-cluster distance	1	6.47	0.006	n.s.
between-cluster distance	1	6.47	0.003	n.s.
within × between	1	6.47	<0.001	n.s.
patch × within-cluster dist.	1	268	0.101	0.003
patch × between	1	268	0.001	n.s.
patch × within × between	1	268	0.004	n.s.

Results

Observed distribution of UV-dye pollen analogue after one day (average of 2 replicates)



Density of UV-dye grains in local and distant clusters under different aggregation treatments



Conclusions

- Only within-cluster distances affected pattern of dispersal of UV-dye pollen analogue.
- Dense clusters decrease the probability of pollen transfer outside the local cluster.
- Observed pollinator behaviour may have serious consequences for mating pattern of clonal plants (large proportion of perennial herbs).

Future research

In following experiments, we plan to investigate the patterns of pollen transfer with several plant species hosting different dominant pollinator functional groups in order to compare the spatial patterns of pollen transfer generated by different pollinator functional groups.

Acknowledgement

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