

GENERAL INFORMATION

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ABSTRACT

Since most pollen travels limited distances in wind-pollinated plants, both the local quantity and diversity of mates may limit female reproductive success. Yet little evidence exists on their relative contribution, despite the importance of viable seed production to population dynamics. To study how variation in female reproductive success is affected by the quantity versus the diversity of surrounding mates contributing pollen, we integrated pollination experiments, data on natural seed set and seed viability, and AFLP genetic marker data in the wind-pollinated dioecious clonal forest herb *Mercurialis perennis*.

Pollination experiments indicated weak quantitative pollen limitation effects on seed set. Among-population crosses showed reduced seed viability, suggesting outbreeding depression due to genetic divergence. Pollination with pollen from a single source did not negatively affect reproductive success. These findings were consistent with results of the survey of natural female reproductive success. Seed set decreased with the distance to males in a female plants' local neighborhood, suggesting a shortage of pollen in isolated female plants, and increased with the degree of local genetic diversity. Spatial isolation to other populations and population size did not affect seed set. None of these variables were related to seed viability.

We conclude that pollen movement in *M. perennis* is likely very limited. Both male proximity and the local degree of genetic diversity influenced female reproductive success.

MATERIALS & METHODS

study area	3e (small population)
time period	2006-2007
goal	How is female reproductive success in <i>M. perennis</i> affected by the quantity versus the diversity of surrounding mates contributing pollen.
set-up	pollination experiment in 9 populations between Ghent and Oudenaarde <ul style="list-style-type: none">- 45 female shoots per population- 3 treatments (15 shoots per treatment): pollinated with pollen from a nearby male, from a male of a large population from another forest, open-pollinated- germination test with the resulting seeds determination natural reproductive success for 16 populations between Ghent and

	<p>Oudenaarde</p> <ul style="list-style-type: none"> - 5 m x 5 m plot in each population - leaves from 18 shoots - 30 females tagged (March 2007) + fruits collected (May 2007) <p>experimental array on the effect of male proximity (population 4)</p> <ul style="list-style-type: none"> - 30 females transplanted at 2, 4, and 8 m from the population (10 per distance)
data collection	<p>pollination experiment: seed set and seed viability</p> <p>natural reproductive success:</p> <ul style="list-style-type: none"> - per population: spatial isolation, population size - per plot: AFLP genetic diversity, male proximity, reproductive success - per female: no of flowers, distance to the two nearest males, male density, no of seeds, no of viable seeds <p>male proximity: no of seeds</p>
remarks	<p>1 population from the Aelmoeseneie forest (3b nor 3e seem to be ancient forest according to De Keersmaeker et al 2001)</p>

RESULTS

- Seed set was higher on females pollinated with pollen from the same population than on open-pollinated females. Seed viability was lowest for the females pollinated with pollen from another population.
- Female plants closer to males set more seeds than females farther away. Seed set also increased with the degree of genetic diversity among local genotypes. Seed viability was not significantly affected by any of the studied variables. The number of viable seeds per plant was generally low and strongly correlated with the number of seeds produced.