



## [Genetic and sexual separation between insect resistant and susceptible \*Barbarea vulgaris\* plants in Denmark.](#)

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Abstract: Co-evolution between herbivores and plants is believed to be one of the processes creating Earth's biodiversity. However, it is difficult to disentangle to what extent diversification is really driven by herbivores or by other historical-geographical processes like allopatric isolation. In the cruciferous plant *Barbarea vulgaris*, some Danish individuals are resistant to herbivory by flea beetles (*Phyllotreta nemorum*), whereas others are not. The flea beetles are, in parallel, either resistant or susceptible to the plants defenses. To understand the historical-evolutionary framework of these interactions, we tested how genetically divergent resistant and susceptible plants are, using microsatellite markers. To test whether they are reproductively fully compatible, resistant and susceptible plants were grown intermixed in an outdoor experiment, and the paternity of open-pollinated offspring was determined by analysis of molecular markers. Resistant and susceptible Danish plants were genetically strongly differentiated and produced significantly fewer hybrids than expected from random mating or nearest neighbour mating. Our results suggest that the two types belong to different evolutionary lineages that have been (partly) isolated at some time, during which genetic and reproductive divergence evolved. A parsimonious scenario could be that the two plant types were isolated in different refugia during the previous ice age, from which they migrated into and met in Denmark and possibly neighbouring regions. If so, resistance and susceptibility has for unknown reasons become associated with the different evolutionary lineages.

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