Reduced sexual compatibility between cultivated and wild chicory and their F1 hybrids

Crops were domesticated from wild plants not too long ago and have subsequently diverged from the wild ones, especially in traits used by humans. Whether divergence between the cultigen and wild forms has also lead to reduced reproductive compatibility is unknown for many species. Chicory (Cichorium intybus L.) has been bred as a crop at least since Roman times. To test if this has led to a loss in reproductive compatibility with wild chicory, we planted cultivar, wild, and F1 hybrid plants into two field plots, and let them pollinate freely. On 2 days, in the beginning and middle of the flowering season, we counted the numbers of flowering capitula and open flowers per capitulum, which in combination with counts of viable pollen per flower were used to estimate the expected proportion of seeds fathered by cultivar, wild, and hybrid plants. Open capitula on wild and hybrid plants were marked, and when seeds were ripe we determined whether cultivar, wild or hybrid plants had pollinated the seeds, using AFLP markers. Cultivar plants fathered much fewer seeds than expected, both on wild and hybrid plants, suggesting that some degree of incompatibility has evolved between cultivar and wild chicory. Hybrid plants fathered more seeds than expected on some of the hybrid plants, indicating that hybrids do not suffer much from outbreeding depression. Our study thus suggests that cultivated and wild chicory, even though they belong to the same species, have diverged to an extent where reproduction between them is somewhat impaired.

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