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## Pre-dispersal seed mortality in *Centaurea cyanus*

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Seed production is reduced by various kinds of pests, including those hosted by the fruit that impact seed ripening and viability indirectly, and those directly attacking the seeds before they are released. This results in pre-dispersal seed mortality, which may have strong effects on plant population dynamics. However, compensative evolution (or co-evolution) could select for fruits with adapted morphology. We wonder if pre-dispersal mortality could limit the population growth rate and contribute to the decline of *Centaurea cyanus* L. (also *Cyanus segetum*, Hill). The present study focused on the occurrence and abundance of seed-feeding insects of cornflower flower heads, and their relationships to capitula size, seed viability and germination.

Larger capitula had lower proportion of healthy seeds. Although no visible damage was observed to the seeds of *C. cyanus*, the presence of cecidomye larvae inside the capitula correlated with seed loss. It seems that gall midges could have a significant impact on ovule fertilization, seed abortion and viability of fully developed seeds of cornflower. A higher rate of aborted seeds in presence of gall midge larvae could have resulted from fewer visits by pollinators, which may have been repelled, or from the deprivation of resources (by the larvae). The viability of the apparently healthy seeds is lower when the capitulum contains aborted seed and/or larvae. In conclusion, pre-dispersal mortality could select against the evolution of the species toward larger capitula, and have detrimental consequences on seed number, viability and germination, which limit the spread of *C. cyanus* populations.