



# Germination and afterripening in the annuals *Conyza bonariensis* and *Conyza canadensis* (Asteraceae)

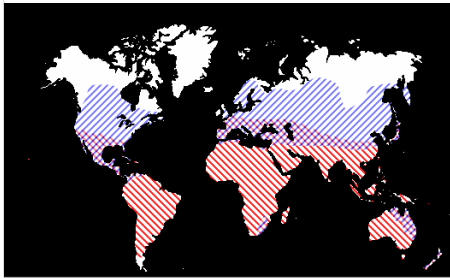
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## Introduction

Afterripening exists in seeds of various Asteraceae species. In this study, germination preferences and afterripening were used to compare two widespread, weedy *Conyza* species.



*Conyza canadensis*  
 *Conyza bonariensis*

## Method

Achenes of *C. bonariensis* were collected in Ethiopia, Mexico and Morocco, and *C. canadensis* were collected at three sites in Sweden. Achenes were stored at 15/5 °C (day/night). Germination was tested several times until 52 weeks of dry storage, each time at four temperature regimes; 15/5, 20/10, 25/15 and 30/20 °C. The data were

subjected to an ANOVA, and were also fitted to a logistic function:

$$f(x) = \frac{e^{a+bx} \cdot c}{1 + e^{a+bx}} + d, \quad 0 \leq f(x) \leq 100$$

|              |                               |
|--------------|-------------------------------|
| $f(x)$       | Germination (%)               |
| $x$          | Afterripening time (weeks)    |
| $e$          | Base of the natural logarithm |
| $a, b, c, d$ | Constants                     |

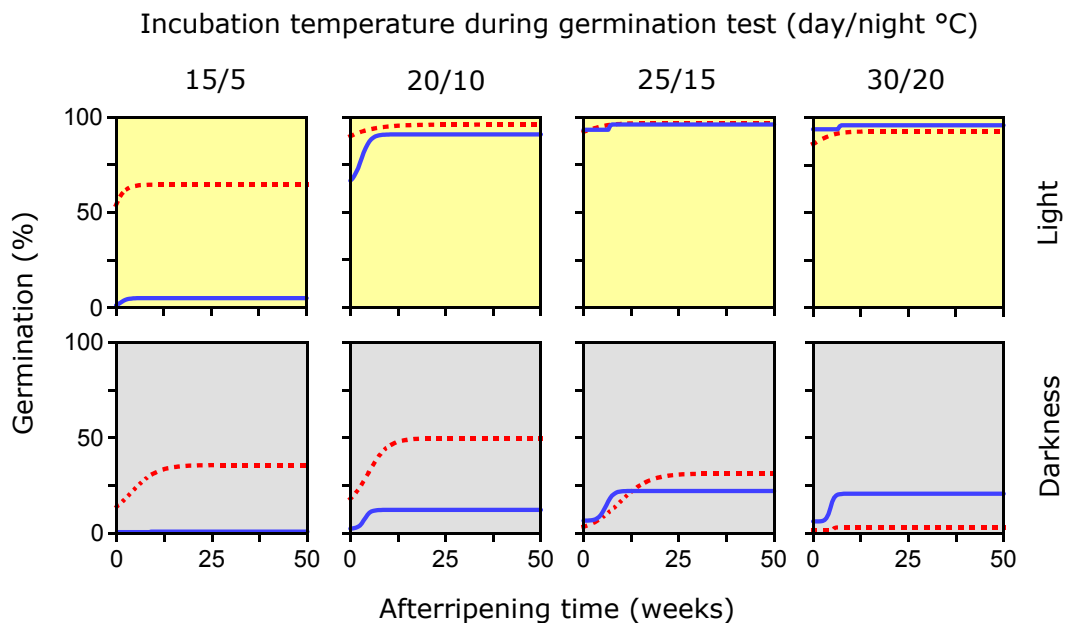
## Results

- There was a significant difference between species, but not between seed batches within each species (nested ANOVA).
- Initial dormancy level was low.
- Germination in light was high.
- Afterripening occurred in both species, resulting in germination in darkness.
- Germination in darkness varied substantially between test occasions.
- Germination at low temperature occurred only in *C. bonariensis*.

## Figure explanations

Germination during afterripening of dry-stored seeds of *Conyza bonariensis* and *Conyza canadensis*, based on three seed batches per species. Seeds were incubated at various temperatures combined with either light 12 h day<sup>-1</sup> or continuous darkness.

*Conyza canadensis*  
 *Conyza bonariensis*



## Discussion

The two *Conyza* species differed in their germination preferences; only *C. bonariensis* germinated at low temperature. Both species had a low initially dormancy level.

There was an afterripening effect in both species, even though the effect was most pronounced in *C. bonariensis*. Afterripening was manifested by an increased germination in darkness. *Conyza bonariensis* did not germinate in darkness at warm temperatures, but to a high degree in intermediate and low temperatures. *Conyza canadensis* did germinate to some degree in darkness at warm and intermediate temperatures, but not at low temperatures.

The detected difference in species' responses to temperature suggests differences in timing of emergence in cold temperate areas. There, *C. canadensis* achenes might postpone germination during autumn and produce seedlings the following spring. In contrast, *C. bonariensis* would germinate directly after dispersal, even late in autumn.

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