## New Phytologist Supporting Information Instructions:

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## *New Phytologist* Supporting Information

Article title: Phenological germination shifts of alpine plants in contrasting microclimates

Authors: Espinosa del Alba, C., Fernández-Pascual, E. & Jiménez-Alfaro, B.

Article acceptance date: Click here to enter a date.

The following Supporting Information is available for this article:

**Table S1 Dataset of raw germination data** [Note: if your file is a large table, e.g. an Excel file, this should be submitted separately]

**Table S2 Detailed incubator programs** [Note: if your file is a large table, e.g. an Excel file, this should be submitted separately]

**Fig. S1** Germination traits correlation plots

Interfaz de usuario gráfica, Aplicación

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**Table S3 Complete species germination traits** [Note: if your file is a large table, e.g. an Excel file, this should be submitted separately]

**Fig. S2** Field and laboratory germination comparison

**Fig. S3** Individual species germination curves per sampling site and incubator

Diagrama, Dibujo de ingeniería

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**Table S4 PCA traits contributions to axis** [Note: if your file is a large table, e.g. an Excel file, this should be submitted separately]

**Table S5 Phylogenetic signals and random factors significances** [Note: if your file is a large table, e.g. an Excel file, this should be submitted separately]

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Lambda values | Mediterranean | | | Temperate | | |
| Trait | post.mean | L\_95% CI | U\_95% CI | post.mean | L\_95% CI | U\_95% CI |
| Autumn germination | 0.97 | 0.94 | 0.99 | 0.97 | 0.94 | 1 |
| Winter germination | 0.93 | 0.86 | 0.98 | 0.96 | 0.91 | 0.99 |
| Spring germination | 0.91 | 0.81 | 0.98 | 0.93 | 0.8 | 0.99 |
| Summer germination | 0.88 | 0.74 | 0.99 | 0.85 | 0.71 | 0.96 |
| Total germination | 0.95 | 0.91 | 0.99 | 0.95 | 0.92 | 0.98 |
| t50 | 0.73 | 0.39 | 0.95 | 0.59 | 0.34 | 0.83 |
| Environmental heat sum | 0.47 | 0 | 0.78 | 0.4 | 0 | 0.74 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| animal = filogenia |  | Random = ~ animal + code:ID | | | | | |
| ID = especies |  | Mediterranean | | | Temperate | | |
| code:ID = poblacion dentro especie |  | post.mean | l-95% CI | u-95% CI | post.mean | l-95% CI | u-95% CI |
| Autumn germination | phylogeny | 40.78 | 10.45 | 84.88 | 46.73 | 8.51 | 109.03 |
| population:species | 3.25 | 0.91 | 6.62 | 3.07 | 0.26 | 7.86 |
| Winter germination | phylogeny | 26.23 | 6.26 | 55.91 | 33.7 | 0 | 72.56 |
| population:species | 1.03 | 0 | 3.27 | 1.57 | 0 | 6.8 |
| Spring germination | phylogeny | 22.98 | 4.73 | 48.8 | 37.55 | 0 | 76.44 |
| population:species | 2.48 | 0.28 | 5.58 | 1.57 | 0 | 6.92 |
| Summer germination | phylogeny | 13.94 | 1.41 | 34.33 | 11.36 | 1.84 | 22.71 |
| population:species | 0.58 | 0 | 1.86 | 1.06 | 0 | 2.9 |
| Total germination | phylogeny | 22.93 | 4.89 | 49.38 | 18.79 | 6.87 | 33.22 |
| population:species | 1.52 | 0.38 | 3.24 | 0.64 | 0 | 1.8 |
| t50 | phylogeny | 1.2 | 0 | 2.68 | 0.54 | 0.1 | 1.19 |
| population:species | 0.27 | 0.04 | 0.64 | 0.16 | 0 | 0.36 |
| Environmental heat sum | phylogeny | 0.63 | 0 | 1.6 | 0.49 | 0 | 1.4 |
| population:species | 0.38 | 0.08 | 0.77 | 0.56 | 0.14 | 1.11 |

**Methods S1** R scripts for analysis and visualization

Fig. 5 System model size effects of incubator, system and their interaction according to the MCMC-glmm analysis of the data. Dots indicate mean effect size and whiskers are 95 % credible intervals (CI). The vertical dashed line marks the zero effect: when the CI crosses the zero-line, the effect is not significant. In Incubator, negative values mean higher germination in fellfield conditions while positive values mean higher germination in snowbed conditions. In system, negative values mean higher germination in the Mediterranean system while positive values mean higher germination in the Temperate system. In Interaction, negative values means lower germination of temperate species in snowbed conditions and positive values mean higher germination of temperate species in snowbed conditions.

Gráfico, Diagrama

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