Supplementary material

Table A1: Variable loadings and correlations between each variable and the two axes of a principal component analysis (PCA) performed on soil temperature and soil moisture.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variables | PC1  Eigenvalue = 1.369 | | PC2  Eigenvalue = 0.631 | |
| Loading | Correlation | Loading | Correlation |
| Soil temperature | 0.707 | 0.827 | 0.707 | 0.562 |
| Soil moisture | -0.707 | -0.827 | 0.707 | 0.562 |

Table A2: Results of a piecewise structural equation model (piecewise SEM) examining the relationships among microclimate (first and second axes of a PCA performed on soil temperature and soil moisture), *G. pneumonanthe* phenology and context (host ant abundance, density and phenology of neighboring host plants), occurrence of seed predation by *P. alcon*, and *G. pneumonanthe* reproductive performance (number of seeds per flower). All significant and non-significant predictors are shown. Pairs of variables with correlated errors (i.e. those not considered causal but which had a significant correlation) are denoted by ~~.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Response | Predictor | Unstandardized path coefficient | Standard error | Standardized path coefficient | P | R2 |
| Plant phenology | PC1 | 0.266 | 0.013 | 0.378 | <0.001 | 0.11 |
| PC2 | -0.534 | 0.020 | -0.385 | <0.001 |
| Ant abundance | PC1 | 0.525 | 0.026 | 0.106 | <0.001 | 0.04 |
| PC2 | -0.007 | 0.037 | -0.026 | 0.847 |
| Neighbor density | PC1 | -2.858 | 0.083 | -0.424 | <0.001 | 0.42 |
| PC2 | 8.720 | 0.122 | 0.670 | <0.001 |
| Neighbor phenology | PC1 | 0.264 | 0.003 | 0.598 | <0.001 | 0.67 |
| PC2 | -0.535 | 0.005 | -0.628 | <0.001 |
| Egg occurrence | Plant phenology | 0.865 | 0.051 | 0.291 | <0.001 | 0.45 |
| Ant abundance | -0.184 | 0.095 | -0.130 | 0.053 |
| Neighbor density | 0.090 | 0.045 | 0.283 | 0.050 |
| Neighbor phenology | -0.105 | 0.120 | -0.023 | 0.383 |
| PC1 | 0.255 | 0.043 | 0.120 | <0.001 |
| PC2 | 0.695 | 0.078 | 0.169 | <0.001 |
| Plant phenology Ant abundance | 0.045 | 0.019 | 0.042 | 0.012 |
| Neighbor density Neighbor phenology | -0.070 | 0.012 | -0.238 | <0.001 |
| Seeds per flower | Plant phenology | 14.770 | 9.603 | 0.068 | 0.125 | 0.19 |
| Egg occurrence | -197.745 | 20.692 | -0.435 | <0.001 |
| PC1 | -5.039 | 6.938 | -0.032 | 0.468 |
| PC2 | -12.127 | 12.996 | -0.040 | 0.351 |
| ~~ Neighbor phenology | ~~ Neighbor density | -0.143 |  | -0.143 | <0.001 |  |
| ~~ Plant phenology | ~~ Neighbor phenology | 0.236 |  | 0.236 | <0.001 |  |
| ~~ Neighbor phenology | ~~ Ant abundance | -0.048 |  | -0.048 | <0.001 |  |
| ~~ Neighbor density | ~~ Ant abundance | 0.081 |  | 0.081 | <0.001 |  |
| ~~ Plant phenology | ~~ Neighbor density | -0.041 |  | -0.041 | <0.001 |  |

Figure A1: Global piecewise structural equation model (piecewise SEM) examining the relationships among microclimate (first and second axes of a PCA performed on soil temperature and soil moisture), *G. pneumonanthe* phenology and context (host ant abundance, density and phenology of neighboring host plants), occurrence of seed predation by *P. alcon*, and *G. pneumonanthe* reproductive performance (number of seeds per flower). Alternative models were obtained by simplification of the global model through backwards stepwise removal of paths.

