Question: Is there is much genetic variation within populations and families for natural selection to act on?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Genetic variation within/among ALL** **populations** | | | |
| Population level | | Family level | |
| PVE | *p* | PVE | *p* |
| ***Growth traits*** | | | | |
| Height, before flowering | 1.404 | 0.207 | 9.45 | **<0.001** |
| Height, after flowering | 1.655 | 0.138 | 8.952 | **<0.001** |
| LDMC | 0.134 | 0.915 | 0 | 1 |
| Mortality\* | 7.667 | 0.786 | 21.311 | 0.805 |
| Ramets, before flowering\* | 5.303 | 0.342 | 16.478 | 0.328 |
| Ramets, after flowering\* | 2.08 | 0.16 | 8.065 | 0.137 |
| Relative growth rate | 0.265 | 0.632 | 0 | 1 |
| SLA | 0 | 1 | 0 | 1 |
| ***Herbivore community*** | | | | |
| *Danaus plexippus* abundance\* | 2.807 | 0.51 | 8.132 | 0.441 |
| *Labidomera clivicollis* abundance\* | 4.857 | 0.581 | 10.389 | 0.611 |
| *Liriomyza asclepiadis* abundance\* | 31.412 | 0.899 | 53.893 | 0.713 |
| ***Defense traits*** | | | | |
| Herbivory, before flowering: Binary\* | NA | **0.047** | NA | **0.047** |
| Herbivory, before flowering: Quantitative | 0.428 | 0.694 | 0.366 | 0.865 |
| Herbivory, after flowering: Binary\* | NA | 0.503 | NA | 0.5 |
| Herbivory, after flowering: Quantitative | 0 | 1 | 1.42 | 0.352 |
| Latex exudation | 3.942 | **0.039** | 4.612 | 0.169 |
| Weevil damage: Binary\* | 1.39 | 0.468 | 8.203 | 0.442 |
| Weevil damage: Quantitative | 0.707 | 0.53 | 3.35 | 0.108 |
| ***Reproductive traits*** | | | | |
| Date of first flower\* | NA | 0.706 | NA | 0.706 |
| Date of first follicle\* | 98.596 | *0.096* | 99.419 | 0.375 |
| Flower size | 10.815 | *0.078* | 16.205 | **0.028** |
| Flowering duration\* | NA | 0.688 | NA | 0.682 |
| Flowering success\* | 10.218 | 0.966 | 19.013 | 0.769 |
| Follicles\* | 0.807 | 0.920 | NA | 1 |
| Inflorescences\* | 15.658 | 0.512 | 20.343 | 0.519 |
| Mean flowers per inflorescence\* | NA | 0.212 | NA | 0.187 |

*PVE = percent variance explained*

\*Variables were analyzed with generalized linear mixed models. PVE was calculated as: random effect variance/(random effect variance + residual variance) with the *get\_variance()* function from the *insight* R package. Remaining variables were analyzed with general linear mixed models and PVE was calculated as: random effect variance/(random effect variance + residual variance) with the *VarCorr()* function from the *lme4* R package.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Genetic variation within/among ONLY URBAN populations and subtransects** | | | | |
| Population level | | Family level | | Transect level |
| PVE | *p* | PVE | *p* | *p* |
| ***Growth traits*** | | | | | |
| Height, before flowering | 0.967 | 0.448 | 9.721 | **<0.001** | 0.328 |
| Height, after flowering | 1.437 | 0.309 | 10.237 | **<0.001** | 0.36 |
| LDMC | 0 | 1 | 0.985 | 0.855 | 0.228 |
| Mortality\* | 7.748 | 0.321 | 24.011 | 0.149 | 0.881 |
| Ramets, before flowering\* | 6.993 | 0.102 | 18.643 | 0.137 | 0.228 |
| Ramets, after flowering\* | 2.082 | 0.102 | 8.629 | *0.094* | 0.477 |
| Relative growth rate | 0.719 | 0.306 | 0 | 1 | 0.319 |
| SLA | 1.109 | 0.548 | 0 | 1 | 0.115 |
| ***Herbivore community*** | | | | | |
| *Danaus plexippus* abundance\* | 1.468 | **0.038** | NA | **0.017** | 0.943 |
| *Labidomera clivicollis* abundance\* | 18.067 | **0.002** | NA | 1 | 0.308 |
| *Liriomyza asclepiadis* abundance\* | 34.65 | 0.846 | 54.868 | 1 | 0.708 |
| ***Defense traits*** | | | | | |
| Herbivory, before flowering: Binary\* | NA | 0.474 | NA | 0.706 | 0.621 |
| Herbivory, before flowering: Quantitative | 0 | 1 | 1.74 | 0.489 | 0.773 |
| Herbivory, after flowering: Binary\* | NA | 0.222 | NA | 0.394 | 0.45 |
| Herbivory, after flowering: Quantitative | 0 | 1 | 1.566 | 0.381 | *0.069* |
| Latex exudation | 3.261 | 0.165 | 6.95 | *0.09* | 0.822 |
| Weevil damage: Binary\* | 1.376 | 0.345 | 9.856 | 0.325 | 0.988 |
| Weevil damage: Quantitative | 0.843 | 0.53 | 2.673 | 0.295 | **0.028** |
| ***Reproductive traits*** | | | | | |
| Date of first flower\* | NA | 0.133 | NA | 0.133 | 0.743 |
| Date of first follicle\* | 99.996 | **0.027** | NA | **0.046** | **0.046** |
| Flower size | 12.988 | *0.087* | 15.078 | 0.057 | 0.445 |
| Flowering duration\* | NA | 0.121 | NA | 0.121 | **0.032** |
| Flowering success\* | 10.173 | 0.519 | 21.784 | 0.278 | 0.206 |
| Follicles\* | 5.031 | 0.139 | NA | 0.139 | 0.938 |
| Inflorescences\* | 12.776 | 0.127 | 15.581 | 0.134 | 0.534 |
| Mean flowers per inflorescence\* | NA | 0.136 | NA | 0.136 | 0.116 |