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| **Analyses for Models Associated with Prediction 1** | | | | |
| **(a) Response variable: Larval mass at day eight** | | | | |
| **Factor level** | **Mean mass (g)** | **Lower 95% CL** | **Upper 95% CL** | **Summary of effect** |
| Milkweed species = AINC | 0.332 | 0.260 | 0.424 | **χ² = 69.65, DF = 5,**  **p < 0.001** |
| Milkweed species = ASCU | 0.342 | 0.255 | 0.459 |
| Milkweed species = ASFA | 0.208 | 0.136 | 0.316 |
| Milkweed species = ASPEC | 0.102 | 0.070 | 0.148 |
| Milkweed species = ASYR | 0.158 | 0.124 | 0.202 |
| Milkweed species = GOPH | 0.265 | 0.219 | 0.320 |
| Monarch population = AU | 0.259 | 0.178 | 0.378 | **χ² = 32.51, DF = 5,**  **p < 0.001** |
| Monarch population = HI | 0.149 | 0.108 | 0.205 |
| Monarch population = GU | 0.244 | 0.174 | 0.342 |
| Monarch population = ENA | 0.319 | 0.232 | 0.438 |
| Monarch population = CA | 0.271 | 0.208 | 0.353 |
| Monarch population = PR | 0.124 | 0.086 | 0.180 |
| Sym/allo = allopatric | 0.198 | 0.165 | 0.236 | **χ² = 15.74, DF = 1,**  **p < 0.001** |
| Sym/allo = sympatric | 0.236 | 0.194 | 0.285 |
| Usage = first | 0.238 | 0.200 | 0.285 | **χ² = 14.99, DF = 1,**  **p < 0.001** |
| Usage = second | 0.195 | 0.160 | 0.238 |
| Greenhouse = 86W | 0.193 | 0.159 | 0.235 | **χ² = 12.43, DF = 1,**  **p < 0.001** |
| Greenhouse = Core | 0.241 | 0.200 | 0.290 |
| Year = 2017 | 0.271 | 0.203 | 0.362 | **χ² = 8.35, DF = 1,**  **p = 0.004** |
| Year = 2018 | 0.172 | 0.144 | 0.204 |
| Plant age (days) | NA | NA | NA | β = -0.114 ± 0.076,  t = -1.51, p = 0.134 |
| **(b) Response variable: Larval survival at day eight** | | | | |
| **Factor level** | **% Survival** | **Lower 95% CL** | **Upper 95% CL** | **Summary of Effect** |
| Milkweed species = AINC | 85.38 | 79.61 | 89.73 | **χ² = 23.11, DF = 5,**  **p < 0.001** |
| Milkweed species = ASCU | 80.04 | 74.65 | 84.52 |
| Milkweed species = ASFA | 79.01 | 72.92 | 84.04 |
| Milkweed species = ASPEC | 68.88 | 60.38 | 76.28 |
| Milkweed species = ASYR | 73.01 | 66.40 | 78.73 |
| Milkweed species = GOPH | 77.79 | 73.20 | 81.79 |
| Monarch population = AU | 83.11 | 75.27 | 88.83 | **χ² = 12.17, DF = 5,**  **p = 0.033** |
| Monarch population = HI | 68.18 | 59.10 | 76.05 |
| Monarch population = GU | 82.74 | 74.62 | 88.65 |
| Monarch population = ENA | 73.64 | 65.72 | 80.29 |
| Monarch population = CA | 74.31 | 67.25 | 80.29 |
| Monarch population = PR | 81.93 | 73.19 | 88.27 |
| Sym/allo = allopatric | 75.78 | 71.70 | 79.43 | **χ² = 3.97, DF = 1,**  **p = 0.046** |
| Sym/allo = sympatric | 79.69 | 74.90 | 83.77 |
| Usage = first | 79.90 | 76.41 | 82.98 | **χ² = 3.94, DF = 1,**  **p = 0.047** |
| Usage = second | 75.55 | 69.81 | 80.50 |
| Greenhouse = 86W | 75.65 | 70.47 | 80.17 | χ² = 3.68, DF = 1,  p = 0.054 |
| Greenhouse = Core | 79.81 | 75.74 | 83.34 |
| Year = 2017 | 74.32 | 66.90 | 80.57 | χ² = 3.49, DF = 1,  p = 0.062 |
| Year = 2018 | 80.92 | 77.38 | 84.02 |
| Plant age (days) | NA | NA | NA | β = -0.078 ± 0.115,  t = -0.68, p = 0.498 |
| **(c) Response variable: Days to eclosion** | | | | |
| **Factor level** | **Days to eclosion** | **Lower 95% CL** | **Upper 95% CL** | **Summary of Effect** |
| Milkweed species = AINC | 21.85 | 21.22 | 22.48 | **χ² = 62.71, DF = 5,**  **p < 0.001** |
| Milkweed species = ASCU | 21.35 | 20.60 | 22.10 |
| Milkweed species = ASFA | 22.43 | 21.34 | 23.52 |
| Milkweed species = ASPEC | 24.54 | 23.55 | 23.53 |
| Milkweed species = ASYR | 23.37 | 22.75 | 23.98 |
| Milkweed species = GOPH | 21.80 | 21.36 | 22.25 |
| Monarch population = AU | 22.54 | 21.75 | 23.32 | **χ² = 30.80, DF = 5,**  **p < 0.001** |
| Monarch population = HI | 23.20 | 22.52 | 23.87 |
| Monarch population = GU | 22.18 | 21.49 | 22.87 |
| Monarch population = ENA | 21.55 | 20.92 | 22.18 |
| Monarch population = CA | 22.19 | 21.63 | 22.75 |
| Monarch population = PR | 23.69 | 22.83 | 24.56 |
| Sym/allo = allopatric | 22.71 | 22.29 | 23.12 | **χ² = 4.81, DF = 1,**  **p = 0.028** |
| Sym/allo = sympatric | 22.41 | 21.95 | 22.87 |
| Usage = first | 22.47 | 22.07 | 22.87 | χ² = 1.22, DF = 1,  p = 0.271 |
| Usage = second | 22.64 | 22.16 | 23.13 |
| Greenhouse = 86W | 23.04 | 22.57 | 23.50 | **χ² = 29.40, DF = 1,**  **p < 0.001** |
| Greenhouse = Core | 22.08 | 21.64 | 22.52 |
| Year = 2017 | 21.69 | 21.05 | 22.33 | **χ² = 28.50, DF = 1,**  **p < 0.001** |
| Year = 2018 | 23.43 | 23.03 | 23.82 |
| Sex = female | 22.45 | 22.02 | 22.88 | **χ² = 5.63, DF = 1,**  **p = 0.018** |
| Sex = male | 22.67 | 22.24 | 23.10 |
| OE infection status (0-5) | NA | NA | NA | β = -0.004 ± 0.058,  t = -0.02, p > 0.90 |
| Plant age (days) | NA | NA | NA | β = 0.195 ± 0.180,  t = 1.08, p = 0.282 |
| **(d) Response variable: Eclosion mass** | | | | |
| **Factor level** | **Eclosion mass (g)** | **Lower 95% CL** | **Upper 95% CL** | **Summary of Effect** |
| Milkweed species = AINC | 0.571 | 0.543 | 0.598 | χ² = 8.97, DF = 5,  p = 0.010 |
| Milkweed species = ASCU | 0.564 | 0.533 | 0.595 |
| Milkweed species = ASFA | 0.551 | 0.506 | 0.597 |
| Milkweed species = ASPEC | 0.547 | 0.506 | 0.588 |
| Milkweed species = ASYR | 0.595 | 0.568 | 0.621 |
| Milkweed species = GOPH | 0.581 | 0.562 | 0.600 |
| Monarch population = AU | 0.555 | 0.521 | 0.589 | χ² = 9.83, DF = 5,  p = 0.080 |
| Monarch population = HI | 0.577 | 0.547 | 0.606 |
| Monarch population = GU | 0.580 | 0.550 | 0.611 |
| Monarch population = ENA | 0.588 | 0.561 | 0.615 |
| Monarch population = CA | 0.583 | 0.558 | 0.608 |
| Monarch population = PR | 0.526 | 0.488 | 0.564 |
| Sym/allo = allopatric | 0.568 | 0.550 | 0.586 | χ² = 0.01, DF = 1,  p > 0.90 |
| Sym/allo = sympatric | 0.568 | 0.547 | 0.588 |
| Usage = first | 0.567 | 0.550 | 0.584 | χ² = 0.11, DF = 1,  p = 0.744 |
| Usage = second | 0.569 | 0.548 | 0.591 |
| Greenhouse = 86W | 0.580 | 0.560 | 0.601 | **χ² = 9.29, DF = 1,**  **p = 0.002** |
| Greenhouse = Core | 0.556 | 0.537 | 0.575 |
| Year = 2017 | 0.569 | 0.542 | 0.597 | χ² = 0.03, DF = 1,  p = 0.856 |
| Year = 2018 | 0.567 | 0.550 | 0.583 |
| Sex = female | 0.543 | 0.525 | 0.562 | **χ² = 90.04, DF = 1,**  **p < 0.001** |
| Sex = male | 0.593 | 0.574 | 0.612 |
| OE infection status (0-5) | NA | NA | NA | **β = -6.47e-3 ± 3.22e-3, t = -2.01, p = 0.044** |
| Plant age (days) | NA | NA | NA | **β = -2.36e-2 ± 7.97e-3, t = -2.97, p = 0.004** |
| **(e) Response variable: Adult forewing area** | | | | |
| **Factor level** | **Forewing area (cm2)** | **Lower 95% CL** | **Upper 95% CL** | **Summary of Effect** |
| Milkweed species = AINC | 8.35 | 8.11 | 8.59 | χ² = 8.30, DF = 5,  p = 0.140 |
| Milkweed species = ASCU | 8.30 | 8.04 | 8.56 |
| Milkweed species = ASFA | 8.16 | 7.79 | 8.54 |
| Milkweed species = ASPEC | 8.31 | 7.97 | 8.66 |
| Milkweed species = ASYR | 8.59 | 8.36 | 8.82 |
| Milkweed species = GOPH | 8.41 | 8.24 | 8.57 |
| Monarch population = AU | 8.19 | 7.90 | 8.49 | **χ² = 49.80, DF = 5,**  **p < 0.001** |
| Monarch population = HI | 8.18 | 7.93 | 8.43 |
| Monarch population = GU | 8.38 | 8.12 | 8.65 |
| Monarch population = ENA | 8.84 | 8.61 | 9.07 |
| Monarch population = CA | 8.72 | 8.51 | 8.94 |
| Monarch population = PR | 7.80 | 7.48 | 8.13 |
| Sym/allo = allopatric | 8.38 | 8.22 | 8.53 | χ² = 0.47, DF = 1,  p = 0.490 |
| Sym/allo = sympatric | 8.33 | 8.16 | 8.51 |
| Usage = first | 8.38 | 8.24 | 8.53 | χ² = 0.11, DF = 1,  p = 0.407 |
| Usage = second | 8.32 | 8.14 | 8.51 |
| Greenhouse = 86W | 8.48 | 8.31 | 8.65 | **χ² = 12.42, DF = 1,**  **p < 0.001** |
| Greenhouse = Core | 8.23 | 8.07 | 8.39 |
| Year = 2017 | 8.32 | 8.08 | 8.56 | χ² = 0.31, DF = 1,  p = 0.577 |
| Year = 2018 | 8.39 | 8.25 | 8.53 |
| Sex = female | 8.20 | 8.05 | 8.36 | **χ² = 39.65, DF = 1,**  **p < 0.001** |
| Sex = male | 8.50 | 8.34 | 8.66 |
| OE infection status (0-5) | NA | NA | NA | β = -0.023 ± 0.029,  t = -0.815, p = 0.415 |
| Plant age (days) | NA | NA | NA | **β = -0.142 ± 0.070,**  **t = -2.04, p = 0.046** |
| **Table S5 –** Model averaged means for parameters of interest for (a) larval mass at day eight (b) larval survival to day eight (c) number of days to eclosion (d) mass at eclosion and (e) adult forewing area. For all categorical variables, we show marginal means and their 95% confidence intervals. The final column shows the results of likelihood ratio tests for categorical variables; for continuous predictor variables (plant age, OE infection status) we show model coefficients (± MSE) and t statistics. All preditors with p < 0.05 are shown in bold. | | | | |