Table 1: Test for variance among families and populations

Model: Monarch\_Quantity\_Observed ~ Block + (1 | Population) + (1 | Population:Fam\_uniq)

| Variable | Group | Variance | PVE | Ï‡2 | df | p |
| --- | --- | --- | --- | --- | --- | --- |
| Monarch butterfly: 2021 | Family | 0.002 | 0.083 | 0.000 | 1 | 0.5 |
| Population | NA | NA | 0.004 | 1 | 0.4765 |

Table 2: Assess how much variance is explained by urbanization

Urbanization = Distance to the City Center

Model: Monarch\_Quantity\_Observed ~ Block + (1 | Population) + (1 | Population:Fam\_uniq) + City\_dist

| Variable | Group | Variance | PVE | Ï‡2 | df | p |
| --- | --- | --- | --- | --- | --- | --- |
| Monarch butterfly: 2021 | Family | NA | NA | 0 | 1 | 0.5 |
| Population | NA | NA | 0 | 1 | 0.5 |

Table 3: Quantify variance explained by urbanization

| Variable | Predictor | Ï‡2 | p |
| --- | --- | --- | --- |
| Monarch butterfly: 2021 | Block | 25.459 | **<0.001\*\*\*** |
| Distance to City Center | 1.476 | 0.224 |

Table 4: Assess how much variance is explained by urbanization

Urbanization = Urbanization Score

Model: Monarch\_Quantity\_Observed ~ Block + (1 | Population) + (1 | Population:Fam\_uniq) + Urb\_score

| Variable | Group | Variance | PVE | Ï‡2 | df | p |
| --- | --- | --- | --- | --- | --- | --- |
| Monarch butterfly: 2021 | Family | NA | NA | 0 | 1 | 0.5 |
| Population | NA | NA | 0 | 1 | 0.5 |

Table 5: Quantify variance explained by urbanization

| Variable | Predictor | Ï‡2 | p |
| --- | --- | --- | --- |
| Monarch butterfly: 2021 | Block | 26.191 | **<0.001\*\*\*** |
| Urbanization Score | 2.146 | 0.143 |