Table S1: Chi-squared analysis of independence of the specific behaviors in different categories of behavior (e.g., degree of elevation of wings and degree of elevation of abdomen) thought to influence body temperature of *Arigomphus villosipes* males (see also Fig. 5). All comparisons indicate a highly significant degree of dependence between paired categories of behavior (Table 2). The significance of the association between pairs of specific behaviors (e.g., depressed wings with depressed abdomen) is evaluated using the very exacting criterion described for Fig. 1); cells with significant 2 at  = 0.05, 0.01, or 0.001 are highlighted.

**Wing Elevation**

|  |  |  |  |
| --- | --- | --- | --- |
| **Abdomen Elevation** | Depressed | Flat | Elevated |
|  |  |  |  |
| Depressed | 12 **/** 2.62  33.62, p<0.001 | 2****8.08  4.58, n.s. | 0 **/** 3.19  3.19, n.s. |
| Flat | 24 **/** 17.02  2.87, n.s. | 66 **/** 52.53  3.45. n.s. | 0 **/** 20.72  20.72, p<0.01 |
| Elevated | 10 **/** 21.88  6.45, n.s. | 73 **/** 67.54  0.422, n.s. | 1 **/** 0.951  0.0025, n.s. |
| Obelisk | 0 **/** 0.488  0.488, n.s. | 1 **/** 13.85  11.93, p<0.10 | 23 **/** 5.46  56.29, p<0.001 |

Table 2=148.69, p<<0.0001, df=6

**Stance**

|  |  |  |  |
| --- | --- | --- | --- |
| **Abdomen Elevation** | Crouching | Intermediate | Stilting |
|  |  |  |  |
| Depressed | 6 **/** 2.08  7.39, n.s. | 5****7.57  0.878, n.s. | 0 **/** 1.34  1.34, n.s. |
| Flat | 22 **/** 11.72  9.02, n.s. | 40 **/** 42.72  0.173. n.s. | 0 **/** 7.561  7.56, n.s. |
| Elevated | 3 **/** 13.99  8.63, n.s. | 67 **/** 50.99  5.03, n.s. | 4 **/** 9.02  2.80, n.s. |
| Obelisk | 0 **/** 3.21  3.21, n.s. | 1 **/** 11.71  9.80, n.s. | 16 **/** 2.07  93.56, p<0.001 |

Table 2=149.39, p<<0.0001, df=8

**Perching Angle**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Abdomen Elevation** | Perpendicular | Parallel,  Facing Sun | Angled,  Facing Sun | Angled, Facing Away | Parallel,  Facing Away |
|  |  |  |  |  |  |
| Depressed | 8 **/** 6.08  0.605, n.s. | 0 **/** 0.975  0.975, n.s. | 2 **/** 2.41  0.070, n.s. | 3 **/** 2.87  0.006, n.s. | 1 **/** 1.66  0.265, n.s. |
| Flat | 59 **/** 39.97  9.06, n.s. | 2 **/** 6.41  3.03, n.s. | 12 **/** 15.84  0.929, n.s. | 15 **/** 18.85  0.787, n.s. | 4 **/** 10.93  4.40, n.s. |
| Elevated | 38 **/** 49.09  2.51, n.s. | 14 **/** 7.87  4.77, n.s. | 26 **/** 19.45  2.21, n.s. | 23 **/** 23.16  0.001, n.s. | 12 **/** 13.43  0.152, n.s. |
| Obelisk | 1 **/** 10.86  8.95, n.s. | 1 **/** 1.74  0.316, n.s. | 2 **/** 4.303  1.23, n.s. | 9 **/** 5.12  2.93, n.s. | 12 **/** 2.97  27.44, p=0.001 |

Table 2=70.64, p<0.0001, df=12

**Perch Substrate**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Abdomen Elevation** | Dry Soil | Lilypad | Leaf | Moist Soil | Rock | Other |
|  |  |  |  |  |  |  |
| Depressed | 3 **/** 1.43  1.71, n.s. | 2 **/** 4.09  1.06, n.s. | 1 **/** 1.17  0.024, n.s. | 4 **/** 4.77  0.126, n.s. | 1 **/** 1.06  0.0035, n.s. | 2 **/** 0.478  4.85, n.s. |
| Flat | 16 **/** 10.03  3.55, n.s. | 21 **/** 28.60  2.13, n.s. | 21 **/** 28.6  2.13, n.s. | 44 **/** 33.43  3.34, n.s. | 5 **/** 7.43  0.794, n.s. | 1 **/** 3.34  1.64, n.s. |
| Elevated | 7 **/** 12.78  2.62, n.s. | 47 **/** 36.46  3.05, n.s. | 13 **/** 10.42  0.64, n.s. | 34 **/** 42.61  1.74, n.s. | 9 **/** 9.47  0.023, n.s. | 6 **/** 4.26  0.710, n.s. |
| Obelisk | 1 **/** 2.76  1.12, n.s. | 7 **/** 7.86  0.094, n.s. | 4 **/** 2.44  1.37, n.s. | 8 **/** 9.18  0.153, n.s. | 5 **/** 2.04  4.29, n.s. | 0 **/** 0.918  0.918, n.s. |

Table 2=38.00, p<0.0009, df=15

**Wing Elevation**

|  |  |  |  |
| --- | --- | --- | --- |
| **Perching Angle** | Depressed | Flat | Elevated |
|  |  |  |  |
| Perpendicular | 33 **/** 21.16  6.63, n.s. | 67 **/** 61.27  0.535, n.s. | 6 **/** 24.69  14.14, n.s. |
| Parallel, Facing Sun | 1 **/** 3.33  1.63, n.s. | 13 **/** 9.64  1.17, n.s. | 3 **/** 3.89  0.202, n.s. |
| Angled, Facing Sun | 10 **/** 8.23  0.381, n.s. | 17 **/** 23.83  1.96, n.s. | 15 **/** 9.60  3.04, n.s. |
| Angled, Facing Away | 3 **/** 9.60  4.537, n.s. | 30 **/** 27.8  0.174, n.s. | 16 **/** 11.20  2.06, n.s. |
| Parallel, Facing Away | 1 **/** 5.68  3.86, n.s. | 12 **/** 16.45  1.21, n.s. | 16 **/** 6.63  13.25, n.s. |

Table 2=54.69, p<0.0001, df=8

**Stance**

|  |  |  |  |
| --- | --- | --- | --- |
| **Perching Angle** | Crouching | Intermediate | Stilting |
|  |  |  |  |
| Perpendicular | 26 **/** 14.51  9.09, n.s. | 42 **/** 46.95  0.522, n.s. | 2 **/** 8.54  5.01, n.s. |
| Parallel, Facing Sun | 2 **/** 3,32  0.523, n.s. | 13 **/** 10.73  0.479, n.s. | 1 **/** 1.95  0.464, n.s. |
| Angled, Facing Sun | 5 **/** 6.01  0.170, n.s. | 22 **/** 19.45  0.334, n.s. | 2 **/** 3.54  0.668, n.s. |
| Angled, Facing Away | 1 **/** 7.26  5.39, n.s. | 27 **/** 23.48  0.529, n.s. | 7 **/** 4.27  1.75, n.s. |
| Parallel, Facing Away | 0 **/** 2.90  2.90, n.s. | 6 **/** 9.39  1.22, n.s. | 8 **/** 23.19  4.88, n.s. |

Table 2=52.25, p<0.0001, df=8

**Perch Substrate**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Perching Angle** | Dry Soil | Lilypad | Leaf | Moist Soil | Rock | Other |
|  |  |  |  |  |  |  |
| Perpendicular | 18 **/** 13.22  1.72, n.s. | 37 **/** 34.38  1.99, n.s. | 2 **/** 8.38  4.85, n.s. | 40 **/** 39.67  0.003. n.s. | 9 **/** 8.38  0.047, n.s. | 2 **/** 3.97  0.976, n.s. |
| Parallel, Facing Sun | 1 **/** 2.08  0.561, n.s. | 5 **/** 5.41  0.031, n.s. | 1 **/** 1.32  0.077, n.s. | 5 **/** 6.24  0.248, n.s. | 3 **/** 1.32  2.14, n.s. | 2 **/** 0.624  3.03, n.s. |
| Angled, Facing Sun | 1 **/** 5.14  3.34, n.s. | 116 **/** 13.37  0.517, n.s. | 9 **/** 3.26  10.13, n.s. | 15 **/** 14.43  0.132, n.s. | 1 **/** 3.26  1.56, n.s. | 1 **/** 1.54  0.191, n.s. |
| Angled, Facing Away | 9 **/** 6.00  1.50, n.s. | 9 **/** 15.60  2.79, n.s. | 4 **/**3.80  0.010, n.s. | 21 **/** 18.00  0.500, n.s. | 4 **/** 3.80  0.010, n.s. | 2 **/** 1.8  0.022, n.s. |
| Parallel, Facing Away | 1 **/** 3.55  1.83, n.s. | 11 **/** 9.23  0.338, n.s. | 3 **/** 2.25  0.251, n.s. | 10 **/** 10.65  0.040, n.s. | 2 **/** 2.25  0.028, n.s. | 2 **/** 1.07  0.820, n.s. |

Table 2=34.91, p=0.0091, df=20

**Perch Substrate**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Wing** | Dry Soil | Lilypad | Leaf | Moist Soil | Rock | Other |
|  |  |  |  |  |  |  |
| Depressed | 13 **/** 5.73  9.22, n.s. | 8 **/** 14.71  3.06, n.s. | 2 **/** 4.01  1.01, n.s. | 21 **/** 17.00  0.939, n.s. | 1 **/** 3.82  2.08, n.s. | 2 **/** 1.72  0.046, n.s. |
| Flat | 15 / 17.20  0.280, n.s. | 45 **/** 44.13  0.017, n.s. | 13 **/** 12.04  0.077, n.s. | 53 **/** 51.01  0.078, n.s. | 10 **/** 11.46  0.187, n.s. | 5 **/** 5.16  0.0049, n.s. |
| Elevated | 1 / 6.83  4.98, n.s. | 24 **/** 17.53  2.39, n.s. | 6 **/** 4.71  0.311, n.s. | 15 **/** 20.26  1.366, n.s. | 8 **/** 4.55  2.61, n.s. | 2 **/** 2.05  0.0012, n.s. |

Table 2=30.25, p<0.005, df=10

**Perch Substrate**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Stance** | Dry Soil | Lilypad | Leaf | Moist Soil | Rock | Other |
|  |  |  |  |  |  |  |
| Crouching | 14 **/** 4.10  23.94, p<0.01 | 2 **/** 10.65  7.03, n.s. | 0 **/** 3.00  3.00, n.s. | 13 **/** 12.29  0.041, n.s. | 4 **/** 2.73  0.590, n.s. | 1 **/** 1.23  0.043, n.s. |
| Intermediate | 8 **/** 13.49  2.24, n.s. | 35 **/** 35.08  0.0002, n.s. | 15 **/** 9.90  2.63, n.s. | 44 **/** 40.48  0.306, n.s. | 7 **/** 9.00  0.443, n.s. | 3 **/** 4.05  0.271, n.s. |
| Stilting | 0 **/** 2.42  2.41, n.s. | 4 **/** 6.27  0.819, n.s. | 3 **/** 1.77  0.806, n.s. | 9 **/** 7.23  0.434, n.s. | 4 **/** 1.61  3.57, n.s. | 0 **/** 0.723  0.723, n.s. |

Table 2=55.91, p<0.0001, df=10

**Stance**

|  |  |  |  |
| --- | --- | --- | --- |
| **Wing Elevation** | Crouching | Intermediate | Stilting |
|  |  |  |  |
| Depressed | 26 / 7.17  49.47, p<0.001 | 9 / 23.61  9.04, n.s. | 0 / 4.22  4.22, n.s. |
| Flat | 6 / 20.07  9.87, p<0.05 | 91 / 66.12  9.36, n.s. | 1 / 11.81  9.89, p<0.05 |
| Elevated | 0 / 6.34  6.34, n.s. | 12 / 20.92  3.80, n.s. | 19 / 3.73  62.39, p<0.001 |

Table 2=164.39, p<0.0001, df=4