**Supplementary Information**

**S1**

*(The tables A1-22 in the supplemental data (S1) do not show that the sum of numbers of cve, non-cve and dead flies equals the total pupae collected. They merely lists out the following: (i) the total number of pupae collected (over several time-points) for heat shock in a particular generation, (ii) the number of cve and non-cve males/females scored following eclosion, (iii) and the number of pupae that failed to eclose. Apart from this, in every generation there were many flies that expressed alternate phenotypes, different from cve.)*

**Table A.1: Upward selection line data from parent (P) generation.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time-points** |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **P** | **Total** |  | **1602** | **110** | **78** | **489** | **564** | **335** |
|  |  |  |  |  |  |  |  |  |
|  | I | 9:15 am | **18** | 0 | 1 | 4 | 7 | 6 |
|  | I | 10:45 am | **4** | 0 | 0 | 3 | 1 | 0 |
|  | I | 11:30 am | **5** | 1 | 1 | 2 | 1 | 0 |
|  | I | 1:30 pm | **40** | 1 | 0 | 5 | 33 | 1 |
|  | I | 2:30 pm | **28** | 3 | 1 | 8 | 13 | 3 |
|  | I | 3:30 pm | **37** | 3 | 2 | 7 | 12 | 13 |
|  | I | 4:30 pm | **38** | 1 | 0 | 12 | 15 | 10 |
|  |  |  |  |  |  |  |  |  |
|  | II | 5:15 am | **63** | 12 | 0 | 15 | 18 | 18 |
|  | II | 6:00 am | **42** | 1 | 0 | 12 | 20 | 9 |
|  | II | 7:10 am | **67** | 2 | 1 | 20 | 34 | 10 |
|  | II | 8:30 am | **48** | 0 | 1 | 16 | 32 | 0 |
|  | II | 9:30 am | **44** | 1 | 2 | 19 | 22 | 0 |
|  | II | 10:30 am | **4** | 2 | 0 | 1 | 1 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | II | 9:15 am | **21** | 0 | 1 | 7 | 12 | 1 |
|  | III | 10:00 am | **8** | 0 | 0 | 2 | 6 | 0 |
|  | III | 10:45 am | **30** | 1 | 3 | 14 | 11 | 1 |
|  | III | 11:30 am | **17** | 0 | 3 | 4 | 3 | 7 |
|  | III | 12:15 pm | **19** | 0 | 6 | 2 | 2 | 9 |
|  | III | 1:00 pm | **18** | 3 | 0 | 11 | 4 | 0 |
|  | III | 1:45 pm | **0** | 0 | 0 | 0 | 0 | 0 |
|  | III | 2:30 pm | **19** | 0 | 6 | 4 | 4 | 5 |
|  | III | 3:15 pm | **12** | 6 | 2 | 2 | 1 | 1 |
|  | III | 4:00 pm | **22** | 0 | 0 | 12 | 9 | 1 |
|  | III | 4:45 pm | **14** | 2 | 0 | 4 | 5 | 3 |
|  | III | 5:30 pm | **22** | 2 | 1 | 3 | 4 | 12 |
|  | III | 6:15 pm | **15** | 2 | 0 | 3 | 5 | 5 |
|  | III | 7:00 pm | **15** | 0 | 0 | 5 | 10 | 0 |
|  | III | 7:45 pm | **28** | 6 | 1 | 16 | 4 | 1 |
|  |  |  |  |  |  |  |  |  |
|  | IV | 5:15 am | **48** | 6 | 4 | 14 | 20 | 4 |
|  | IV | 6:30 am | **54** | 3 | 1 | 20 | 16 | 4 |
|  | IV | 7:15 am | **32** | 6 | 3 | 1 | 2 | 20 |
|  | IV | 8:30 am | **47** | 0 | 3 | 16 | 22 | 8 |
|  | IV | 9:15 am | **22** | 5 | 1 | 5 | 3 | 8 |
|  | IV | 10:00 am | **12** | 0 | 6 | 3 | 2 | 1 |
|  | IV | 10:45 am | **12** | 0 | 1 | 4 | 4 | 3 |
|  | IV | 11:30 am | **32** | 2 | 0 | 4 | 3 | 1 |
|  | IV | 12:15 pm | **20** | 4 | 5 | 4 | 2 | 5 |
|  | IV | 1:00 pm | **19** | 0 | 0 | 8 | 9 | 2 |
|  | IV | 1:45 pm | **10** | 1 | 1 | 2 | 4 | 2 |
|  | IV | 2:30 pm | **11** | 1 | 0 | 6 | 3 | 1 |
|  | IV | 3:15 pm | **11** | 0 | 1 | 6 | 4 | 0 |
|  | IV | 4:00 pm | **19** | 1 | 1 | 11 | 4 | 2 |
|  | IV | 4:45 pm | **8** | 0 | 1 | 3 | 4 | 0 |
|  | IV | 5:30 pm | **19** | 0 | 2 | 11 | 5 | 1 |
|  | IV | 6:15 pm | **15** | 0 | 3 | 8 | 2 | 2 |
|  | IV | 7:00 pm | **15** | 2 | 0 | 8 | 4 | 1 |
|  | IV | 7:45 pm | **28** | 0 | 2 | 14 | 2 | 10 |
|  |  |  |  |  |  |  |  |  |
|  | V | 9:15 am | **18** | 0 | 1 | 6 | 6 | 5 |
|  | V | 10:00 am | **10** | 0 | 1 | 2 | 4 | 3 |
|  | V | 10:45 am | **16** | 2 | 1 | 4 | 3 | 6 |
|  | V | 11:30 am | **17** | 1 | 1 | 7 | 4 | 4 |
|  | V | 12:15 pm | **12** | 3 | 1 | 2 | 1 | 5 |
|  | V | 1:00 pm | **25** | 1 | 2 | 10 | 9 | 3 |
|  | V | 1:45 pm | **11** | 1 | 0 | 3 | 3 | 4 |
|  | V | 2:30 pm | **11** | 2 | 0 | 2 | 4 | 3 |
|  | V | 3:15 pm | **17** | 1 | 2 | 4 | 8 | 2 |
|  | V | 4:00 pm | **10** | 0 | 0 | 4 | 4 | 2 |
|  | V | 4:45 pm | **7** | 1 | 0 | 1 | 5 | 0 |
|  | V | 5:30 pm | **8** | 1 | 0 | 2 | 1 | 4 |
|  | V | 6:15 pm | **9** | 0 | 0 | 6 | 5 | 0 |
|  | V | 7:00 pm | **7** | 0 | 0 | 0 | 0 | 7 |
|  |  |  |  |  |  |  |  |  |
|  | VI | 9:15 am | **45** | 0 | 1 | 4 | 10 | 31 |
|  | VI | 10:00 am | **38** | 1 | 0 | 10 | 15 | 12 |
|  | VI | 10:45 am | **52** | 2 | 0 | 17 | 23 | 10 |
|  | VI | 11:30 am | **14** | 2 | 0 | 4 | 5 | 3 |
|  | VI | 12:15 pm | **35** | 0 | 0 | 18 | 10 | 7 |
|  | VI | 1:00 pm | **41** | 2 | 0 | 8 | 22 | 9 |
|  | VI | 1:45 pm | **18** | 0 | 0 | 6 | 9 | 3 |
|  | VI | 2:30 pm | **11** | 0 | 1 | 2 | 1 | 7 |
|  | VI | 3:15 pm | **22** | 4 | 0 | 5 | 8 | 5 |
|  | VI | 4:30 pm | **16** | 6 | 0 | 1 | 0 | 9 |

Calculation for the percentage of crossveinless (cve) from generation, P:

%cve = ncve/(ncve+nnon-cve), where n is the total number of flies (cve or non-cve)

= 188/(188+1053) = 15.14%

**Table A.2:** **Upward selection line data from generation F1.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae**  **collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time-points** |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **F1** | **Total** |  | **638** | **102** | **70** | **187** | **197** | **80** |
|  |  |  |  |  |  |  |  |  |
|  | I | 8:30 am | **4** | 0 | 1 | 0 | 0 | 3 |
|  | I | 9:15 am | **5** | 2 | 0 | 2 | 1 | 0 |
|  | I | 10:00 am | **5** | 2 | 0 | 0 | 2 | 1 |
|  | I | 10:45 am | **9** | 0 | 0 | 5 | 4 | 0 |
|  | I | 11:30 am | **5** | 0 | 0 | 1 | 4 | 0 |
|  | I | 12:15 pm | **2** | 0 | 1 | 0 | 0 | 1 |
|  | I | 1:00 pm | **2** | 1 | 0 | 0 | 0 | 1 |
|  | I | 1:45 pm | **5** | 1 | 2 | 1 | 1 | 0 |
|  | I | 2:15 pm | **5** | 1 | 2 | 1 | 0 | 1 |
|  | I | 3:00 pm | **4** | 0 | 1 | 0 | 3 | 0 |
|  | I | 3:45 pm | **5** | 1 | 2 | 0 | 1 | 1 |
|  |  |  |  |  |  |  |  |  |
|  | II | 6:30 am | **15** | 1 | 0 | 8 | 6 | 0 |
|  | II | 8:30 am | **19** | 0 | 1 | 5 | 9 | 4 |
|  | II | 9:15 am | **20** | 2 | 0 | 6 | 12 | 0 |
|  | II | 11:00 am | **23** | 1 | 0 | 6 | 10 | 6 |
|  | II | 11:45 am | **26** | 3 | 0 | 19 | 3 | 1 |
|  | II | 12:15 pm | **18** | 8 | 0 | 3 | 2 | 3 |
|  | II | 1:00 pm | **33** | 11 | 1 | 8 | 10 | 3 |
|  | II | 1:45 pm | **29** | 4 | 1 | 13 | 10 | 1 |
|  | II | 2:15 pm | **20** | 2 | 2 | 12 | 2 | 2 |
|  | II | 3:00 pm | **20** | 1 | 4 | 3 | 4 | 8 |
|  | II | 3:45 pm | **26** | 1 | 0 | 6 | 18 | 1 |
|  |  |  |  |  |  |  |  |  |
|  | III | 8:35 am | **17** | 1 | 1 | 8 | 6 | 1 |
|  | III | 9:15 am | **13** | 2 | 3 | 1 | 3 | 3 |
|  | III | 10:00 am | **10** | 6 | 2 | 0 | 1 | 1 |
|  | III | 11:00 am | **11** | 1 | 2 | 2 | 4 | 3 |
|  | III | 12:15 pm | **18** | 4 | 7 | 1 | 4 | 2 |
|  | III | 1:00 pm | **5** | 2 | 0 | 2 | 1 | 0 |
|  | III | 1:45 pm | **12** | 1 | 0 | 1 | 3 | 7 |
|  | III | 2:30 pm | **10** | 0 | 1 | 6 | 2 | 1 |
|  |  |  |  |  |  |  |  |  |
|  | IV | 8:30 am | **33** | 2 | 2 | 9 | 12 | 6 |
|  | IV | 9:15 am | **25** | 1 | 4 | 10 | 4 | 6 |
|  | IV | 10:00 am | **28** | 4 | 2 | 12 | 11 | 1 |
|  | IV | 11:00 am | **31** | 10 | 7 | 5 | 8 | 1 |
|  | IV | 12:15 pm | **29** | 1 | 8 | 5 | 13 | 2 |
|  | IV | 1:00 pm | **30** | 12 | 8 | 3 | 2 | 5 |
|  | IV | 1:45 pm | **28** | 8 | 2 | 5 | 12 | 1 |
|  | IV | 3:00 pm | **38** | 5 | 3 | 18 | 9 | 3 |

Calculation for the percentage of crossveinless (cve) from generation, F1:

%cve = ncve/(ncve+nnon-cve), where n is the total number of flies (cve or non-cve)

= 172/(172+384) = 30.93%

**Table A.3:** **Upward selection line data from generation F2**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time-points** |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **F2** | **Total** |  | **480** | **90** | **66** | **105** | **120** | **99** |
|  |  |  |  |  |  |  |  |  |
|  | I | 10:15 am | **4** | 1 | 0 | 1 | 1 | 1 |
|  | I | 11:55 am | **3** | 2 | 1 | 0 | 0 | 0 |
|  | I | 4:45 pm | **4** | 2 | 0 | 1 | 1 | 0 |
|  | I | 5:30 pm | **5** | 0 | 0 | 1 | 3 | 1 |
|  | I | 6:15 pm | **2** | 0 | 0 | 1 | 0 | 1 |
|  | I | 7:00 pm | **2** | 0 | 0 | 1 | 1 | 0 |
|  | I | 8:00 pm | **11** | 1 | 1 | 2 | 3 | 5 |
|  |  |  |  |  |  |  |  |  |
|  | II | 8:45 am | **6** | 0 | 0 | 0 | 0 | 6 |
|  | II | 9:30 am | **5** | 0 | 2 | 1 | 1 | 1 |
|  | II | 10:15 am | **10** | 2 | 0 | 3 | 4 | 1 |
|  | II | 11:30 am | **6** | 0 | 0 | 1 | 4 | 1 |
|  | II | 12:15 pm | **2** | 2 | 0 | 0 | 0 | 0 |
|  | II | 1:00 pm | **9** | 1 | 1 | 2 | 3 | 2 |
|  | II | 1:45 pm | **3** | 0 | 0 | 2 | 1 | 0 |
|  | II | 2:30 pm | **6** | 1 | 1 | 1 | 1 | 2 |
|  | II | 4:30 pm | **10** | 2 | 1 | 2 | 3 | 2 |
|  | II | 5:30 pm | **4** | 2 | 0 | 1 | 1 | 0 |
|  | II | 6:15 pm | **4** | 0 | 2 | 0 | 2 | 0 |
|  | II | 7:00 pm | **3** | 1 | 0 | 0 | 2 | 0 |
|  | II | 7:45 pm | **2** | 1 | 0 | 0 | 1 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | III | 8:30 am | **14** | 1 | 0 | 7 | 6 | 0 |
|  | III | 9:15 am | **9** | 1 | 2 | 3 | 1 | 2 |
|  | III | 10:00 am | **10** | 3 | 2 | 2 | 3 | 0 |
|  | III | 10:45 am | **7** | 1 | 0 | 3 | 2 | 1 |
|  | III | 11:30 am | **6** | 3 | 0 | 1 | 0 | 2 |
|  | III | 12:15 pm | **17** | 3 | 6 | 2 | 3 | 3 |
|  | III | 1:00 pm | **9** | 0 | 0 | 1 | 7 | 0 |
|  | III | 1:45 pm | **9** | 1 | 0 | 3 | 3 | 2 |
|  | III | 2:30 pm | **18** | 11 | 2 | 0 | 2 | 3 |
|  | III | 4:30 pm | **2** | 0 | 0 | 2 | 0 | 0 |
|  | III | 5:15 pm | **5** | 2 | 0 | 2 | 1 | 0 |
|  | III | 6:00 pm | **9** | 4 | 1 | 1 | 2 | 1 |
|  |  |  |  |  |  |  |  |  |
|  | IV | 8:30 am | **8** | 1 | 2 | 3 | 2 | 0 |
|  | IV | 9:15 am | **8** | 2 | 0 | 3 | 1 | 2 |
|  | IV | 10:00 am | **6** | 0 | 1 | 2 | 3 | 0 |
|  | IV | 10:45 am | **6** | 0 | 1 | 1 | 3 | 1 |
|  | IV | 11:30 am | **8** | 1 | 1 | 0 | 0 | 6 |
|  | IV | 12:15 pm | **15** | 5 | 4 | 3 | 2 | 1 |
|  | IV | 1:00 pm | **11** | 3 | 0 | 3 | 4 | 1 |
|  | IV | 1:45 pm | **7** | 0 | 0 | 0 | 0 | 7 |
|  | IV | 2:30 pm | **5** | 1 | 0 | 1 | 3 | 0 |
|  | IV | 4:30 pm | **12** | 4 | 1 | 2 | 4 | 1 |
|  | IV | 5:15 pm | **9** | 2 | 0 | 0 | 0 | 7 |
|  | IV | 6:00 pm | **5** | 0 | 1 | 2 | 2 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | V | 8:30 am | **16** | 1 | 3 | 9 | 3 | 7 |
|  | V | 10:00 am | **9** | 1 | 2 | 2 | 2 | 2 |
|  | V | 10:45 am | **14** | 2 | 2 | 5 | 5 | 1 |
|  | V | 12:15 pm | **13** | 1 | 4 | 0 | 0 | 7 |
|  | V | 1:00 pm | **11** | 0 | 0 | 2 | 9 | 0 |
|  | V | 1:45 pm | **8** | 1 | 3 | 1 | 3 | 0 |
|  | V | 2:30 pm | **8** | 1 | 1 | 2 | 3 | 1 |
|  | V | 3:45 pm | **12** | 2 | 0 | 3 | 4 | 3 |
|  | V | 4:30 pm | **9** | 3 | 4 | 1 | 0 | 1 |
|  | V | 5:15 pm | **15** | 2 | 3 | 4 | 1 | 5 |
|  |  |  |  |  |  |  |  |  |
|  | VI | 9:15 am | **15** | 1 | 5 | 4 | 0 | 5 |
|  | VI | 10:00 am | **5** | 1 | 1 | 0 | 2 | 1 |
|  | VI | 10:45 am | **7** | 1 | 1 | 3 | 2 | 0 |
|  | VI | 12:15 pm | **15** | 6 | 4 | 2 | 0 | 3 |

Calculation for the percentage of crossveinless (cve) from generation, F2:

%cve = ncve/(ncve+nnon-cve), where n is the total number of flies (cve or non-cve)

= 156/(156+225) = 40.94%

**Table A.4:** **Upward selection line data from generation F3. Cve females collected 5 days a.p and males 6-7 days a.p**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time-points** |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **F3** | **Total** |  | **462** | **132** | **97** | **70** | **80** | **82** |
|  |  |  |  |  |  |  |  |  |
|  | I | 9:00 am | **9** | 0 | 4 | 0 | 0 | 5 |
|  | I | 9:45 am | **1** | 0 | 0 | 0 | 0 | 1 |
|  | I | 11:30 am | **4** | 0 | 1 | 1 | 1 | 1 |
|  | I | 12:15 pm | **2** | 0 | 0 | 0 | 0 | 2 |
|  | I | 1:00 pm | **3** | 0 | 0 | 0 | 3 | 0 |
|  | I | 4:00 pm | **5** | 2 | 0 | 0 | 2 | 1 |
|  |  |  |  |  |  |  |  |  |
|  | II | 9:15 am | **11** | 2 | 4 | 2 | 3 | 0 |
|  | II | 12:15 pm | **4** | 0 | 1 | 0 | 0 | 3 |
|  | II | 1:00 pm | **3** | 1 | 1 | 1 | 0 | 0 |
|  | II | 3:00 pm | **3** | 0 | 2 | 1 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | III | 8:30 am | **14** | 4 | 1 | 3 | 5 | 1 |
|  | III | 9:15 am | **2** | 0 | 1 | 1 | 0 | 0 |
|  | III | 10:00 am | **3** | 0 | 0 | 1 | 1 | 1 |
|  | III | 10:45 am | **12** | 0 | 0 | 0 | 0 | 12 |
|  | III | 11:30 am | **1** | 1 | 0 | 0 | 0 | 0 |
|  | III | 12:15 pm | **11** | 2 | 1 | 0 | 0 | 8 |
|  | III | 1:00 pm | **10** | 3 | 0 | 5 | 2 | 0 |
|  | III | 1:45 pm | **9** | 1 | 3 | 3 | 2 | 0 |
|  | III | 2:30 pm | **6** | 1 | 1 | 1 | 1 | 2 |
|  | III | 3:15 pm | **4** | 1 | 0 | 2 | 1 | 0 |
|  | III | 4:00 pm | **6** | 3 | 2 | 0 | 1 | 0 |
|  | III | 4:30 pm | **9** | 3 | 4 | 2 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | IV | 9:15 am | **17** | 3 | 7 | 2 | 2 | 3 |
|  | IV | 10:00 am | **10** | 4 | 2 | 2 | 2 | 0 |
|  | IV | 10:45 am | **12** | 3 | 3 | 1 | 3 | 2 |
|  | IV | 11:30 am | **13** | 5 | 0 | 2 | 4 | 2 |
|  | IV | 12:15 pm | **9** | 2 | 4 | 0 | 0 | 3 |
|  | IV | 1:00 pm | **13** | 2 | 1 | 5 | 4 | 1 |
|  | IV | 1:45 pm | **7** | 1 | 2 | 1 | 2 | 1 |
|  | IV | 2:30 pm | **13** | 6 | 3 | 0 | 1 | 3 |
|  | IV | 3:15 pm | **5** | 2 | 0 | 0 | 3 | 0 |
|  | IV | 4:00 pm | **18** | 10 | 2 | 0 | 1 | 5 |
|  |  |  |  |  |  |  |  |  |
|  | V | 10:00 am | **12** | 5 | 2 | 0 | 1 | 4 |
|  | V | 10:45 am | **6** | 0 | 2 | 2 | 2 | 0 |
|  | V | 11:30 am | **3** | 3 | 0 | 0 | 0 | 0 |
|  | V | 12:15 pm | **5** | 0 | 0 | 4 | 1 | 0 |
|  | V | 1:00 pm | **6** | 1 | 3 | 0 | 2 | 0 |
|  | V | 2:00 pm | **8** | 2 | 0 | 4 | 2 | 0 |
|  | V | 3:15 pm | **11** | 5 | 2 | 3 | 1 | 0 |
|  | V | 4:30 pm | **10** | 5 | 4 | 0 | 1 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | VI | 11:30 am | **17** | 4 | 4 | 1 | 1 | 7 |
|  | VI | 12:15 pm | **15** | 6 | 4 | 1 | 3 | 1 |
|  | VI | 1:00 pm | **9** | 5 | 3 | 0 | 0 | 1 |
|  | VI | 1:45 pm | **13** | 4 | 4 | 3 | 2 | 0 |
|  | VI | 2:30 pm | **6** | 2 | 1 | 1 | 1 | 1 |
|  |  |  |  |  |  |  |  |  |
|  | VII | 9:30 am | **7** | 0 | 1 | 1 | 4 | 1 |
|  | VII | 11:30 am | **3** | 1 | 1 | 0 | 1 | 0 |
|  | VII | 1:00 pm | **11** | 4 | 2 | 4 | 1 | 0 |
|  | VII | 1:45 pm | **8** | 2 | 1 | 0 | 0 | 5 |
|  | VII | 2:30 pm | **11** | 4 | 2 | 1 | 4 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | VIII | 9:30 am | **11** | 4 | 2 | 4 | 1 | 0 |
|  | VIII | 10:00 am | **10** | 5 | 1 | 2 | 2 | 0 |
|  | VIII | 11:15 am | **5** | 1 | 0 | 0 | 3 | 1 |
|  | VIII | 1:00 pm | **8** | 2 | 2 | 0 | 2 | 1 |
|  | VIII | 2:30 pm | **18** | 5 | 6 | 3 | 1 | 3 |

Calculation for the percentage of crossveinless (cve) from generation, F3:

%cve = ncve/(ncve+nnon-cve), where n is the total number of flies (cve or non-cve)

= 229/(229+150) = 60.42%

**Table A.5:** **Upward selection line data from generation F4. Cve females collected 5 days a.p and males 6-7 days a.p**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae**  **collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time-points** |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **F4** | **Total** |  | **399** | **130** | **92** | **25** | **58** | **83** |
|  | I | 8:30 am | **5** | 2 | 3 | 0 | 0 | 0 |
|  | I | 9:15 am | **2** | 1 | 0 | 0 | 0 | 1 |
|  | I | 10:00 am | **3** | 1 | 2 | 0 | 0 | 0 |
|  | I | 10:45 am | **10** | 0 | 0 | 0 | 0 | 10 |
|  | I | 11:30 am | **2** | 1 | 0 | 0 | 1 | 0 |
|  | I | 12:15 pm | **6** | 5 | 1 | 0 | 0 | 0 |
|  | I | 1:00 pm | **2** | 0 | 0 | 1 | 1 | 0 |
|  | I | 2:30 pm | **5** | 0 | 0 | 0 | 0 | 5 |
|  |  |  |  |  |  |  |  |  |
|  | II | 8:45 am | **10** | 1 | 3 | 0 | 0 | 6 |
|  | II | 10:45 am | **3** | 0 | 1 | 0 | 1 | 1 |
|  | II | 11:30 am | **2** | 0 | 0 | 0 | 1 | 1 |
|  | II | 1:00 pm | **9** | 2 | 3 | 1 | 1 | 2 |
|  | II | 2:30 pm | **7** | 3 | 2 | 0 | 0 | 2 |
|  |  |  |  |  |  |  |  |  |
|  | III | 8:50 am | **10** | 5 | 2 | 0 | 1 | 2 |
|  | III | 11:30 am | **5** | 3 | 2 | 0 | 0 | 0 |
|  | III | 1:00 pm | **9** | 3 | 0 | 0 | 0 | 1 |
|  |  |  |  |  |  |  |  |  |
|  | IV | 9:10 am | **14** | 3 | 2 | 2 | 6 | 1 |
|  | IV | 10:00 am | **11** | 3 | 3 | 1 | 1 | 3 |
|  | IV | 10:45 am | **8** | 3 | 1 | 1 | 3 | 0 |
|  | IV | 11:30 am | **7** | 1 | 2 | 0 | 2 | 2 |
|  | IV | 12:15 pm | **4** | 1 | 0 | 3 | 0 | 0 |
|  | IV | 1:00 pm | **10** | 8 | 1 | 0 | 0 | 1 |
|  | IV | 1:45 pm | **7** | 5 | 1 | 0 | 1 | 0 |
|  | IV | 2:30 pm | **4** | 0 | 2 | 0 | 0 | 2 |
|  | IV | 3:15 pm | **8** | 1 | 4 | 0 | 0 | 3 |
|  | IV | 4:00 pm | **9** | 3 | 3 | 0 | 0 | 3 |
|  |  |  |  |  |  |  |  |  |
|  | V | 8:00 am | **10** | 2 | 1 | 2 | 5 | 0 |
|  | V | 9:45 am | **33** | 14 | 2 | 0 | 0 | 11 |
|  | V | 10:45 am | **18** | 3 | 6 | 3 | 5 | 1 |
|  | V | 11:30 am | **17** | 9 | 2 | 2 | 3 | 1 |
|  | V | 12:15 pm | **14** | 6 | 5 | 1 | 2 | 0 |
|  | V | 1:00 pm | **16** | 4 | 2 | 3 | 7 | 0 |
|  | V | 1:45 pm | **9** | 5 | 3 | 0 | 1 | 0 |
|  | V | 2:30 pm | **17** | 8 | 6 | 0 | 0 | 3 |
|  |  |  |  |  |  |  |  |  |
|  | VI | 8:30 am | **16** | 3 | 7 | 0 | 4 | 2 |
|  | VI | 9:15 am | **8** | 2 | 0 | 0 | 0 | 6 |
|  | VI | 10:45 am | **7** | 1 | 3 | 2 | 1 | 0 |
|  | VI | 11:30 am | **18** | 5 | 2 | 2 | 6 | 3 |
|  | VI | 12:15 pm | **15** | 5 | 5 | 0 | 2 | 3 |
|  | VI | 1:00 pm | **9** | 2 | 7 | 0 | 0 | 0 |
|  | VI | 1:45 pm | **7** | 2 | 1 | 0 | 1 | 3 |
|  |  |  |  |  |  |  |  |  |
|  | VII | 1:00 pm | **13** | 4 | 2 | 1 | 2 | 4 |

Calculation for the percentage of crossveinless (cve) from generation, F4:

%cve = ncve/(ncve+nnon-cve), where n is the total number of flies (cve or non-cve)

= 222/(222+83) = 72.78%

**Table A.6:** **Upward selection line data from generation F5. Cve females collected 5 days a.p and males 6-7 days a.p**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time-points** |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **F5** | **Total** |  | **474** | **158** | **111** | **75** | **82** | **50** |
|  |  |  |  |  |  |  |  |  |
|  | I | 11:30 am | **3** | 2 | 1 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | II | 8:30 am | **17** | 11 | 5 | 0 | 1 | 0 |
|  | II | 9:15 am | **7** | 3 | 4 | 0 | 0 | 0 |
|  | II | 10:45 am | **16** | 4 | 2 | 5 | 4 | 1 |
|  | II | 11:30 am | **9** | 2 | 0 | 3 | 3 | 1 |
|  | II | 12:15 pm | **16** | 5 | 9 | 0 | 0 | 2 |
|  | II | 1:00 pm | **9** | 3 | 0 | 0 | 0 | 6 |
|  | II | 2:30 pm | **22** | 8 | 5 | 5 | 4 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | III | 9:45 am | **5** | 0 | 2 | 1 | 2 | 0 |
|  | III | 10:45 am | **4** | 1 | 3 | 0 | 0 | 0 |
|  | III | 12:15 pm | **6** | 3 | 3 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | IV | 9:15 am | **5** | 2 | 3 | 0 | 0 | 0 |
|  | IV | 10:00 am | **10** | 3 | 3 | 2 | 2 | 0 |
|  | IV | 10:45 am | **6** | 2 | 0 | 2 | 2 | 0 |
|  | IV | 11:30 am | **8** | 2 | 5 | 0 | 0 | 1 |
|  | IV | 12:15 pm | **4** | 0 | 0 | 1 | 3 | 0 |
|  | IV | 1:00 pm | **12** | 6 | 3 | 0 | 2 | 1 |
|  | IV | 1:45 pm | **6** | 1 | 1 | 2 | 1 | 1 |
|  |  |  |  |  |  |  |  |  |
|  | V | 8:30 am | **21** | 8 | 5 | 4 | 2 | 2 |
|  | V | 9:15 am | **15** | 4 | 6 | 2 | 3 | 0 |
|  | V | 10:00 am | **22** | 5 | 4 | 8 | 4 | 1 |
|  | V | 10:45 am | **14** | 4 | 0 | 7 | 3 | 0 |
|  | V | 11:30 am | **20** | 10 | 1 | 3 | 6 | 0 |
|  | V | 12:15 pm | **16** | 4 | 7 | 1 | 2 | 2 |
|  | V | 1:00 pm | **14** | 2 | 2 | 2 | 8 | 0 |
|  | V | 1:45 pm | **16** | 5 | 3 | 2 | 4 | 2 |
|  |  |  |  |  |  |  |  |  |
|  | VI | 8:30 am | **22** | 3 | 0 | 5 | 8 | 6 |
|  | VI | 9:15 am | **13** | 3 | 0 | 5 | 4 | 1 |
|  | VI | 10:00 am | **12** | 1 | 5 | 1 | 1 | 4 |
|  | VI | 10:45 am | **29** | 11 | 10 | 3 | 0 | 5 |
|  | VI | 11:30 am | **17** | 5 | 5 | 3 | 1 | 3 |
|  | VI | 12:15 pm | **16** | 6 | 5 | 3 | 2 | 3 |
|  | VI | 1:00 pm | **12** | 6 | 2 | 1 | 2 | 1 |
|  | VI | 1:45 pm | **23** | 9 | 6 | 3 | 2 | 3 |
|  |  |  |  |  |  |  |  |  |
|  | VII | 11:30 am | **10** | 7 | 0 | 0 | 3 | 0 |
|  | VII | 1:30 pm | **17** | 7 | 1 | 1 | 3 | 4 |

Calculation for the percentage of crossveinless (cve) from generation, F5:

%cve = ncve/(ncve+nnon-cve), where n is the total number of flies (cve or non-cve)

= 269/(269+157) = 63.14%

**Table A.7:** **Upward selection line data from generation F6. Cve females collected 5 days a.p and males 6-7 days a.p**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time-points** |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **F6** | **Total** |  | **359** | **131** | **105** | **27** | **46** | **46** |
|  |  |  |  |  |  |  |  |  |
|  | I | 8:30 am | **8** | 4 | 2 | 0 | 0 | 2 |
|  | I | 10:45 am | **5** | 2 | 2 | 1 | 0 | 0 |
|  | I | 12:15 pm | **5** | 0 | 2 | 0 | 0 | 3 |
|  | I | 1:00 pm | **2** | 0 | 0 | 2 | 0 | 0 |
|  | I | 2:45 pm | **2** | 0 | 1 | 0 | 0 | 1 |
|  |  |  |  |  |  |  |  |  |
|  | II | 8:30 am | **10** | 3 | 3 | 1 | 3 | 0 |
|  | II | 10:00 am | **7** | 0 | 2 | 1 | 4 | 0 |
|  | II | 10:45 am | **13** | 3 | 5 | 1 | 0 | 4 |
|  | II | 12:15 pm | **8** | 0 | 1 | 0 | 0 | 7 |
|  | II | 1:00 pm | **6** | 1 | 0 | 2 | 3 | 0 |
|  | II | 1:45 pm | **7** | 3 | 1 | 1 | 2 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | III | 2:30 pm | **13** | 5 | 3 | 1 | 2 | 2 |
|  | III | 3:15 pm | **12** | 0 | 3 | 2 | 6 | 1 |
|  | III | 4:00 pm | **10** | 4 | 2 | 0 | 0 | 4 |
|  |  |  |  |  |  |  |  |  |
|  | IV | 9:30 am | **25** | 5 | 10 | 2 | 5 | 3 |
|  | IV | 11:30 am | **18** | 6 | 7 | 1 | 2 | 1 |
|  | IV | 12:15 pm | **9** | 5 | 2 | 0 | 0 | 2 |
|  | IV | 1:00 pm | **8** | 2 | 0 | 2 | 4 | 0 |
|  | IV | 1:45 pm | **6** | 4 | 1 | 1 | 0 | 0 |
|  | IV | 2:15 pm | **18** | 11 | 6 | 0 | 0 | 1 |
|  | IV | 3:00 pm | **16** | 9 | 4 | 0 | 1 | 2 |
|  |  |  |  |  |  |  |  |  |
|  | V | 9:15 am | **12** | 6 | 4 | 0 | 2 | 0 |
|  | V | 11:30 am | **2** | 2 | 0 | 0 | 0 | 0 |
|  | V | 1:45 pm | **16** | 9 | 5 | 1 | 0 | 1 |
|  | V | 2:30 pm | **10** | 5 | 2 | 2 | 1 | 0 |
|  | V | 3:15 pm | **18** | 7 | 4 | 3 | 2 | 2 |
|  |  |  |  |  |  |  |  |  |
|  | VI | 9:15 am | **16** | 6 | 9 | 0 | 0 | 1 |
|  | VI | 10:45 am | **13** | 5 | 6 | 0 | 1 | 1 |
|  | VI | 11:30 am | **13** | 6 | 2 | 2 | 3 | 0 |
|  | VI | 12:15 pm | **12** | 3 | 3 | 0 | 0 | 6 |
|  | VI | 1:45 pm | **23** | 8 | 8 | 0 | 3 | 1 |
|  | VI | 2:30 pm | **16** | 7 | 5 | 1 | 2 | 1 |

Calculation for the percentage of crossveinless (cve) from generation, F6:

%cve = ncve/(ncve+nnon-cve), where n is the total number of flies (cve or non-cve)

= 236/(236+73) = 76.37%

**Table A.8:** **Upward selection line data from generation F7. Cve females collected 5 days a.p and males 6-7 days a.p**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae**  **collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time-points** |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **F7** | **Total** |  | **182** | **87** | **52** | **9** | **7** | **25** |
|  |  |  |  |  |  |  |  |  |
|  | I | 8:30 am | **9** | 7 | 2 | 0 | 0 | 0 |
|  | I | 9:15 am | **9** | 7 | 2 | 0 | 0 | 0 |
|  | I | 11:30 am | **18** | 11 | 4 | 0 | 0 | 2 |
|  | I | 12:15 pm | **10** | 2 | 2 | 0 | 0 | 6 |
|  | I | 1:00 pm | **4** | 1 | 3 | 0 | 0 | 0 |
|  | I | 1:45 pm | **8** | 4 | 2 | 0 | 0 | 2 |
|  | I | 2:30 pm | **17** | 9 | 5 | 0 | 0 | 3 |
|  |  |  |  |  |  |  |  |  |
|  | II | 8:30 am | **12** | 7 | 3 | 0 | 1 | 1 |
|  | II | 9:15 am | **3** | 1 | 2 | 0 | 0 | 0 |
|  | II | 10:00 am | **19** | 9 | 5 | 2 | 2 | 1 |
|  | II | 10:45 am | **16** | 8 | 4 | 2 | 1 | 1 |
|  | II | 11:30 am | **18** | 3 | 7 | 4 | 3 | 1 |
|  | II | 1:00 pm | **15** | 6 | 5 | 0 | 0 | 3 |
|  | II | 1:45 pm | **8** | 1 | 4 | 0 | 0 | 3 |
|  |  |  |  |  |  |  |  |  |
|  | III | 11:30 am | **8** | 7 | 1 | 0 | 0 | 0 |
|  | III | 1:45 pm | **8** | 4 | 1 | 1 | 0 | 2 |

Calculation for the percentage of crossveinless (cve) from generation, F7:

%cve = ncve/(ncve+nnon-cve), where n is the total number of flies (cve or non-cve)

= 139/(139+16) = 89.67%

**Table A.9:** **Upward selection line data from generation F8. Cve females collected 5 days a.p and males 6-7 days a.p**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae**  **collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time-points** |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **F8** | **Total** |  | **184** | **68** | **46** | **2** | **5** | **53** |
|  |  |  |  |  |  |  |  |  |
|  | I | 9:15 am | 6 | 1 | 1 | 0 | 1 | 3 |
|  | I | 10:00 am | 5 | 1 | 1 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | II | 10:00 am | 6 | 1 | 0 | 0 | 0 | 0 |
|  | II | 10:45 am | 11 | 0 | 0 | 0 | 0 | 11 |
|  | II | 11:15 am | 7 | 0 | 0 | 0 | 0 | 7 |
|  | II | 12:45 pm | 4 | 3 | 0 | 0 | 0 | 0 |
|  | II | 1:30 pm | 12 | 5 | 4 | 0 | 1 | 2 |
|  | II | 2:30 pm | 8 | 4 | 4 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | III | 9:15 am | 9 | 1 | 2 | 0 | 0 | 6 |
|  | III | 10:00 am | 3 | 2 | 0 | 0 | 0 | 1 |
|  | III | 10:45 am | 8 | 0 | 4 | 0 | 0 | 4 |
|  | III | 11:30 am | 12 | 7 | 1 | 0 | 0 | 4 |
|  | III | 1:00 pm | 7 | 2 | 2 | 0 | 0 | 3 |
|  |  |  |  |  |  |  |  |  |
|  | IV | 9:15 am | 3 | 0 | 2 | 0 | 0 | 1 |
|  | IV | 10:45 am | 9 | 3 | 6 | 0 | 0 | 0 |
|  | IV | 11:30 am | 4 | 1 | 1 | 1 | 1 | 0 |
|  | IV | 1:00 pm | 4 | 4 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | V | 9:00 am | 6 | 2 | 1 | 0 | 0 | 3 |
|  | V | 10:45 am | 10 | 5 | 1 | 0 | 1 | 3 |
|  | V | 11:30 am | 13 | 5 | 4 | 1 | 0 | 3 |
|  | V | 1:00 pm | 17 | 9 | 7 | 0 | 1 | 0 |
|  | V | 1:45 pm | 9 | 6 | 2 | 0 | 0 | 1 |
|  | V | 2:30 pm | 10 | 6 | 3 | 0 | 0 | 1 |

Calculation for the percentage of crossveinless (cve) from generation, F8:

%cve = ncve/(ncve+nnon-cve), where n is the total number of flies (cve or non-cve)

= 114/(114+7) = 94.21%

**Table A.10:** **Upward selection line data from generation F9. Cve females collected 5 days a.p and males 6-7 days a.p**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae**  **collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time-points** |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **F9** | **Total** |  | **187** | **73** | **38** | **1** | **4** | **71** |
|  |  |  |  |  |  |  |  |  |
|  | I | 8:30 am | **9** | 6 | 3 | 0 | 0 | 0 |
|  | I | 9:15 am | **12** | 3 | 1 | 0 | 0 | 0 |
|  | I | 10:00 am | **8** | 5 | 2 | 0 | 0 | 1 |
|  | I | 10:45 am | **17** | 6 | 3 | 0 | 0 | 8 |
|  | I | 11:30 am | **5** | 1 | 1 | 0 | 0 | 3 |
|  | I | 12:15 pm | **13** | 9 | 3 | 0 | 1 | 0 |
|  | I | 1:00 pm | **4** | 2 | 2 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | II | 8:30 am | **6** | 3 | 1 | 1 | 0 | 1 |
|  | II | 9:15 am | **8** | 2 | 4 | 0 | 0 | 2 |
|  | II | 11:30 am | **11** | 4 | 2 | 0 | 0 | 5 |
|  | II | 1:45 pm | **7** | 3 | 3 | 0 | 0 | 1 |
|  | II | 3:15 pm | **15** | 4 | 1 | 0 | 1 | 9 |
|  |  |  |  |  |  |  |  |  |
|  | III | 8:30 am | **10** | 2 | 2 | 0 | 1 | 5 |
|  | III | 10:00 am | **6** | 4 | 1 | 0 | 0 | 1 |
|  | III | 11:30 am | **4** | 1 | 2 | 0 | 0 | 1 |
|  | III | 1:00 pm | **8** | 4 | 0 | 0 | 0 | 4 |
|  | III | 1:45 pm | **11** | 4 | 5 | 0 | 1 | 1 |
|  | III | 2:30 pm | **3** | 1 | 0 | 0 | 0 | 2 |
|  |  |  |  |  |  |  |  |  |
|  | IV | 9:00 am | **11** | 5 | 1 | 0 | 0 | 5 |
|  | IV | 10:45 am | **9** | 2 | 0 | 0 | 0 | 7 |
|  | IV | 11:30 am | **7** | 0 | 0 | 0 | 0 | 7 |
|  | IV | 1:00 pm | **3** | 2 | 1 | 0 | 0 | 0 |

Calculation for the percentage of crossveinless (cve) from generation, F9:

%cve = ncve/(ncve+nnon-cve), where n is the total number of flies (cve or non-cve)

= 111/(111+5) = 95.68%

**Table A.11:** **Upward selection line data from generation F10. Cve females collected 5 days a.p and males 6-7 days a.p**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae**  **collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time-points** |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **F10** | **Total** |  | **184** | **72** | **45** | **2** | **5** | **45** |
|  |  |  |  |  |  |  |  |  |
|  | I | 8:30 am | **8** | 4 | 2 | 0 | 0 | 2 |
|  | I | 10:45 am | **5** | 2 | 2 | 0 | 0 | 1 |
|  | I | 12:15 pm | **10** | 3 | 3 | 0 | 0 | 4 |
|  | I | 1:00 pm | **2** | 0 | 0 | 0 | 1 | 1 |
|  | I | 2:45 pm | **3** | 2 | 1 | 0 | 0 | 1 |
|  |  |  |  |  |  |  |  | 0 |
|  | II | 8:30 am | **5** | 0 | 2 | 0 | 0 | 3 |
|  | II | 10:00 am | **13** | 5 | 1 | 0 | 2 | 5 |
|  | II | 10:45 am | **13** | 3 | 0 | 0 | 0 | 0 |
|  | II | 12:15 pm | **8** | 0 | 0 | 0 | 0 | 8 |
|  | II | 1:00 pm | **6** | 1 | 0 | 0 | 0 | 0 |
|  | II | 1:45 pm | **7** | 3 | 1 | 0 | 0 | 3 |
|  |  |  |  |  |  |  |  |  |
|  | III | 2:30 pm | **7** | 2 | 0 | 0 | 0 | 5 |
|  | III | 3:15 pm | **12** | 0 | 3 | 1 | 2 | 6 |
|  | III | 4:00 pm | **10** | 5 | 2 | 0 | 0 | 3 |
|  |  |  |  |  |  |  |  |  |
|  | IV | 9:30 am | **5** | 1 | 4 | 0 | 0 | 0 |
|  | IV | 11:30 am | **16** | 8 | 7 | 1 | 0 | 0 |
|  | IV | 12:15 pm | **9** | 5 | 2 | 0 | 0 | 2 |
|  | IV | 1:00 pm | **4** | 3 | 1 | 0 | 0 | 0 |
|  | IV | 1:45 pm | **6** | 5 | 1 | 0 | 0 | 0 |
|  | IV | 2:15 pm | **18** | 11 | 7 | 0 | 0 | 0 |
|  | IV | 3:00 pm | **16** | 9 | 6 | 0 | 0 | 1 |

Calculation for the percentage of crossveinless (cve) from generation, F10:

%cve = ncve/(ncve+nnon-cve), where n is the total number of flies (cve or non-cve)

= 117/(117+7) = 94.35%

**Table A.12:** **Downward selection line data from generation F3**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time-points** |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **F3** | **Total** |  | **344** | **69** | **47** | **79** | **92** | **57** |
|  |  |  |  |  |  |  |  |  |
|  | I | 9:15 am | **11** | 1 | 1 | 3 | 5 | 1 |
|  | I | 10:00 am | **15** | 1 | 1 | 6 | 7 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | II | 10:00 am | **26** | 1 | 0 | 7 | 12 | 6 |
|  | II | 10:45 am | **11** | 0 | 1 | 0 | 0 | 10 |
|  | II | 11:15 am | **8** | 1 | 0 | 0 | 0 | 7 |
|  | II | 12:45 pm | **14** | 3 | 0 | 6 | 4 | 1 |
|  | II | 1:30 pm | **12** | 5 | 4 | 0 | 1 | 2 |
|  | II | 2:30 pm | **19** | 4 | 4 | 8 | 3 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | III | 9:15 am | **13** | 1 | 2 | 2 | 2 | 6 |
|  | III | 10:00 am | **23** | 2 | 0 | 8 | 12 | 1 |
|  | III | 10:45 am | **8** | 0 | 4 | 0 | 0 | 4 |
|  | III | 11:30 am | **12** | 7 | 1 | 0 | 0 | 4 |
|  | III | 1:00 pm | **17** | 2 | 2 | 8 | 2 | 3 |
|  |  |  |  |  |  |  |  |  |
|  | IV | 9:15 am | **8** | 0 | 2 | 1 | 4 | 1 |
|  | IV | 10:45 am | **11** | 3 | 6 | 1 | 1 | 0 |
|  | IV | 11:30 am | **19** | 1 | 1 | 9 | 8 | 0 |
|  | IV | 1:00 pm | **23** | 4 | 0 | 6 | 13 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | V | 9:00 am | **16** | 2 | 1 | 1 | 9 | 3 |
|  | V | 10:45 am | **11** | 5 | 1 | 1 | 1 | 3 |
|  | V | 11:30 am | **28** | 5 | 4 | 9 | 7 | 3 |
|  | V | 1:00 pm | **17** | 9 | 7 | 0 | 1 | 0 |
|  | V | 1:45 pm | **12** | 6 | 2 | 3 | 0 | 1 |
|  | V | 2:30 pm | **10** | 6 | 3 | 0 | 0 | 1 |

Calculation for the percentage of crossveinless (cve) from generation, F3:

%cve = ncve/(ncve+nnon-cve),

= 116/(116+171) = 40.41%

**Table A.13:** **Downward selection line data from generation F4**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae**  **collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time-points** |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **F4** | **Total** |  | **300** | **51** | **37** | **65** | **95** | **52** |
|  | I | 8:30 am | **5** | 0 | 0 | 2 | 3 | 0 |
|  | I | 9:15 am | **2** | 1 | 0 | 0 | 0 | 1 |
|  | I | 10:00 am | **3** | 0 | 0 | 1 | 2 | 0 |
|  | I | 10:45 am | **5** | 3 | 1 | 0 | 1 | 0 |
|  | I | 11:30 am | **2** | 0 | 0 | 0 | 0 | 2 |
|  | I | 12:15 pm | **6** | 0 | 0 | 1 | 5 | 0 |
|  | I | 1:00 pm | **2** | 0 | 0 | 1 | 1 | 0 |
|  | I | 2:30 pm | **5** | 0 | 0 | 2 | 2 | 1 |
|  |  |  |  |  |  |  |  |  |
|  | II | 8:45 am | **13** | 6 | 1 | 3 | 3 | 0 |
|  | II | 10:45 am | **3** | 0 | 1 | 0 | 1 | 1 |
|  | II | 11:30 am | **6** | 4 | 1 | 0 | 0 | 1 |
|  | II | 1:00 pm | **9** | 0 | 0 | 2 | 6 | 1 |
|  | II | 2:30 pm | **17** | 8 | 2 | 2 | 3 | 2 |
|  |  |  |  |  |  |  |  |  |
|  | III | 8:50 am | **10** | 1 | 0 | 2 | 5 | 2 |
|  | III | 11:30 am | **5** | 3 | 2 | 0 | 0 | 0 |
|  | III | 1:00 pm | **9** | 3 | 0 | 4 | 1 | 1 |
|  |  |  |  |  |  |  |  |  |
|  | IV | 9:10 am | **6** | 0 | 0 | 1 | 4 | 1 |
|  | IV | 10:00 am | **6** | 0 | 0 | 0 | 1 | 5 |
|  | IV | 10:45 am | **8** | 0 | 1 | 4 | 3 | 0 |
|  | IV | 11:30 am | **7** | 0 | 0 | 3 | 2 | 2 |
|  | IV | 12:15 pm | **4** | 0 | 0 | 3 | 1 | 0 |
|  | IV | 1:00 pm | **10** | 3 | 1 | 1 | 4 | 1 |
|  | IV | 1:45 pm | **7** | 0 | 0 | 5 | 2 | 0 |
|  | IV | 2:30 pm | **4** | 0 | 0 | 2 | 0 | 2 |
|  | IV | 3:15 pm | **8** | 0 | 0 | 5 | 0 | 3 |
|  | IV | 4:00 pm | **9** | 0 | 0 | 1 | 5 | 3 |
|  |  |  |  |  |  |  |  |  |
|  | V | 8:00 am | **10** | 2 | 0 | 2 | 5 | 1 |
|  | V | 9:45 am | **9** | 1 | 2 | 1 | 2 | 3 |
|  | V | 10:45 am | **7** | 0 | 0 | 1 | 5 | 1 |
|  | V | 11:30 am | **11** | 0 | 2 | 4 | 5 | 0 |
|  | V | 12:15 pm | **3** | 0 | 0 | 1 | 2 | 0 |
|  | V | 1:00 pm | **8** | 0 | 4 | 1 | 3 | 0 |
|  | V | 1:45 pm | **4** | 0 | 3 | 0 | 1 | 0 |
|  | V | 2:30 pm | **12** | 2 | 4 | 3 | 0 | 3 |
|  |  |  |  |  |  |  |  |  |
|  | VI | 8:30 am | **16** | 6 | 3 | 0 | 4 | 3 |
|  | VI | 9:15 am | **13** | 0 | 0 | 1 | 9 | 3 |
|  | VI | 10:45 am | **7** | 3 | 1 | 2 | 1 | 0 |
|  | VI | 11:30 am | **8** | 0 | 0 | 4 | 1 | 3 |
|  | VI | 12:15 pm | **5** | 0 | 0 | 0 | 2 | 3 |
|  | VI | 1:00 pm | **9** | 2 | 7 | 0 | 0 | 0 |
|  | VI | 1:45 pm | **7** | 3 | 1 | 0 | 0 | 3 |

Calculation for the percentage of crossveinless (cve) from generation, F4:

%cve = ncve/(ncve+nnon-cve),

= 88/(88+160) = 35.48%

**Table A.14:** **Downward selection line data from generation F5**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time-points** |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **F5** | **Total** |  | **447** | **97** | **63** | **112** | **136** | **39** |
|  |  |  |  |  |  |  |  |  |
|  | I | 11:30 am | **11** | 2 | 1 | 3 | 5 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | II | 8:30 am | **18** | 9 | 1 | 4 | 0 | 4 |
|  | II | 9:15 am | **5** | 1 | 2 | 1 | 1 | 0 |
|  | II | 10:45 am | **16** | 3 | 3 | 5 | 4 | 1 |
|  | II | 11:30 am | **6** | 0 | 0 | 3 | 3 | 0 |
|  | II | 12:15 pm | **16** | 0 | 0 | 5 | 9 | 2 |
|  | II | 1:00 pm | **9** | 0 | 0 | 0 | 3 | 6 |
|  | II | 2:30 pm | **22** | 5 | 4 | 6 | 5 | 2 |
|  |  |  |  |  |  |  |  |  |
|  | III | 9:45 am | **8** | 0 | 2 | 1 | 5 | 0 |
|  | III | 10:45 am | **6** | 1 | 3 | 0 | 2 | 0 |
|  | III | 12:15 pm | **7** | 0 | 0 | 3 | 4 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | IV | 9:15 am | **5** | 0 | 0 | 1 | 4 | 0 |
|  | IV | 10:00 am | **11** | 5 | 3 | 3 | 0 | 0 |
|  | IV | 10:45 am | **6** | 2 | 0 | 2 | 2 | 0 |
|  | IV | 11:30 am | **8** | 2 | 5 | 0 | 0 | 1 |
|  | IV | 12:15 pm | **6** | 0 | 0 | 3 | 3 | 0 |
|  | IV | 1:00 pm | **12** | 2 | 0 | 5 | 4 | 1 |
|  | IV | 1:45 pm | **7** | 1 | 0 | 2 | 2 | 2 |
|  |  |  |  |  |  |  |  |  |
|  | V | 8:30 am | **22** | 8 | 2 | 4 | 6 | 2 |
|  | V | 9:15 am | **15** | 3 | 2 | 5 | 5 | 0 |
|  | V | 10:00 am | **21** | 12 | 4 | 2 | 3 | 0 |
|  | V | 10:45 am | **14** | 2 | 2 | 8 | 2 | 0 |
|  | V | 11:30 am | **19** | 10 | 1 | 3 | 5 | 0 |
|  | V | 12:15 pm | **16** | 4 | 7 | 1 | 2 | 2 |
|  | V | 1:00 pm | **14** | 1 | 2 | 3 | 8 | 0 |
|  | V | 1:45 pm | **17** | 5 | 4 | 3 | 3 | 2 |
|  |  |  |  |  |  |  |  |  |
|  | VI | 8:30 am | **22** | 1 | 2 | 8 | 5 | 6 |
|  | VI | 9:15 am | **13** | 3 | 1 | 6 | 2 | 1 |
|  | VI | 10:00 am | **12** | 1 | 5 | 1 | 1 | 4 |
|  | VI | 10:45 am | **24** | 9 | 0 | 5 | 10 | 0 |
|  | VI | 11:30 am | **17** | 2 | 2 | 7 | 6 | 0 |
|  | VI | 12:15 pm | **16** | 1 | 3 | 5 | 7 | 0 |
|  | VI | 1:00 pm | **12** | 2 | 2 | 1 | 6 | 1 |
|  | VI | 1:45 pm | **14** | 0 | 0 | 3 | 9 | 2 |

Calculation for the percentage of crossveinless (cve) from generation, F5:

%cve = ncve/(ncve+nnon-cve),

= 160/(160+248) = 39.21%

**Table A.15:** **Downward selection line data from generation F6**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time-points** |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **F6** | **Total** |  | **376** | **49** | **43** | **114** | **144** | **26** |
|  |  |  |  |  |  |  |  |  |
|  | I | 8:30 am | **7** | 0 | 0 | 3 | 4 | 0 |
|  | I | 10:45 am | **5** | 2 | 2 | 1 | 0 | 0 |
|  | I | 12:15 pm | **3** | 0 | 2 | 0 | 0 | 1 |
|  | I | 1:00 pm | **6** | 0 | 0 | 2 | 4 | 0 |
|  | I | 2:45 pm | **8** | 0 | 1 | 7 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | II | 8:30 am | **3** | 0 | 0 | 1 | 2 | 0 |
|  | II | 10:00 am | **5** | 0 | 0 | 1 | 4 | 0 |
|  | II | 10:45 am | **13** | 2 | 1 | 1 | 9 | 0 |
|  | II | 12:15 pm | **8** | 1 | 1 | 1 | 2 | 3 |
|  | II | 1:00 pm | **6** | 0 | 0 | 3 | 3 | 0 |
|  | II | 1:45 pm | **17** | 3 | 1 | 5 | 8 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | III | 2:30 pm | **22** | 1 | 2 | 6 | 9 | 4 |
|  | III | 3:15 pm | **12** | 0 | 1 | 3 | 7 | 1 |
|  | III | 4:00 pm | **10** | 0 | 0 | 2 | 4 | 4 |
|  |  |  |  |  |  |  |  |  |
|  | IV | 9:30 am | **25** | 1 | 4 | 6 | 11 | 3 |
|  | IV | 11:30 am | **18** | 1 | 1 | 7 | 8 | 1 |
|  | IV | 12:15 pm | **9** | 0 | 0 | 4 | 3 | 2 |
|  | IV | 1:00 pm | **6** | 1 | 0 | 2 | 3 | 0 |
|  | IV | 1:45 pm | **6** | 0 | 0 | 1 | 5 | 0 |
|  | IV | 2:15 pm | **18** | 3 | 1 | 0 | 13 | 1 |
|  | IV | 3:00 pm | **16** | 9 | 4 | 0 | 1 | 2 |
|  |  |  |  |  |  |  |  |  |
|  | V | 9:15 am | **14** | 4 | 2 | 4 | 4 | 0 |
|  | V | 11:30 am | **21** | 2 | 0 | 8 | 11 | 0 |
|  | V | 1:45 pm | **16** | 3 | 5 | 4 | 3 | 1 |
|  | V | 2:30 pm | **11** | 1 | 2 | 5 | 3 | 0 |
|  | V | 3:15 pm | **18** | 5 | 4 | 7 | 2 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | VI | 9:15 am | **5** | 1 | 1 | 0 | 2 | 1 |
|  | VI | 10:45 am | **7** | 0 | 0 | 5 | 1 | 1 |
|  | VI | 11:30 am | **5** | 0 | 2 | 0 | 3 | 0 |
|  | VI | 12:15 pm | **12** | 2 | 1 | 6 | 3 | 0 |
|  | VI | 1:45 pm | **19** | 0 | 0 | 11 | 7 | 1 |
|  | VI | 2:30 pm | **25** | 7 | 5 | 8 | 5 | 0 |

Calculation for the percentage of crossveinless (cve) from generation, F6:

%cve = ncve/(ncve+nnon-cve),

= 92/(92+258) = 26.28%

**Table A.16:** **Downward selection line data from generation F7**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time Points** |  | **cve female** | **cve male** | **non-cve female** | **non-cve male** |  |
| **F7** | **Total** |  | **238** | **13** | **6** | **47** | **43** | **129** |
|  |  |  |  |  |  |  |  |  |
|  | I | 4:00 pm | **2** | 0 | 0 | 1 | 1 | 0 |
|  | I | 4:45 pm | **3** | 0 | 0 | 2 | 1 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | II | 9:15 am | **9** | 1 | 1 | 2 | 5 | 0 |
|  | II | 10:00 am | **6** | 0 | 0 | 5 | 1 | 0 |
|  | II | 10:45 am | **10** | 2 | 0 | 2 | 6 | 0 |
|  | II | 11:30 am | **9** | 1 | 0 | 3 | 3 | 2 |
|  | II | 12:15 pm | **4** | 0 | 0 | 2 | 2 | 0 |
|  | II | 1:00 pm | **11** | 1 | 0 | 3 | 7 | 0 |
|  | II | 1:45 pm | **4** | 1 | 2 | 0 | 0 | 1 |
|  | II | 2:30 pm | **8** | 0 | 0 | 6 | 2 | 0 |
|  | II | 3:15 pm | **6** | 1 | 0 | 4 | 1 | 0 |
|  | II | 4:00 pm | **3** | 0 | 0 | 1 | 2 | 0 |
|  | II | 4:45 pm | **4** | 1 | 0 | 0 | 1 | 2 |
|  | II | 5:30 pm | **5** | 0 | 0 | 4 | 1 | 0 |
|  | II | 6:15 pm | **6** | 1 | 0 | 2 | 3 | 0 |
|  | II | 7:00 pm | **5** | 0 | 0 | 1 | 3 | 1 |
|  |  |  |  |  |  |  |  |  |
|  | III | 9:15 am | **4** | 0 | 0 | 2 | 2 | 0 |
|  | III | 10:00 am | **6** | 0 | 0 | 0 | 0 | 6 |
|  | III | 10:45 am | **6** | 0 | 0 | 0 | 0 | 6 |
|  | III | 11:30 am | **8** | 0 | 0 | 0 | 0 | 8 |
|  | III | 12:15 pm | **4** | 1 | 0 | 0 | 0 | 3 |
|  | III | 1:00 pm | **5** | 0 | 0 | 0 | 0 | 5 |
|  | III | 1:45 pm | **6** | 0 | 0 | 0 | 0 | 6 |
|  | III | 2:30 pm | **10** | 0 | 0 | 0 | 0 | 10 |
|  | III | 3:15 pm | **3** | 0 | 0 | 0 | 0 | 3 |
|  | III | 4:00 pm | **3** | 0 | 0 | 0 | 0 | 3 |
|  | III | 4:45 pm | **5** | 0 | 0 | 0 | 0 | 5 |
|  | III | 5:30 pm | **4** | 0 | 0 | 0 | 0 | 4 |
|  | III | 6:15 pm | **7** | 0 | 0 | 0 | 0 | 7 |
|  |  |  |  |  |  |  |  |  |
|  | IV | 9:15 am | **9** | 2 | 2 | 3 | 2 | 0 |
|  | IV | 10:00 am | **6** | 0 | 0 | 0 | 0 | 6 |
|  | IV | 10:45 am | **5** | 0 | 0 | 0 | 0 | 5 |
|  | IV | 11:30 am | **8** | 0 | 0 | 0 | 0 | 8 |
|  | IV | 12:15 am | **5** | 0 | 0 | 0 | 0 | 5 |
|  | IV | 1:00 pm | **6** | 0 | 0 | 0 | 0 | 6 |
|  | IV | 1:45 pm | **11** | 0 | 1 | 0 | 0 | 10 |
|  | IV | 2:30 pm | **5** | 0 | 0 | 0 | 0 | 5 |
|  | IV | 3:15 pm | **3** | 0 | 0 | 0 | 0 | 3 |
|  | IV | 4:00 pm | **3** | 1 | 0 | 2 | 0 | 0 |
|  | IV | 4:45 pm | **5** | 0 | 0 | 0 | 0 | 5 |
|  | IV | 5:30 pm | **3** | 0 | 0 | 1 | 0 | 2 |
|  | IV | 6:15 pm | **3** | 0 | 0 | 1 | 0 | 2 |

Calculation for the percentage of crossveinless (cve) from generation, F7:

%cve = ncve/(ncve+nnon-cve),

= 19/(19+90) = 17.43%

**Table A.17:** **Downward selection line data from generation F8**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time Points** |  | **cve female** | **cve male** | **non-cve female** | **non-cve male** |  |
| **F8** | **Total** |  | **169** | **7** | **5** | **52** | **57** | **48** |
|  |  |  |  |  |  |  |  |  |
|  | I | 9:15 am | **0** | **0** | **0** | **0** | **0** | **0** |
|  | I | 10:00 am | **4** | **1** | **0** | **0** | **0** | **3** |
|  | I | 12:15 pm | **3** | **0** | **0** | **0** | **0** | **3** |
|  | I | 1:00 pm | **0** | **0** | **0** | **0** | **0** | **0** |
|  | I | 1:45 pm | **6** | **0** | **1** | **2** | **3** | **0** |
|  | I | 2:30 pm | **3** | **0** | **0** | **1** | **1** | **1** |
|  | I | 3:15 pm | **3** | **0** | **0** | **0** | **0** | **3** |
|  | I | 4:00 pm | **3** | **1** | **0** | **0** | **0** | **2** |
|  | I | 4:45 pm | **4** | **0** | **0** | **0** | **0** | **4** |
|  |  |  |  |  |  |  |  |  |
|  | II | 7:45 am | **7** | **0** | **0** | **3** | **2** | **2** |
|  | II | 8:30 am | **4** | **0** | **0** | **2** | **2** | **0** |
|  | II | 9:15 am | **3** | **0** | **0** | **2** | **1** | **0** |
|  | II | 10:00 am | **3** | **0** | **0** | **1** | **2** | **0** |
|  | II | 10:45 am | **10** | **0** | **0** | **5** | **3** | **2** |
|  | II | 11:30 am | **6** | **1** | **0** | **2** | **1** | **2** |
|  | II | 12:15 pm | **3** | **1** | **0** | **0** | **0** | **2** |
|  | II | 1:00 pm | **6** | **0** | **0** | **2** | **4** | **0** |
|  | II | 1:45 pm | **8** | **0** | **0** | **2** | **6** | **0** |
|  | II | 2:30 pm | **0** | **0** | **0** | **0** | **0** | **0** |
|  | II | 3:15 pm | **8** | **1** | **1** | **1** | **2** | **3** |
|  | II | 4:00 pm | **0** | **0** | **0** | **0** | **0** | **0** |
|  | II | 4:45 pm | **7** | **0** | **0** | **1** | **4** | **2** |
|  | II | 5:30 pm | **5** | **0** | **0** | **3** | **2** | **0** |
|  | II | 6:15 pm | **0** | **0** | **0** | **0** | **0** | **0** |
|  |  |  |  |  |  |  |  |  |
|  | III | 7:45 am | **10** | **0** | **0** | **3** | **6** | **1** |
|  | III | 8:30 am | **8** | **0** | **3** | **2** | **2** | **1** |
|  | III | 9:15 am | **5** | **0** | **0** | **4** | **1** | **0** |
|  | III | 10:00 am | **0** | **0** | **0** | **0** | **0** | **0** |
|  | III | 10:45 am | **7** | **0** | **0** | **3** | **2** | **2** |
|  | III | 11:30 am | **2** | **0** | **0** | **2** | **0** | **0** |
|  | III | 12:15 am | **8** | **0** | **0** | **0** | **0** | **8** |
|  | III | 1:00 pm | **4** | **0** | **0** | **1** | **3** | **0** |
|  | III | 1:45 pm | **7** | **1** | **0** | **0** | **0** | **6** |
|  | III | 2:30 pm | **5** | **0** | **0** | **1** | **4** | **0** |
|  | III | 3:15 pm | **7** | **0** | **0** | **3** | **3** | **1** |
|  | III | 4:00 pm | **10** | **1** | **0** | **6** | **3** | **0** |

Calculation for the percentage of crossveinless (cve) from generation, F8:

%cve = ncve/(ncve+nnon-cve),

= 12/(12+109) = 9.91%

**Table A.18:** **Downward selection line data from generation F9**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae**  **collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time-points** |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **F9** | **Total** |  | **178** | **8** | **6** | **46** | **87** | **31** |
|  |  |  |  |  |  |  |  |  |
|  | I | 8:30 am | **2** | 0 | 0 | 0 | 0 | 2 |
|  | I | 9:15 am | **9** | 0 | 0 | 0 | 8 | 1 |
|  | I | 10:00 am | **8** | 0 | 0 | 1 | 6 | 1 |
|  | I | 10:45 am | **18** | 1 | 1 | 5 | 11 | 0 |
|  | I | 11:30 am | **5** | 1 | 1 | 0 | 0 | 3 |
|  | I | 12:15 pm | **13** | 0 | 0 | 9 | 4 | 0 |
|  | I | 1:00 pm | **4** | 1 | 2 | 0 | 1 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | II | 8:30 am | **8** | 1 | 0 | 1 | 6 | 0 |
|  | II | 9:15 am | **8** | 0 | 0 | 4 | 2 | 2 |
|  | II | 11:30 am | **10** | 1 | 0 | 1 | 8 | 0 |
|  | II | 1:45 pm | **7** | 0 | 0 | 3 | 2 | 2 |
|  | II | 3:15 pm | **12** | 0 | 0 | 4 | 8 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | III | 8:30 am | **8** | 0 | 0 | 2 | 5 | 1 |
|  | III | 10:00 am | **6** | 0 | 0 | 2 | 3 | 1 |
|  | III | 11:30 am | **4** | 1 | 0 | 1 | 1 | 1 |
|  | III | 1:00 pm | **8** | 0 | 0 | 4 | 4 | 0 |
|  | III | 1:45 pm | **11** | 0 | 1 | 4 | 5 | 1 |
|  | III | 2:30 pm | **3** | 0 | 0 | 1 | 2 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | IV | 9:00 am | **13** | 2 | 1 | 3 | 5 | 2 |
|  | IV | 10:45 am | **9** | 0 | 0 | 0 | 2 | 7 |
|  | IV | 11:30 am | **7** | 0 | 0 | 0 | 0 | 7 |
|  | IV | 1:00 pm | **5** | 0 | 0 | 1 | 4 | 0 |

Calculation for the percentage of crossveinless (cve) from generation, F9:

%cve = ncve/(ncve+nnon-cve),

= 14/(14+133) = 9.52%

**Table A.19:** **Downward selection line data from generation F10**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gen.** |  |  | **Pupae**  **collected** | **Eclosed** |  |  |  | **Died** |
|  | **Days** | **Time-points** |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **F10** | **Total** |  | **204** | **14** | **9** | **65** | **90** | **26** |
|  |  |  |  |  |  |  |  |  |
|  | I | 8:30 am | **11** | 1 | 1 | 3 | 5 | 1 |
|  | I | 10:45 am | **3** | 0 | 0 | 0 | 2 | 1 |
|  | I | 12:15 pm | **13** | 0 | 0 | 4 | 5 | 4 |
|  | I | 1:00 pm | **3** | 0 | 0 | 2 | 1 | 0 |
|  | I | 2:45 pm | **7** | 0 | 0 | 3 | 3 | 1 |
|  |  |  |  |  |  |  |  |  |
|  | II | 8:30 am | **4** | 2 | 0 | 1 | 1 | 0 |
|  | II | 10:00 am | **17** | 0 | 1 | 5 | 10 | 1 |
|  | II | 10:45 am | **10** | 0 | 0 | 0 | 2 | 8 |
|  | II | 12:15 pm | **9** | 6 | 0 | 1 | 0 | 2 |
|  | II | 1:00 pm | **6** | 1 | 0 | 0 | 5 | 0 |
|  | II | 1:45 pm | **3** | 0 | 0 | 1 | 2 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | III | 2:30 pm | **9** | 0 | 0 | 2 | 5 | 2 |
|  | III | 3:15 pm | **15** | 2 | 1 | 5 | 6 | 1 |
|  | III | 4:00 pm | **8** | 0 | 0 | 3 | 5 | 0 |
|  |  |  |  |  |  |  |  |  |
|  | IV | 9:30 am | **7** | 0 | 0 | 3 | 4 | 0 |
|  | IV | 11:30 am | **18** | 1 | 1 | 9 | 7 | 0 |
|  | IV | 12:15 pm | **8** | 1 | 2 | 3 | 0 | 2 |
|  | IV | 1:00 pm | **12** | 0 | 2 | 2 | 8 | 0 |
|  | IV | 1:45 pm | **8** | 0 | 0 | 1 | 5 | 2 |
|  | IV | 2:15 pm | **14** | 0 | 0 | 8 | 6 | 0 |
|  | IV | 3:00 pm | **19** | 0 | 1 | 9 | 8 | 1 |

Calculation for the percentage of crossveinless (cve) from generation, F10:

%cve = ncve/(ncve+nnon-cve),

= 23/(23+155) = 12.92%

**S2**

**Table A.20:** **table showing collection and scoring of cve flies from pupae heat-shocked (at 40°C for 45min) 23 hours a.p**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Pupae collected** | **Eclosed** |  |  |  | **Died** |
| **Days** |  |  | **cve female** | **cve male** | **Non-cve female** | **Non- cve male** |  |
| **Total** | **Time points.** | **209** | **14** | **6** | **85** | **66** | **38** |
|  |  |  |  |  |  |  |  |
| I | 10:00 am | **0** | 0 | 0 | 0 | 0 | 0 |
| I | 10:45 am | **7** | 4 | 2 | 0 | 0 | 1 |
| I | 11:30 am | **8** | 0 | 0 | 0 | 0 | 8 |
| I | 12:15 pm | **9** | 1 | 0 | 2 | 6 | 0 |
| I | 1:00 pm | **13** | 0 | 0 | 6 | 7 | 0 |
| I | 1:45 pm | **9** | 2 | 0 | 2 | 1 | 4 |
| I | 2:30 pm | **14** | 0 | 0 | 8 | 4 | 2 |
| I | 3:15 pm | **15** | 1 | 0 | 9 | 4 | 1 |
| I | 4:00 pm | **11** | 0 | 0 | 5 | 3 | 3 |
|  |  |  |  |  |  |  |  |
| II | 10:00 am | **5** | 4 | 1 | 0 | 0 | 0 |
| II | 10:45 am | **0** | 0 | 0 | 0 | 0 | 0 |
| II | 11:30 am | **0** | 0 | 0 | 0 | 0 | 0 |
| II | 12:15 pm | **13** | 0 | 0 | 7 | 6 | 0 |
| II | 1:00 pm | **12** | 0 | 1 | 3 | 2 | 6 |
| II | 1:45 pm | **8** | 0 | 0 | 3 | 5 | 0 |
| II | 2:30 pm | **15** | 1 | 0 | 6 | 5 | 3 |
| II | 3:15 pm | **30** | 0 | 1 | 16 | 8 | 5 |
| II | 4:00 pm | **13** | 1 | 0 | 8 | 3 | 1 |
| II | 4:45 pm | **27** | 0 | 1 | 10 | 12 | 4 |

Calculation for the percentage of crossveinless (cve):

%cve = ncve/(ncve+nnon-cve),

= 20/(20+151) = 11.69%

**Table A.21:** **table showing collection and scoring of cve flies from pupae heat-shocked (at 40°C for 45min) 24 hours a.p**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Pupae collected** | **Eclosed** |  |  |  | **Died** |
| **Days** |  |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **Total** | **Time points** | **209** | **28** | **17** | **50** | **60** | **55** |
|  |  |  |  |  |  |  |  |
| I | 10:00 am | **7** | 3 | 2 | 0 | 0 | 2 |
| I | 10:45 am | **11** | 0 | 0 | 4 | 6 | 1 |
| I | 11:30 am | **6** | 0 | 0 | 5 | 1 | 0 |
| I | 12:15 pm | **4** | 0 | 2 | 0 | 0 | 2 |
| I | 1:00 pm | **11** | 4 | 2 | 1 | 3 | 1 |
| I | 1:45 pm | **9** | 2 | 1 | 0 | 0 | 6 |
| I | 2:30 pm | **8** | 7 | 1 | 0 | 0 | 0 |
| I | 3:15 pm | **5** | 0 | 0 | 1 | 3 | 1 |
| I | 4:00 pm | **15** | 3 | 1 | 5 | 3 | 3 |
|  |  |  |  |  |  |  |  |
| II | 10:00 am | **7** | 3 | 2 | 0 | 0 | 2 |
| II | 10:45 am | **12** | 0 | 0 | 0 | 0 | 12 |
| II | 11:30 am | **17** | 1 | 3 | 0 | 7 | 6 |
| II | 12:15 pm | **13** | 0 | 0 | 7 | 6 | 0 |
| II | 1:00 pm | **12** | 4 | 1 | 3 | 2 | 2 |
| II | 1:45 pm | **18** | 0 | 0 | 3 | 5 | 10 |
| II | 2:30 pm | **16** | 1 | 0 | 6 | 6 | 3 |
| II | 3:15 pm | **12** | 0 | 1 | 3 | 8 | 0 |
| II | 4:00 pm | **12** | 0 | 0 | 8 | 3 | 1 |
| II | 4:45 pm | **14** | 0 | 1 | 4 | 7 | 3 |

Calculation for the percentage of crossveinless (cve):

%cve = ncve/(ncve+nnon-cve),

= 45/(45+110) = 29.03%

**Table A.22:** **table showing collection and scoring of cve flies from pupae heatshocked (at 40°C for 45min) 25 hours a.p**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Pupae collected** | **Eclosed** |  |  |  | **Died** |
| **Days** |  |  | **cve female** | **cve male** | **Non- cve female** | **Non- cve male** |  |
| **Total** | **Time points** | **209** | **20** | **8** | **47** | **57** | **82** |
|  |  |  |  |  |  |  |  |
| I | 10:00 am | **10** | 2 | 0 | 0 | 4 | 4 |
| I | 10:45 am | **13** | 4 | 1 | 5 | 2 | 1 |
| I | 11:30 am | **8** | 0 | 0 | 0 | 0 | 8 |
| I | 12:15 pm | **6** | 1 | 0 | 2 | 3 | 0 |
| I | 1:00 pm | **16** | 0 | 0 | 6 | 7 | 3 |
| I | 1:45 pm | **3** | 2 | 1 | 0 | 0 | 0 |
| I | 2:30 pm | **11** | 1 | 1 | 3 | 4 | 2 |
| I | 3:15 pm | **10** | 0 | 0 | 0 | 4 | 5 |
| I | 4:00 pm | **7** | 0 | 0 | 5 | 2 | 0 |
|  |  |  |  |  |  |  |  |
| II | 10:00 am | **10** | 0 | 0 | 0 | 1 | 9 |
| II | 10:45 am | **19** | 5 | 2 | 2 | 0 | 10 |
| II | 11:30 am | **12** | 4 | 0 | 0 | 0 | 8 |
| II | 12:15 pm | **11** | 0 | 0 | 7 | 0 | 4 |
| II | 1:00 pm | **7** | 0 | 1 | 3 | 2 | 1 |
| II | 1:45 pm | **4** | 0 | 0 | 3 | 0 | 1 |
| II | 2:30 pm | **22** | 1 | 0 | 2 | 6 | 13 |
| II | 3:15 pm | **14** | 0 | 1 | 3 | 11 | 0 |
| II | 4:00 pm | **16** | 0 | 0 | 4 | 3 | 9 |
| II | 4:45 pm | **10** | 0 | 1 | 2 | 8 | 4 |

Calculation for the percentage of crossveinless (cve):

%cve = ncve/(ncve+nnon-cve),

**Table A.25: Table showing various alternate phenotypes that were observed in some of the heat-shocked individuals, during the Waddington experiment in the upward selection line. Phenotypes such as Abnormal Abdomen (A)-like, Gull (G) like, Giant (gt) like, Beadex-Reccessive 49K (Bxr49k) like, White- Apricot (wa) like and Crimp (Cm) like.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Generation** | **pupae collected** | **A** | **DW** | **G** | **Gt** | **Bxr49k** | **wa** | **cm** |
| P | 1602 | 5 | 9 | 7 | 0 | 0 | 5 | 0 |
| F1 | 638 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| F2 | 480 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F3 | 462 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| F4 | 399 | 0 | 2 | 8 | 0 | 1 | 0 | 0 |
| F5 | 474 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| F6 | 359 | 3 | 0 | 1 | 0 | 0 | 0 | 0 |
| F7 | 182 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| F8 | 184 | 4 | 0 | 0 | 5 | 1 | 0 | 0 |
| F9 | 187 | 0 | 0 | 8 | 0 | 0 | 0 | 0 |
| F10 | 184 | 3 | 6 | 4 | 0 | 0 | 0 | 2 |