**Supplementary Table / Supplementary File 4**

**A: Homozygous mutants**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **18 degree** | days until… (after egg collection) | | | number of adults in total | Ø number of adults per vial |
|  | first instar larva | pupa | adult |
| control | 0 | 8.43 ± 0.13 | 16.8 ± 0.14 | 170 | 8.1 ± 1.82 |
| *rab3* | 0.4 ± 0.13 | 9.29 ± 0.18 | 18.1 ± 0.24 | 159 | 7.57 ± 1.02 |
| *rab4* | 0.1 ± 0.07 | 9.19 ± 0.09 | 17.38 ± 0.11 | 516 | 24.57 ± 2.1 |
| *rab9* | 0.29 ± 0.1 | 7.86 ± 0.08 | 16.71 ± 0.12 | 344 | 16.38 ± 1.41 |
| *rab14* | 0.1 ± 0.07 | 7.57 ± 0.11 | 15.76 ± 0.1 | 473 | 22.52 ± 1.82 |
| *rab18* | 0.33 ± 0.13 | 9.05 ± 0.21 | 17.62 ± 0.25 | 203 | 9.67 ± 1.17 |
| *rab19* | 0.1 ± 0.07 | 8.76 ± 0.14 | 18.1 ± 0.17 | 275 | 13.1 ± 1.44 |
| *rab21* | 0.29 ± 0.12 | 8.29 ± 0.1 | 16.95 ± 0.16 | 368 | 17.52 ± 0.98 |
| *rab23* | 0.24 ± 0.1 | 8.62 ± 0.11 | 17.19 ± 0.11 | 239 | 11.38 ± 1.01 |
| *rab26* | 0.24 ± 0.1 | 8.71 ± 0.1 | 17 ± 0.1 | 442 | 21.05 ± 1.91 |
| *rab27* | 0.1 ± 0.07 | 8.86 ± 0.1 | 17.1 ± 0.07 | 368 | 17.52 ± 1.16 |
| *rab32* | 0.1 ± 0.07 | 9.38 ± 0.11 | 18 ± 0.17 | 316 | 15.05 ± 0.87 |
| *rab39* | 0 | 9.05 ± 0.13 | 17.76 ± 0.1 | 523 | 24.9 ± 1.75 |
| *rab40* | 0.33 ± 0.16 | 10.19 ± 0.09 | 18.67 ± 0.14 | 261 | 12.42 ± 0.98 |
| *rabX1* | 1.71 ± 0.46 | 10.56 ± 0.26 | 19.24 ± 0.2 | 37 | 1.76 ± 0.32 |
| *rabX4* | 0.9 ± 0.14 | 12 ± 0.3 | 21.4 ± 0.53 | 8 | 0.38 ± 0.13 |
| *rabX6* | 0 | 9.14 ± 0.14 | 17.8 ± 0.13 | 446 | 21.24 ± 2.64 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **25 degree** | days until… (after egg collection) | | | number of adults in total | Ø number of adults per vial |
|  | first instar larva | pupa | adult |
| control | 0.15 ± 0.08 | 4.86 ± 0.08 | 8.95 ± 0.05 | 230 | 10.95 ± 2.01 |
| *rab3* | 0.2 ± 0.09 | 5 ± 0.12 | 9.2 ± 0.12 | 197 | 9.85 ± 1.45 |
| *rab4* | 0.1 ± 0.07 | 5.29 ± 0.1 | 9.25 ± 0.16 | 634 | 30.19 ± 2.06 |
| *rab9* | 0.14 ± 0.08 | 5 | 9 | 411 | 19.57 ± 1.63 |
| *rab14* | 0.1 ± 0.07 | 4.62 ± 0.11 | 8.67 ± 0.14 | 499 | 23.76 ± 1.75 |
| *rab18* | 0.05 ± 0.05 | 4.86 ± 0.08 | 8.9 ± 0.07 | 345 | 16.43 ± 1.34 |
| *rab19* | 0.24 ± 0.1 | 4.95 ± 0.08 | 9.71 ± 0.1 | 379 | 18.04 ± 1.51 |
| *rab21* | 0.19 ± 0.09 | 5 | 8.95 ± 0.05 | 412 | 19.62 ± 1.74 |
| *rab23* | 0.1 ± 0.07 | 4.86 ± 0.08 | 9 | 305 | 14.52 ± 1.71 |
| *rab26* | 0.2 ± 0.09 | 4.95 ± 0.05 | 9.1 ± 0.07 | 480 | 22.86 ± 2.1 |
| *rab27* | 0.14 ± 0.08 | 5 | 9 | 382 | 18.19 ± 1.12 |
| *rab32* | 0.29 ± 0.1 | 5.24 ±0.1 | 9.19 ± 0.11 | 459 | 21.86 ± 1.62 |
| *rab39* | 0.24 ± 0.1 | 5.14 ± 0.08 | 9.43 ± 0.11 | 627 | 29.86 ± 2.69 |
| *rab40* | 0.24 ± 0.1 | 5.7 ± 0.13 | 9.95 ± 0.15 | 241 | 11.48 ± 1.14 |
| *rabX1* | 0.56 ± 0.15 | 5.29 ± 0.14 | 9.67 ± 0.14 | 40 | 1.9 ± 0.35 |
| *rabX4* | 0.89 ± 0.08 | 7.14 ± 0.7 | 12 | 2 | 0.1 ± 0.1 |
| *rabX6* | 0.05 ± 0.05 | 5.05 ± 0.05 | 9.23 ± 0.1 | 459 | 21.86 ± 2.62 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **29 degree** | days until… (after egg collection) | | | # number of adults in total | Ø number of adults per vial |
|  | first instar larva | pupa | adult |
| control | 0.15 ± 0.09 | 4 | 7.67 ± 0.11 | 112 | 5.33 ± 1.21 |
| *rab3* | 0.1 ± 0.07 | 4.19 ± 0.09 | 7.57 ± 0.11 | 168 | 8 ± 0.81 |
| *rab4* | 0 | 4.52 ± 0.11 | 8 | 572 | 27 ± 2.14 |
| *rab9* | 0.14 ± 0.08 | 3.95 ± 0.05 | 7.57 ± 0.11 | 369 | 17.57 ± 1.73 |
| *rab14* | 0 | 4.05 ± 0.05 | 7.43 ± 0.11 | 516 | 24.57 ± 1.66 |
| *rab18* | 0.1 ± 0.07 | 4.19 ± 0.09 | 7.35 ± 0.11 | 291 | 13.86 ± 1.68 |
| *rab19* | 0.19 ± 0.09 | 4.05 ± 0.05 | 8.94 ± 0.18 | 132 | 7.33 ± 1.4 |
| *rab21* | 0.05 ± 0.05 | 4.19 ± 0.09 | 8 ± 0.2 | 378 | 18.9 ± 1.72 |
| *rab23* | 0.29 ± 0.1 | 4 | 7.95 ± 0.05 | 288 | 13.71 ± 0.92 |
| *rab26* | 0.29 ± 0.1 | 4.14 ± 0.08 | 7.81 ± 0.09 | 378 | 18 ± 1.76 |
| *rab27* | 0.05 ± 0.05 | 4 | 7.43 ± 0.11 | 444 | 21.14 ± 0.95 |
| *rab32* | 0.24 ± 0.1 | 4.33 ± 0.11 | 8 | 307 | 14.62 ± 1.01 |
| *rab39* | 0.19 ± 0.09 | 4.1 ± 0.07 | 7.81 ± 0.09 | 572 | 27.24 ± 2.3 |
| *rab40* | 0.33 ± 0.11 | 4 ± 0.12 | 7.31 ± 0.1 | 280 | 13.33 ± 0.74 |
| *rabX1* | 0.81 ± 0.16 | 4.75 ± 0.11 | 8.19 ± 0.1 | 38 | 1.81 ± 0.38 |
| *rabX4* | 0.75 ± 0.1 | 6.38 ± 0.56 | 13.5 ± 3.5 | 2 | 0.1 ± 0.1 |
| *rabX6* | 0.19 ± 0.09 | 4.05 ± 0.05 | 7.76 ± 0.1 | 445 | 21.19 ± 2.75 |

**B: Validation in backcrossed backgrounds**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **18 degree** | days until… (after egg collection) | | | number of adults in total | Ø number of adults per vial |
|  | first instar larva | pupa | adult |
| control | 0.05 ± 0.05 | 8.5 ± 0.1 | 16.7 ± 0.14 | 290 | 13.81 ± 1.25 |
| *rab3­* | 0.52 ± 0.19 | 10 ± 0.41 | 18 ± 0.41 | 23 | 5.75 ± 0.48 |
| *rab4* | 0.05 ± 0.05 | 9.38 ± 0.18 | 18.52 ± 0.15 | 190 | 9.05 ± 0.79 |
| *rab9* | 0.14 ± 0.08 | 8.33 ± 0.13 | 17 ± 0.18 | 284 | 13.52 ± 0.99 |
| *rab14* | 0.1 ± 0.07 | 8.38 ± 0.11 | 16.95 ± 0.19 | 176 | 8.38 ± 0.93 |
| *rab19* | 0.05 ± 0.05 | 8.86 ± 0.2 | 18.29 ± 0.22 | 224 | 10.67 ± 1.52 |
| *rab32* | 0.33 ± 0.11 | 10.32 ± 0.17 | 18.74 ± 0.2 | 136 | 7.16 ± 1 |
| *rab39* | 0 | 8,71 ± 0.27 | 17.8 ± 0.24 | 327 | 15.57 ± 1.32 |
| *rab40* | 0.19 ± 0.09 | 9.33 ± 0.22 | 17.86 ± 0.19 | 207 | 9.86 ± 0.67 |
| *rabX1* | 0.67 ± 0.16 | 10.1 ± 0.21 | 18.38 ± 0.27 | 33 | 2.54 ± 0.37 |
| *rabX4* | 1.88 ± 0.4 | - | - | - | - |
| *rabX6* | 0 | 9.29 ± 0.14 | 18.29 ± 0.22 | 378 | 18 ± 1.62 |

­

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **25 degree** | days until… (after egg collection) | | | number of adults in total | Ø number of adults per vial |
|  | first instar larva | pupa | adult |
| control | 0.05 ± 0.05 | 5.24 ± 0.1 | 9.19 ± 0.09 | 317 | 15.1 ± 1.07 |
| *rab19* | 0.05 ± 0.05 | 4.86 ± 0.08 | 9.95 ± 0.11 | 309 | 14.7 ± 1.51 |
| *rab40* | 0.43 ± 0.11 | 5.71 ± 0.14 | 9.9 ± 0.14 | 131 | 6.24 ± 0.67 |
| *rabX1* | 0.7 ± 0.22 | 5.35 ± 0.13 | 9.6 ± 0.15 | 36 | 1.8 ± 0.24 |
| *rabX4* | 0.88 ± 0.18 | 7 | 13 | 1 | 0.05 ± 0.05 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **29 degree** | days until… (after egg collection) | | | # number of adults in total | Ø number of adults per vial |
|  | first instar larva | pupa | adult |
| control | 0 | 4.19 ± 0.09 | 7.95 ± 0.05 | 265 | 12.62 ± 1.5 |
| *rab4* | 0 | 4.1 ± 0.07 | 7.81 ± 0.09 | 255 | 12.14 ± 0.95 |
| *rab18* | 0.05 ± 0.05 | 4 | 6.86 ± 0.1 | 332 | 15.81 ± 1.86 |
| *rab19* | 0 | 4.05 ± 0.05 | 8.48 ± 0.11 | 194 | 9.24 ± 1.32 |
| *rabX1* | 0.5 ± 0.11 | 5.13 ± 0.17 | 8.9 ± 0.28 | 30 | 2.31 ± 0.36 |
| *rabX4* | 1.07 ± 0.07 | 7 ± 0.58 | 13 | 1 | 0.05 ± 0.05 |

**C: Validation of mutants over deficiencies**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **18 degree** | days until… (after egg collection) | | | number of adults in total | Ø number of adults per vial |
|  | first instar larva | pupa | adult |
| control | 0.05 ± 0.05 | 8.5 ± 0.1 | 16.7 ± 0.14 | 290 | 13.81 ± 1.25 |
| *rab3*/*rab3* Df | 0.29 ± 0.1 | 8.52 ± 0.15 | 16.24 ± 0.17 | 96 | 4.57 ± 0.8 |
| *rab4*/*rab4* Df | 0.24 ± 0.1 | 9.19 ± 0.16 | 16.9 ± 0.23 | 233 | 11.1 ± 0.89 |
| *rab9*/*rab9* Df | 0.19 ± 0.09 | 7.57 ± 0.11 | 15.24 ± 0.15 | 168 | 8 ± 0.48 |
| *rab14*/*rab14* Df | 0.1 ± 0.07 | 7.62 ± 0.11 | 15.48 ± 0.15 | 192 | 9.14 ± 1.04 |
| *rab19*/*rab19* Df | 0.48 ± 0.11 | 8.24 ± 0.1 | 17.71 ± 0.3 | 142 | 6.76 ± 0.74 |
| *rab32*/*rab32* Df | 0.1 ± 0.07 | 9.67 ± 0.17 | 17.48 ± 0.13 | 192 | 9.14 ± 0.57 |
| *rab39*/*rab39* Df | 0.38 ± 0.13 | 8.62 ± 0.15 | 16.05 ± 0.11 | 124 | 5.9 ± 0.65 |
| *rab40*/*rab40* Df | 0.19 ± 0.09 | 9.9 ± 0.17 | 17.25 ± 0.3 | 116 | 5.52 ± 0.72 |
| *rabX1*/*rabX1* Df | 1.61 ± 0.14 | 9.67 ± 0.2 | 17.37 ± 0.35 | 85 | 4.25 ± 0.6 |
| *rabX4*/*rabX4* Df | 1.1 ± 0.18 | 11.11 ± 0.34 | 20.26 ± 0.49 | 57 | 2.85 ± 0.51 |
| *rabX6*/*rabX6* Df | 0.29 ± 0.1 | 9.45 ± 0.18 | 17.65 ± 0.13 | 153 | 7.65 ± 0.95 |

­

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **25 degree** | days until… (after egg collection) | | | number of adults in total | Ø number of adults per vial |
|  | first instar larva | pupa | adult |
| control | 0.05 ± 0.05 | 5.24 ± 0.1 | 9.19 ± 0.09 | 317 | 15.1 ± 1.07 |
| *rab19*/*rab19* Df | 0.29 ± 0.1 | 5.24 ± 0.1 | 10.1 ± 0.12 | 151 | 7.19 ± 0.69 |
| *rab40*/*rab40* Df | 0.33 ± 0.11 | 5.67 ± 0.14 | 9.38 ± 0.11 | 110 | 5.24 ± 0.1 |
| *rabX1*/*rabX1* Df | 0.76 ± 0.17 | 5.48 ± 0.13 | 9.35 ± 0.11 | 65 | 3.1 ± 0.34 |
| *rabX4*/*rabX4* Df | 1.36 ± 0.2 | 7.38 ± 0.18 | 12 ± 0.2 | 23 | 3.29 ± 0.52 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **29 degree** | days until… (after egg collection) | | | # number of adults in total | Ø number of adults per vial |
|  | first instar larva | pupa | adult |
| control | 0 | 4.19 ± 0.09 | 7.95 ± 0.05 | 265 | 12.62 ± 1.5 |
| *rab4*/*rab4* Df | 0.2 ± 0.09 | 4.3 ± 0.11 | 7.7 ± 0.11 | 236 | 11.8 ± 0.78 |
| *rab19*/*rab19* Df | 0.14 ± 0.08 | 4.1 ± 0.1 | 8.7 ± 0.1 | 117 | 5.57 ± 0.88 |
| *rabX1*/*rabX1* Df | 0.84 ± 0.14 | 4.75 ± 0.11 | 8.69 ± 0.12 | 24 | 1.2 ± 0.22 |
| *rabX4*/*rabX4* Df | 1 ± 0.12 | 5.71 ± 0.13 | 10.36 ± 0.2 | 26 | 1.86 ± 0.23 |