

**Table S1.** Morphological alterations scored at generation 20. Aberrant phenotypes labelled as “+” were the most representative; aberrant phenotypes labelled as “1” were observed just once.

| <b>Aberrant phenotypes</b> |                                   |                           |
|----------------------------|-----------------------------------|---------------------------|
| <b>Phenocopies</b>         | <b>Body deformations</b>          | <b>Additional traits</b>  |
| <sup>+</sup> Taxi-like     | <sup>+</sup> Smashed wings        | <sup>1</sup> Double veins |
| <sup>+</sup> Ebony-like    | Thick veins and wing blisters     | Wing spots                |
| <i>Vestigial</i> -like     | Crooked body (head, thorax, legs) | <sup>+</sup> Body spots   |
| <i>Apterous</i> -like      | <sup>+</sup> Malformed tergites   | Body “warts”              |
| <i>Curly</i> -like         | <sup>+</sup> Scutellar bristles   |                           |

**Table S2.** primer sequences used for PCR and qPCR.

| <b>Genes / TEs</b> | <b>Forward</b>                    | <b>Reverse</b>                |
|--------------------|-----------------------------------|-------------------------------|
| <i>rp49</i>        | CGG ATC GAT ATG CTA AGC TGT       | GCG CTT GTT CGA TCC GTA       |
| <i>piwi</i>        | GG ACA GCA GAA CAT CGT GTT GTT TC | GAC CCA TTC CAC TAG CTG C     |
| <i>ago3</i>        | GCA AAC TCC CCA CAA ATA TT        | GGC AAT GGG TTT TCT AGA TG    |
| <i>su(var)3-9</i>  | AGG AAC TTG CAG AAG CAG GA        | CTC ACA TGT CGC ACC AGT CT    |
| <i>Hsp26</i>       | GTG GAC GAC TCC ATC TTG GT        | TCC TTG GAC TTG TCC TCG AC    |
| <i>Hsp27</i>       | AAA GAT GGC TTC CAG GTG TG        | CCC TTG GGC AGG GTA TAC TT    |
| <i>Hsp68</i>       | GGC ACT CAA GGA CGC TAA AAT G     | CTG AAC CTT GGG AAT ACG AGT G |
| <i>Hsp83</i>       | ATG CCA GAA GAA GCA GAG ACC       | ACT CAT AGC GGA TCT TGT CCA G |
| <i>tko</i>         | CAA CCT GCA AGA GCA CAA CA        | AGC AAT GCA TTT GAA CAA CG    |
| <i>zuc</i>         | TTT GGC GGA TTC AAT AAA GC        | TTG TGC ATC AAG TTC GTG GT    |
| <i>dnmt2</i>       | TAC ACC CAT TAC ACC GAG GG        | CTT CCC GTG GCG TGA AAT AG    |
| <i>vas</i>         | TGT CTG ACG ACT GGG ATG ATG       | ATT TCC TCC TTG GTA GCC GC    |
| <i>thor</i>        | CAG ATG CCC GAG GTG TAC TC        | CAT GAA AGC CCG CTC GTA GA    |
| <i>mod(mdg4)</i>   | CCG CAA GAT GTT CAC TCA GA        | GAT TCC GCG GTG CTA ATA AA    |
| <i>Hel25E</i>      | GAT GAG GAG CAG ACC GAG AC        | ACT TGG CCT GAC AGA GGA TG    |
| <i>412</i>         | TTG ATG GGC AAA AGA TCC AT        | TTG CTG GAA TTG TCG TTT CA    |
| <i>oskar</i>       | CGA CAA CGT GAC GGA TTT CCT       | GGA GGT GAC CGT TCT TCA GG    |
| <i>adh</i>         | AGC AAA AGG GCA CAC AAT TGA       | CGG CAC ACA CGG TTT GTT T     |

**Table S3.** Aberrant phenotypes (A) and scutellar bristle numbers (B). Aberrant: morphological alterations and phenocopies different from wild-type such as phenotype (A); scutellar bristle number different from four (B).

| <b>Aberrant phenotypes</b>      |          |              |         |          |              |         |      |
|---------------------------------|----------|--------------|---------|----------|--------------|---------|------|
| A) Line                         | CCRT     |              |         | ST       |              |         |      |
|                                 | aberrant | Non aberrant | p-value | aberrant | Non aberrant | p-value |      |
| <b>10.1</b>                     | Selected | 3            | 27      | 0.61     | 1            | 29      | 1    |
|                                 | Control  | 1            | 29      |          | 0            | 30      |      |
| <b>15.4</b>                     | Selected | 1            | 29      | 1        | 0            | 30      | 0.49 |
|                                 | Control  | 0            | 30      |          | 2            | 28      |      |
| <b>6.6</b>                      | Selected | 5            | 25      | 1        | 1            | 34      | 1    |
|                                 | Control  | 4            | 26      |          | 2            | 33      |      |
| <b>outbred</b>                  | Selected | 9            | 21      | 0.10     | 2            | 28      | 1    |
|                                 | Control  | 3            | 27      |          | 1            | 29      |      |
| <b>Scutellar bristle number</b> |          |              |         |          |              |         |      |
| B) Line                         | CCRT     |              |         | ST       |              |         |      |
|                                 | aberrant | Non aberrant | p-value | aberrant | Non aberrant | p-value |      |
| <b>10.1</b>                     | Selected | 0            | 30      | 0.24     | 3            | 27      | 1    |
|                                 | Control  | 3            | 27      |          | 2            | 28      |      |
| <b>15.4</b>                     | Selected | 1            | 29      | 1        | 0            | 30      | 0.49 |
|                                 | Control  | 0            | 30      |          | 2            | 28      |      |
| <b>6.6</b>                      | Selected | 19           | 11      | 0.004    | 10           | 25      | 0.61 |
|                                 | Control  | 7            | 23      |          | 13           | 22      |      |
| <b>outbred</b>                  | Selected | 3            | 27      | *0.10    | 8            | 22      | 0.18 |
|                                 | Control  | 9            | 21      |          | 3            | 27      |      |

