**Supplementary Table 1 PCR primers used in this study**

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| Prime name | Sequence | Description |
| Ssk1-5Ffor | GGCCGATGTGTAGACTGGTT | 5F flanking sequence |
| Ssk1-5Frev | AACCGATGGACAAACGTAGC |
| Ssk1-3Ffor | ATTGATTTCGACGGATGGAG | 3F flanking sequence |
| Ssk1-3Frev | CGATAGCTTTTGTTGCGTGA |
| Ssk1-compfor | CCGATGTGTAGACTGGTTC | complementation |
| Ssk1-comprev | AGGTGTGGAGGTTGAATTG |
| Ge-F | GACGTTAACTGATATTGAAGGA | geneticin resistant cassett |
| Ge-R | GCTGGTGACGGAATTTTCAT |
| VDAG\_03674-F | CAAGTCGATCGGCATGAAGG | qRT-PCR of VDAG\_03674 |
| VDAG\_03674-R | CACCAACCCCATCTCTCACT |
| VDAG\_00190-F | CTCGTCCTGATCCGTATCCCA | qRT-PCR of VDAG\_00190 |
| VDAG\_00190-R | TGTGAATTGAGGCAGGCATG |
| VDAG\_03665-F | TGGCATCAAGACAGACATGTA | qRT-PCR of VDAG\_03665 |
| VDAG\_03665-R | ACAACGCGAGCGATGTCGAT |
| VDAG\_03393-F | AAAGGTGTTTGAGAGCGGAC | qRT-PCR of VDAG\_03393 |
| VDAG\_03393-R | ATCTCCCTCTCCACAACAGC |
| VDAG\_00183-F | TATGTCCCTGGCGGCTTTAA | qRT-PCR of VDAG\_00183 |
| VDAG\_00183-R | TGATCCACTCGCAGTCTTCA |
| VdBt-up | AGCTCACCCAGCAGATGTTC | qRT-PCR of β-tubilin |
| VdBt-down | TCGACCTCCTTCATGGCAAC |
| Ssk1-s-F | AGGTGTGGAGGTTGAATTG | Probe of southern blot |
| Ssk1-s-R | CGATAGCTTTTGTTGCGTGA |
| Ssk1-Infor | ACACTCCTCGTTCCATCC | Mutant sceening |
| Ssk1-Inrew | GCTCACTCGTCACTGATC |
| Ssk2-Exfor | TCTGCTCCTGCTCCTATC | Mutant sceening |
| Ssk2-Exrew | AGTCTTGACATTGCGTAGTA |