**Table S1. Primers used in this study**

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| primer | sequence |  Reference |
| aroG1A1B | ATCGCTCAAGGACGTCACCA | This study |
| aroG1B1C | GCCAGTGCGCGTGCGCGGGCGGAAAGCTCCCGGGGGATGT | This study |
| aroG1A2C | ACATCCCCCGGGAGCTTTCCGCCCGCGCACGCGCACTGGC | This study |
| aroG1B2H | CTAAGCTTCGGTTCGCCAGGGTTGTC | This study |
| aroG2A1B | ATGGATCCTGAACTACGTCGCGAACATGACGG | This study |
| aroG2B1C | CCCCTCGACGCGAGTCCCCGTGACGGCGGAAATCGGCGGG | This study |
| aroG2A2C | CCCGCCGATTTCCGCCGTCACGGGGACTCGCGTCGAGGGG | This study |
| aroG2B2H | TCAAGCTTAACGACACCAGCATGGCGCAAAGC | This study |
| aroG1B3H | TCAAGCTTTCAGTTGCCGTTGCGGGGCA | This study |
| aroG2B3H | CGAAGCTTGCTAGGCGCCAAACCAGCA | This study |
| aroG1MuB1C | AGCTCTTTCAGTTCGCGGGTACCCAGGTCGTCGGTGTTCT | This study |
| aroG1MuA2C | AGAACACCGACGACCTGGGTACCCGCGAACTGAAAGAGCT | This study |
| aroG2MuB1C | CGCGGTACCCGGGGCAGTCCGCCGATT | This study |
| aroG2MuA2C | CCGGGTACCGCGCACCGCTCGTGTTT | This study |
| PG1::G2B1C | GCAGTCCGCCGATTGCCCATGGAAAGCTCCCGGGGGATGT | This study |
| PG1::G2A2C | ACATCCCCCGGGAGCTTTCCATGGGCAATCGGCGGACTGC | This study |
| PG2::G1B1C | TCGTCGGTGTTCTTCGGCATTGACGGCGGAAATCGGCGGA | This study |
| PG2::G1A2C | TCCGCCGATTTCCGCCGTCAATGCCGAAGAACACCGACGA | This study |
| PG1::G2dNB1C | ATGCGCACGTCATCGATGCGCATGGAAAGCTCCCGGGGGA | This study |
| PG1::G2dNA2C | TCCCCCGGGAGCTTTCCATGCGCATCGATGACGTGCGCAT | This study |
| PG2::G2dNB1C | ATGCGCACGTCATCGATGCGCATTGACGGCGGAAATCGGC | This study |
| PG2::G2dNA2C | GCCGATTTCCGCCGTCAATGCGCATCGATGACGTGCGCAT | This study |
| glmsdown | GCGCTCAAGCTCAAGGAGATC | Zhang *et al*., 2011 |
| Tn7R | CACAGCATAACTGGACTGATTTC | Choi *et al*., 2005 |
| lacZR1 | GCGCCATTCGCCATTCAGGCT | Zhang *et al*., 2013 |