**S1 Table. Komagataella phaffii** strains used in this study.

<table>
<thead>
<tr>
<th>Strain</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBS7435 (NRRL Y-11430; CECT 11047)</td>
<td>Genome reference strain developed by Phillips Petroleum. Progenitor of strains GS115 and X-33. Inferred by Braun-Galleani et al. (2019) and Brady et al. (2020) to be derived from NRRL Y-7556 (CBS 2612), which is the type strain of <em>K. phaffii</em> and is a natural isolate from black oak (<em>Quercus kelloggii</em>), California, USA. Wild type.</td>
<td>Spanish Type Culture Collection (CECT)</td>
</tr>
<tr>
<td>Pp2 (NRRL Y-17741)</td>
<td>Natural isolate from Emory oak (<em>Quercus emoryi</em>), Arizona, USA. Wild type.</td>
<td>NRRL collection (USDA ARS)</td>
</tr>
<tr>
<td>Pp4 (NRRL YB-378)</td>
<td>Natural isolate from elm tree (<em>Ulmus americana</em>), USA. Wild type.</td>
<td>NRRL collection (USDA ARS)</td>
</tr>
<tr>
<td>CBS_PGAP</td>
<td>CBS7435 transformant harboring an integrated empty pGAP2α vector (control strain)</td>
<td>This study</td>
</tr>
<tr>
<td>CBS_BGL9</td>
<td>CBS7435 transformant harboring BGL expression cassette</td>
<td>This study</td>
</tr>
<tr>
<td>Pp2_BGL5</td>
<td>Pp2 transformant harboring BGL expression cassette</td>
<td>This study</td>
</tr>
<tr>
<td>Pp4_BGL3</td>
<td>Pp4 transformant harboring BGL expression cassette</td>
<td>This study</td>
</tr>
<tr>
<td>CBS_BGL9/Pp2_BGL5</td>
<td>Hybrid diploid isolated from CBS_BGL9 x Pp2_BGL5 cross</td>
<td>This study</td>
</tr>
<tr>
<td>CBS_BGL9/Pp4_BGL3</td>
<td>Hybrid diploid isolated from CBS_BGL9 x Pp4_BGL3 cross</td>
<td>This study</td>
</tr>
<tr>
<td>CBS_BGL9_HOC1FL</td>
<td>CBS_BGL9 strain with corrected, full-length HOC1 allele</td>
<td>This study</td>
</tr>
<tr>
<td>Pp2_BGL5_HOC1DS</td>
<td>Pp2_BGL5 strain with disrupted HOC1 allele (6xSTOP tag)</td>
<td>This study</td>
</tr>
<tr>
<td>Pp4_BGL3_HOC1DS</td>
<td>Pp4_BGL3 strain with disrupted HOC1 allele (6xSTOP tag)</td>
<td>This study</td>
</tr>
<tr>
<td>CBS_BGL9/Pp2_BGL5_HOC1DS</td>
<td>CBS_BGL9/Pp2_BGL5 diploid with the truncated (frameshifted) HOC1 allele of CBS_BGL9 and disrupted HOC1 allele of Pp2_BGL5</td>
<td>This study</td>
</tr>
<tr>
<td>CBS_BGL9/Pp4_BGL3_HOC1DS</td>
<td>CBS_BGL9/Pp4_BGL3 diploid with the truncated (frameshifted) HOC1 allele of CBS_BGL9 and disrupted HOC1 allele of Pp4_BGL3</td>
<td>This study</td>
</tr>
<tr>
<td>CBS_BGL9_ira1/Pp2_BGL5_ira1</td>
<td>Hemizygote derivative of CBS_BGL9/Pp2_BGL5 harboring a disrupted IRA1 allele of CBS_BGL9</td>
<td>This study</td>
</tr>
<tr>
<td>CBS_BGL9_ira1/Pp2_BGL5_ira1</td>
<td>Hemizygote derivative of CBS_BGL9/Pp2_BGL5 harboring a disrupted IRA1 allele of Pp2_BGL5</td>
<td>This study</td>
</tr>
<tr>
<td>CBS_BGL9_ira1N200D</td>
<td>CBS_BGL9 strain harboring an IRA1 N200D (c.598A&gt;G) allele</td>
<td>This study</td>
</tr>
<tr>
<td>CBS_BGL9_ira1V393L</td>
<td>CBS_BGL9 strain harboring an IRA1 V393L (c.1177G&gt;T) allele</td>
<td>This study</td>
</tr>
<tr>
<td>CBS_BGL9_ira1D399N</td>
<td>CBS_BGL9 strain harboring an IRA1 D399N (c.1195G&gt;A) allele</td>
<td>This study</td>
</tr>
<tr>
<td>CBS_BGL9_ira1G1466D</td>
<td>CBS_BGL9 strain harboring an IRA1 G1466D (c.4397G&gt;A) allele</td>
<td>This study</td>
</tr>
<tr>
<td>CBS_BGL9_ira1K404fs</td>
<td>CBS_BGL9 strain harboring a frameshifted allele of IRA1 at amino acid position 404</td>
<td>This study</td>
</tr>
<tr>
<td>IT1005</td>
<td>Strain expressing codon-optimized Aspergillus niger β-galactosidase from UPP constitutive promoter. BG08 genetic background (derivative of NRRL Y-11430).</td>
<td>Ilya Tolstorukov</td>
</tr>
<tr>
<td>IT1018</td>
<td>Strain expressing codon-optimized Aspergillus niger α-galactosidase from UPP constitutive promoter. NRRL Y-11430 genetic background.</td>
<td>Ilya Tolstorukov</td>
</tr>
</tbody>
</table>

NRRL, Northern Regional Research Laboratory, US Department of Agriculture; CBS, Centraalbureau voor Schimmelcultures (Westerdijk Institute), The Netherlands.