

**Table 1.** Main growth parameters obtained in this work for *Kluyveromyces marxianus* compared with those obtained for other yeast strains

| Yeast strain                                | Cultivation mode          | $\mu$ (h <sup>-1</sup> )    | $\mu_s$ [g DW h <sup>-1</sup> ] | DT (h) | $Y_{WS}$ (g DW g <sup>-1</sup> ) | qO <sub>2</sub> (mmol g <sup>-1</sup> h <sup>-1</sup> ) | qCO <sub>2</sub> (mmol g <sup>-1</sup> h <sup>-1</sup> ) | RQ   | Reference   |
|---|---------------------------|-----------------------------|---------------------------------|--------|----------------------------------|---|--|------|---|
| <i>K. marxianus</i> ATCC 26548 (= CBS 6556) | Batch*                    | $\mu_{max} = 0.56 \pm 0.02$ | $1.095 \pm 0.005$               | 1.24   | $0.51 \pm 0.02$                  | $11.05 \pm 1.03$  | $12.06 \pm 0.55$   | 1.09 | This work   |
|   | Continuous <sup>†,‡</sup> | $D = 0.1$                   | 0.22                            | 6.93   | $0.45 \pm 0.00$                  | $2.67 \pm 0.07$   | $2.69 \pm 0.08$  | 1.01 |   |
|   | Continuous <sup>†</sup>   | $D = 0.1$                   | 0.20                            | 6.93   | $0.49 \pm 0.00$                  | $2.87 \pm 0.08$   | $2.82 \pm 0.09$  | 0.98 |   |
|   | Continuous <sup>†</sup>   | $D = 0.25$                  | 0.52                            | 2.77   | $0.48 \pm 0.00$                  | $6.65 \pm 0.06$   | $7.30 \pm 0.07$  | 1.10 |   |
| <i>K. marxianus</i> CBS 6556                | Continuous <sup>†</sup>   | $D = 0.5$                   | 1.05                            | 1.39   | $0.48 \pm 0.00$                  | $11.09 \pm 0.19$  | $11.50 \pm 0.12$   | 1.04 |   |
|   | Batch                     | $\mu_{max} = 0.44 \pm 0.03$ | 0.90                            | 1.57   | 0.49                             | –   | 13.46  | –    | Bellaver et al. (2004)  |
|   | Continuous <sup>§</sup>   | $D = 0.1$                   | –                               | 6.93   | –                                | –   | $4.0 \pm 0.3$  | –    | Rouwenhorst et al. (1991)   |
|   | Continuous <sup>¶</sup>   | $D = 0.1$                   | –                               | 6.93   | –                                | 3.1   | –  | –    | Verdlyn et al. (1992)   |
|   | Continuous <sup>  </sup>  | $D = 0.1$                   | 0.23                            | 6.93   | 0.43                             | –   | –  | –    | Postma & van den Broek (1990)   |
|   | Continuous <sup>  </sup>  | $D = 0.2$                   | 0.46                            | 3.46   | 0.43                             | –   | –  | –    |   |
|   | Continuous <sup>**</sup>  | $D = 0.2$                   | 0.42                            | 3.46   | 0.48                             | –   | –  | –    | Hensing et al. (1994)   |
|   | Continuous <sup>††</sup>  | $D = 0.2$                   | 0.5                             | 3.46   | 0.40                             | –   | –  | –    |   |
| <i>K. lactis</i> CBS 2359                   | Continuous                | $D = 0.1$                   | 0.21                            | 6.93   | 0.48                             | 3.7   | 3.7  | 1    | Kiers et al. (1998)   |
|   | Continuous                | $D = 0.2$                   | 0.41                            | 3.46   | 0.49                             | 6.2   | 6.2  | 1    |   |
|   | Continuous                | $D = 0.4$                   | 0.82                            | 1.73   | 0.49                             | 11.3  | 11.3   | 1    |   |
| <i>S. kluyveri</i> Y708                     | Continuous                | $D = 0.1$                   | 0.22                            | 6.93   | 0.46                             | 4.2   | 4.1  | 0.98 | Møller et al. (2002)  |
|   | Continuous                | $D = 0.3$                   | 0.62                            | 2.31   | 0.48                             | 9.5   | 10   | 1.05 |   |
|   | Continuous                | $D = 0.54$                  | 1.08                            | 1.28   | 0.50                             | 13.6  | 15   | 1.1  |   |
|   | Continuous                | $D = 0.63$                  | 2.62                            | 1.10   | 0.24                             | 6.8   | 20.4   | 3.0  |   |
| <i>S. cerevisiae</i> CBS 8066               | Continuous <sup>††</sup>  | $D = 0.1$                   | 0.20                            | 6.93   | 0.51                             | 2.5   | 2.7  | 1.08 | Bruinenberg et al. (1986), Postma et al. (1989a, b), van Dijken et al. (1993) |
|   | Continuous <sup>††</sup>  | $D = 0.3$                   | 0.60                            | 2.31   | 0.50                             | 7.5   | 8.5  | 1.1  |   |
|   | Continuous <sup>††</sup>  | $D = 0.4$                   | 1.82                            | 1.73   | 0.22                             | 9   | 20.5   | 2.3  |   |
|   | Continuous                | $D = 0.1$                   | 0.21                            | 2.77   | 0.49                             | –   | –  | 1.07 | Furukawa et al. (1983)  |
| <i>S. cerevisiae</i> LBGH-1022              | Continuous                | $D = 0.25$                  | 0.50                            | 2.77   | 0.50                             | 7.1   | 7.6  | 1.07 |   |
|   | Continuous                | $D = 0.3$                   | 1.41                            | 2.31   | 0.21                             | 3.4   | 18.5   | 5.44 |   |
|   | Continuous                | $D = 0.1$                   | 0.21                            | 6.93   | 0.48                             | 2.7   | 2.8  | 1.04 | van Hoek et al. (1998b)   |
|   | Continuous                | $D = 0.25$                  | 0.20                            | 2.77   | 0.49                             | 7.0   | 7.3  | 1.04 |   |
| <i>S. cerevisiae</i> CEN.PK 113-7D          | Continuous                | $D = 0.38$                  | 2.37                            | 1.82   | 0.16                             | 3.9   | 21   | 5.38 |   |
|   | Continuous                | $D = 0.1$                   | 0.21                            | 6.93   | 0.48                             | 2.5   | 2.7  | 1.08 | van Hoek et al. (1998a)   |
|   | Continuous                | $D = 0.25$                  | 0.52                            | 2.77   | 0.48                             | 7.0   | 7.5  | 1.07 |   |
|   | Continuous                | $D = 0.4$                   | 2.00                            | 1.73   | 0.20                             | 3.7   | 18.9   | 5.11 |   |

\*Average and SD from two independent cultivations.

†Average and SD calculated from five samples obtained at 1-h intervals during each steady state.

‡This cultivation was carried out under the same conditions as the other experiments in this work (30 °C, pH 5.0, glucose 10 g L<sup>-1</sup>), except for aeration, which was 2.5 v.v.m., instead of 1 v.v.m.

§Sucrose 5 g L<sup>-1</sup> (40 °C).

¶37 °C.

||40 °C.

\*\*Sucrose 5 g L<sup>-1</sup> (30 °C).

††Sucrose 5 g L<sup>-1</sup> (40 °C).

‡‡Glucose 15 g L<sup>-1</sup>.

DT, doubling time;  $Y_{WS}$ , biomass yield on substrate; v.v.m., air volume per culture volume per minute.

Some data from other authors presented in this table were obtained from graphics or calculated.