**Additional information**

**Conversion of sugar beet residues into lipids by *Lipomyces starkeyi* for biodiesel production**

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**Figure S1.** FTIR microspectroscopy analysis of *L. starkeyi*. The FTIR absorption spectra of *L. starkeyi* intact cells are reported at 0 and 144 h of growth in 3% SBP hydrolysate containing 6% of molasses. For comparison, spectra have been normalized to amide I band area. The assignment of the bands due to the biomolecules discussed in the text is reported.

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**Figure S2**. Linear relation between OD660 and lipid accumulation measured as CH stretching band area (**A**) and ester C = O (**B**) by Fourier transform infrared (FTIR) of *L. starkeyi* cells growing in 3 % SBP hydrolysate blended with 1 %, 2 % or 6 % of molasses in batch and pulsed-fed batch cultures. Tables show the values corresponding to the slope of the regression lines and to the coefficients of determination (R2).

**Figure S3.** Sucrose, glucose, arabinose, acetic acid and lactic acid concentrations during growth of *L. starkeyi* in SBP hydrolysate generated at 3 % TS fed with pulses of molasses.





**Figure S4.** Lipase catalyzed transesterification of lipids produced by *L. starkeyi* cultivated in SBP fed with molasses (pattern E). 500 µl of lipids were incubated with 12 mg of Novozym 435 at 37°C and 160 rpm. 2.5 % of methanol were added at time 0, 24, 48 and 72 h (indicated by arrows).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Cultivation mode | Molasses | SBP | µ | *P* |
| Batch | - | 1 %  | ND |  |
| - | 2 % | 0.071 ± 0.004 | a |
| - | 3 % | 0.079 ± 0.003 | b |
| - | 4 % | 0.081 ± 0.003 | b |
| - | 5 % | 0.078 ± 0.003 | b |
| - | 6 % | ND |  |
| - | 7 % | ND |
| 6 % | 3 % | 0.089 ± 0.002 | a’ |
| Pulsed-fed batch | 6 % | 3 % | 0.096 ± 0.003 | b’ |

**Table S1.** Growth rates of *L. starkeyi* in different growth conditions. Cells were grown at different % of SBP hydrolysate, with or without 6 % molasses, in batch and pulsed fed-batch cultures. Growth rates has been calculated thanks to a semi-logarithmic graph (data not shown). ND: not determined; statistical significance is expressed by letters. *P* < 0.05.