Production of added-value metabolites by *Yarrowia lipolytica* growing in olive mill wastewater-based media under aseptic and non-aseptic conditions

Dimitris Sarris[a], Nikolaos G. Stoforos[a], Athanasios Mallouchos[a], Ioannis K. Kookos[b], Apostolis A. Koutinas[a], George Aggelis[c], Seraphim Papanikolaou[a]*

[a] Department of Food Science and Human Nutrition, Agricultural University of Athens, 75 Iera Odos, 11855 – Athens, Greece

[b] Department of Chemical Engineering, University of Patras, 26504, Patras, Greece

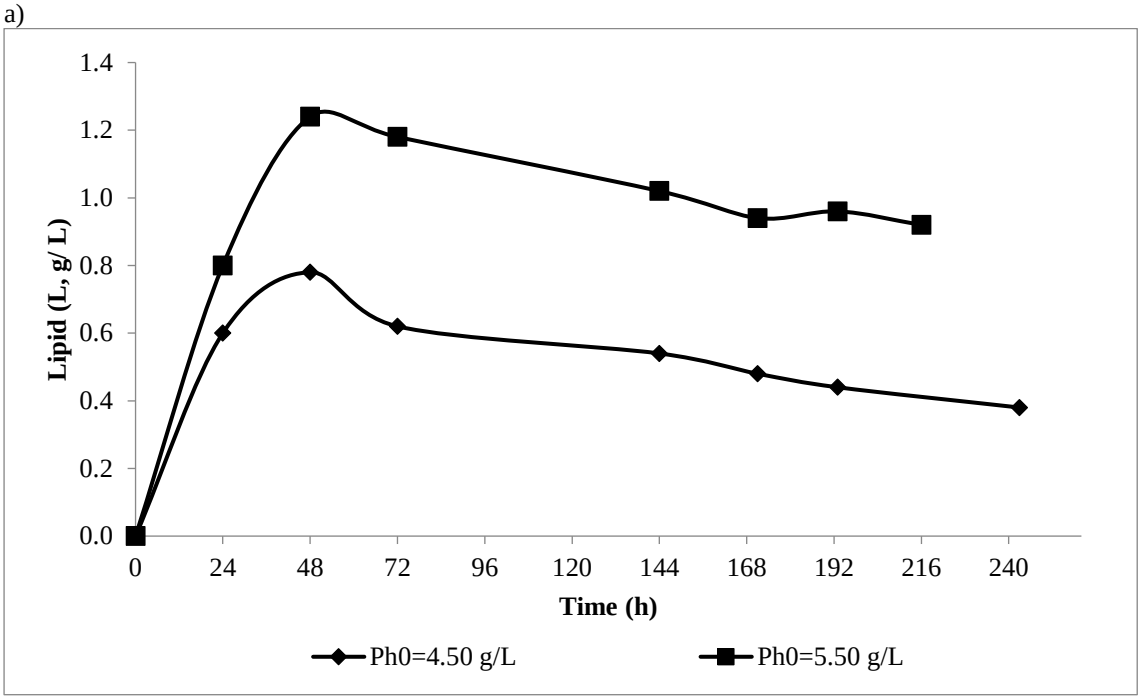
[c] Department of Biology, Division of Genetics, Cell and Development Biology, University of Patras, 26504 – Patras, Greece

Running title: Olive mill wastewater-based media fermentation by *Yarrowia lipolytica*

*Corresponding author: Dr. S. Papanikolaou, Associate Professor, Laboratory of Food Microbiology and Biotechnology, Department of Food Science and Human Nutrition, Agricultural University of Athens, Iera Odos 75 – Athens, Greece, e-mail: spapanik@aua.gr, tel., fax: +30-210-5294700

Supplementary material

a)



(b)

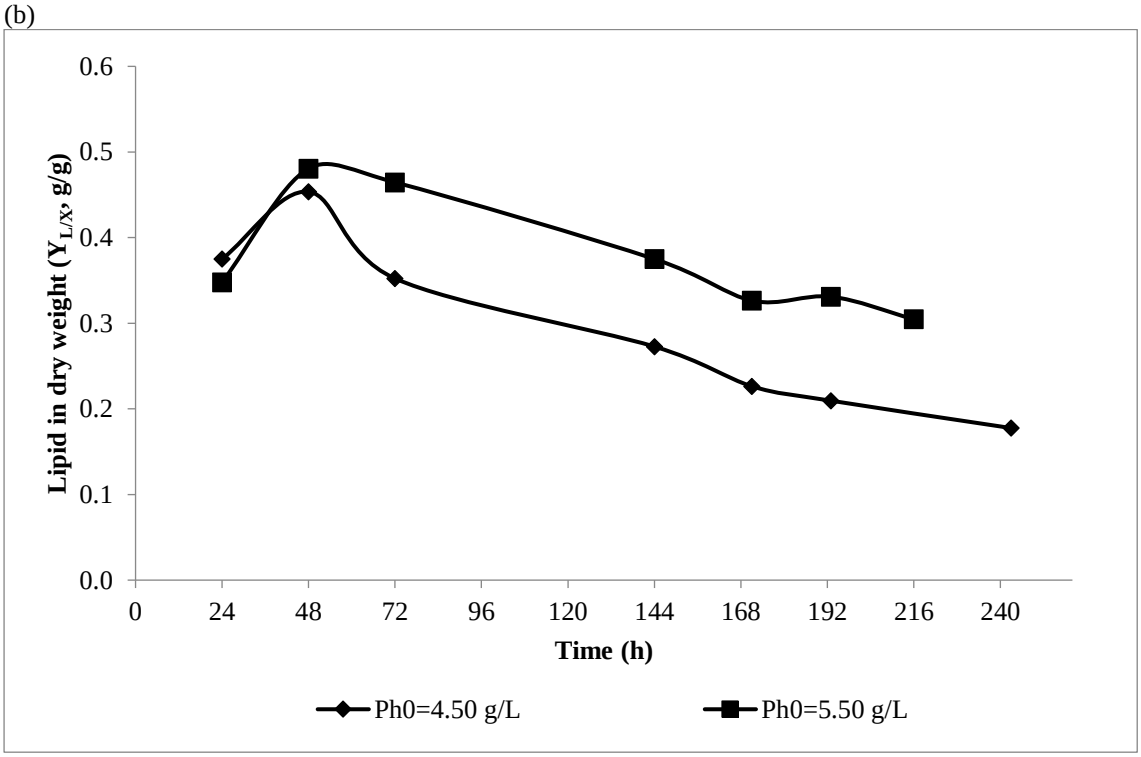


Fig. S1 Cellular lipids (L, g/L) (a) and total cellular lipid in dry weight ($Y_{L/X}$, g/g) (b) evolution during growth of *Yarrowia lipolytica* ACA-YC 5033 on OMW-based media (Glc_0=35.0±2.0 g/L, $(NH_4)_2SO_4$=0.50±0.05 g/L, yeast extract=0.50±0.05 g/L; initial phenolic compounds concentration 4.50±0.35 g/L and 5.50±0.40 g/L) enriched with commercial glucose in nitrogen-limited conditions. Culture conditions: growth on 250-mL flasks at 180 ±5 rpm, initial pH=6.0 ±0.1, pH ranging between 5.0 and 6.0, DOT>20% *v/v*, incubation temperature *T*=28 °C. Each point is the mean value of two independent measurements.

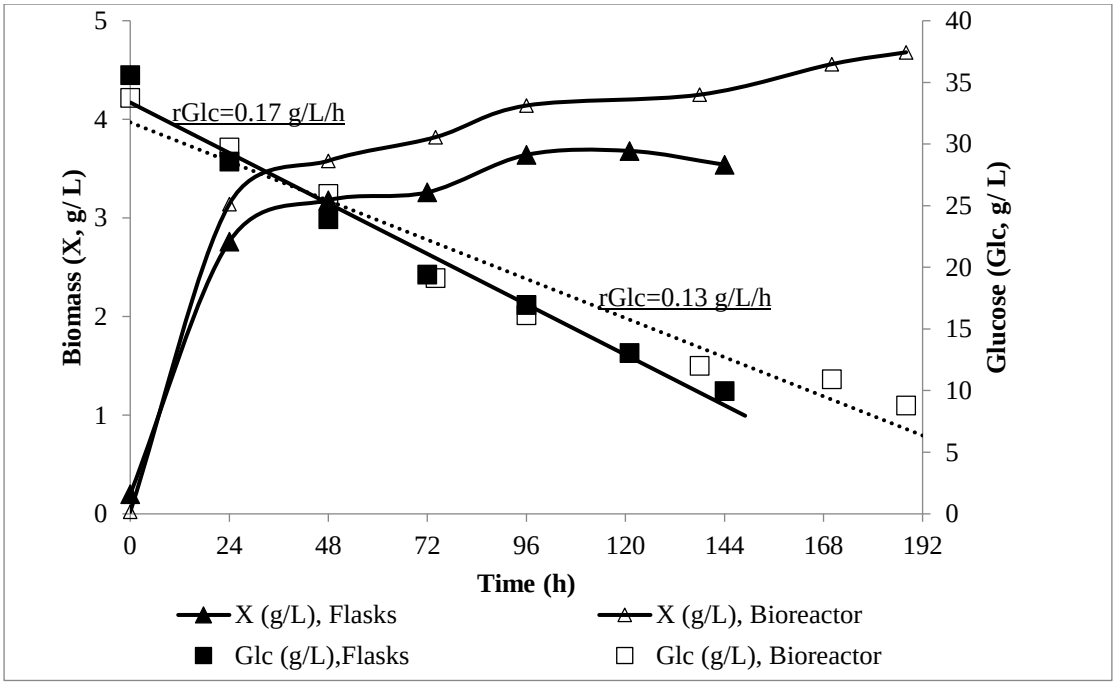


Fig. S2 Comparison of *Yarrowia lipolytica* ACA-YC 5033 kinetics between aseptic shake-flask and aseptic batch-bioreactor cultures regarding biomass (X, g/L) and glucose (Glc, g/L) evolution on OMW-based media enriched with commercial glucose with initial phenolic compounds concentration 2.90±0.25 g/L. Culture conditions: growth on aseptic shake-flask 250-mL cultures agitated at 180 ±5 rpm, Glc0~35.0 g/L, $(NH_4)_2SO_4$=0.50±0.05 g/L, yeast extract=0.50±0.05 g/L, initial pH=6.0 ±0.1, pH ranging between 5.0 and 6.0, DOT>20% *v/v*, incubation temperature *T*=28 °C; aseptic batch bioreactor cultures agitated at 300 rpm, Glc_0~35.0 g/L, $(NH_4)_2SO_4$=0.50±0.05 g/L, yeast extract=0.50±0.05 g/L, initial pH=6.0 ± 0.1, pH ranging between 5.0 and 6.0, DOT>20% *v/v*, incubation temperature *T*=28 °C, and sparging of air at 1.0 vvm. Each point is the mean value of two independent measurements.

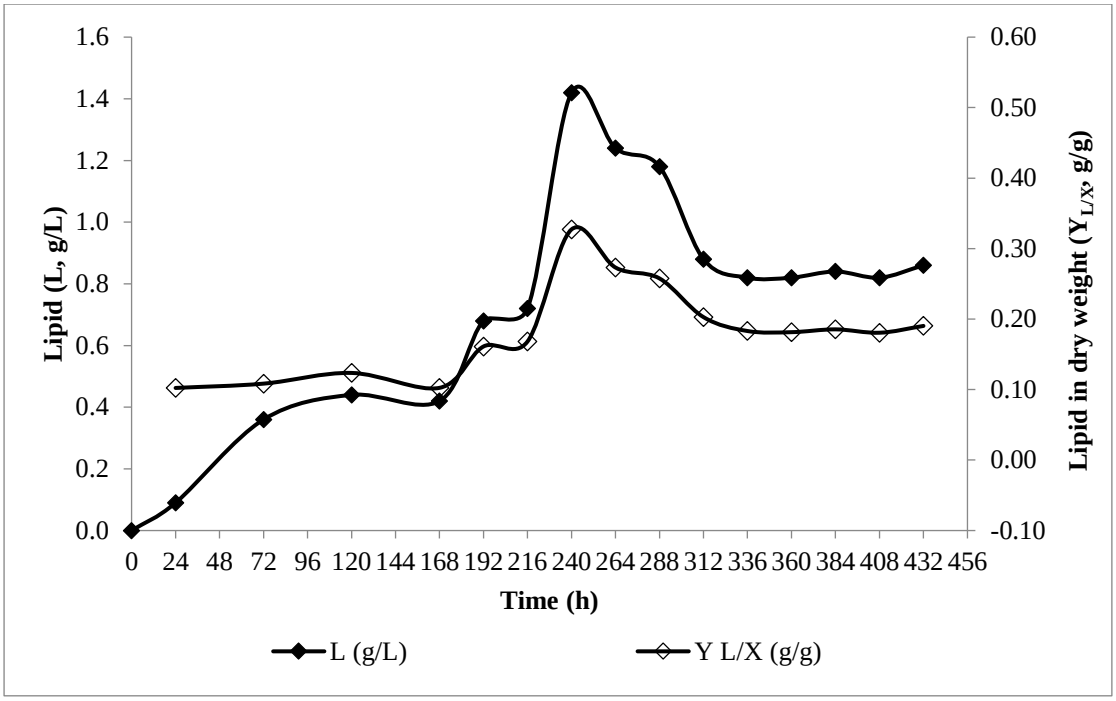


Fig. S3 Cellular lipids (L, g/L) and total cellular lipid in dry weight ($Y_{L/X}$, g/g) evolution during growth of *Yarrowia lipolytica* ACA-YC 5033 on OMW-based media (Glc_0~80.0 g/L, $(NH_4)_2SO_4$=0.50±0.05 g/L, yeast extract=0.50±0.05 g/L; initial phenolic compounds concentration 2.90±0.25 g/L) enriched with commercial glucose in nitrogen-limited conditions. Culture conditions as described in Fig. S1.

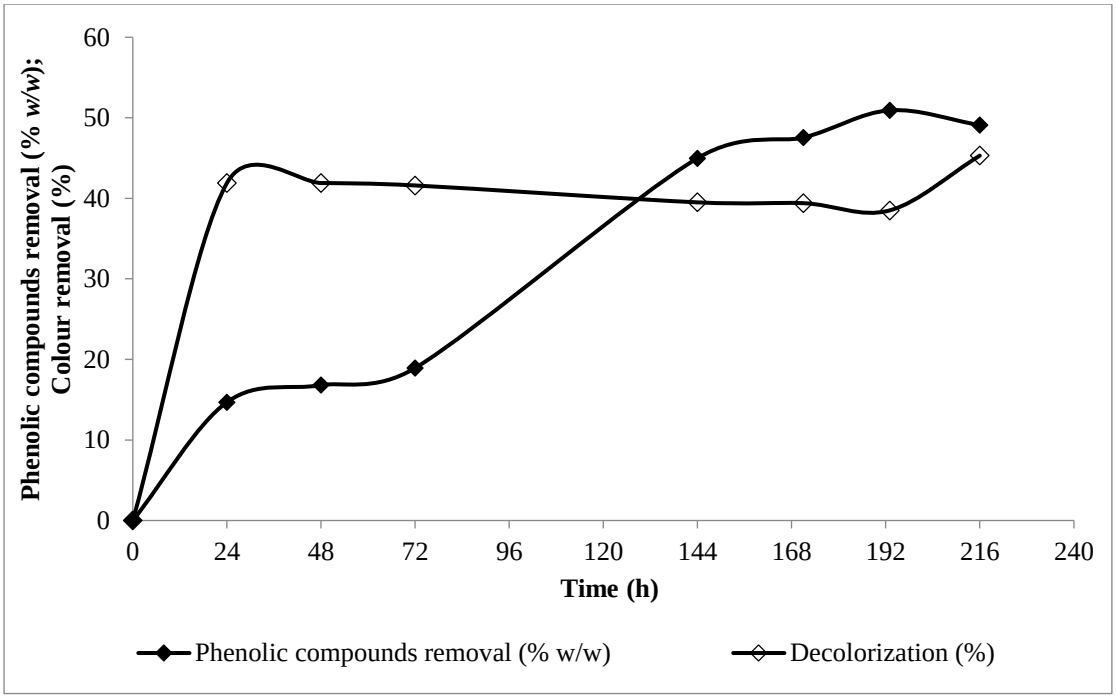


Fig. S4 Phenolic compounds removal (% *w/w*) and color removal (%) during growth of *Y. lipolytica* strain ACA-YC 5033 on OMW-based media enriched with commercial glucose, with initial phenolic compounds concentration 5.50±0.40 g/L in nitrogen limited media. Culture conditions as described in Fig. S1.