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Title: Aerated vs non-aerated conversions of molasses and olive mill wastewaters blends into bioethanol by Saccharomyces cerevisiae under non-aseptic conditions

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Source: INDUSTRIAL CROPS AND PRODUCTS **Volume:** 56 **Pages:** 83-93 **DOI:** 10.1016/j.indcrop.2014.02.040 **Published:** MAY 2014

Times Cited in Web of Science Core Collection: 15

Total Times Cited: 15

Usage Count (Last 180 days): 0

Usage Count (Since 2013): 10

Cited Reference Count: 77

Abstract: The ability of Saccharomyces cerevisiae MAK-1 to convert blends of molasses and olive mill wastewaters (OMWs) into compounds of higher added-value under aerated and non-aerated conditions was studied in the current investigation. Noticeable decolorization (up to 60%) and moderate removal of phenolic compounds (up to 28%, w/w) was observed. Under aerated conditions in non-sterile shake-flask cultures, cultures in molasses-based media in which supplementation with OMWs had been performed did not significantly decrease ethanol and biomass production in comparison with control experiments (cultures in which no OMWs had been added). Ethanol of 34.3 g L-1 (with simultaneous yield of ethanol produced per sugar consumed of similar to 0.40 g g(-1)) and biomass of 7.3 g L-1 (with yield of similar to 0.08 g g(-1)) was observed. Under similar aerated bioreactor cultures, biomass production (up to 5.7 g L-1 with yield of biomass produced per sugar consumed of similar to 0.07 g g(-1)) decreased while, on the other hand, ethanol biosynthesis was notably enhanced (up to 41.8 g L-1 with yield of ethanol produced of similar to 0.49 g g(-1) - value very close to the maximum theoretical one). Comparing non-sterile aerated with non-aerated bioreactor experiments, biomass production showed some slight increase and ethanol production slightly increased in the latter case. It is concluded that S. cerevisiae MAK-1 is a microorganism of importance amenable for simultaneous OMWs remediation and production of added-value compounds. (C) 2014 Elsevier B.V. All rights reserved.

Accession Number: WOS:000336018200011

Language: English

Document Type: Article

Author Keywords: Saccharomyces cerevisiae; Beet molasses; Olive-mill wastewaters; Bioethanol; Waste bioremediation

KeyWords Plus: CONTINUOUS ETHANOL-PRODUCTION; WATER-BASED MEDIA; YARROWIA-LIPOLYTICA STRAINS; CAROB POD EXTRACT; FED-BATCH CULTURE; WASTE-WATER; ZYMOMONAS-MOBILIS; ALCOHOL PRODUCTION; ACID PRODUCTION; BEET MOLASSES

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Publisher: ELSEVIER SCIENCE BV

Publisher Address: PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS

Web of Science Categories: Agricultural Engineering; Agronomy

Research Areas: Agriculture

IDS Number: AH3IZ

ISSN: 0926-6690

eISSN: 1872-633X

29-char Source Abbrev.: IND CROP PROD

ISO Source Abbrev.: Ind. Crop. Prod.

Source Item Page Count: 11

Funding:

Funding Agency	Grant Number
GSRT-Ministry of Higher Education and Religious Affairs	

The current investigation has been partly funded by the project entitled "Microbial conversions of agro-industrial residues into bio-fuels and other metabolites of biotechnological interest" (Bilateral S&T collaboration between Greece and Hungary, financed by GSRT-Ministry of Higher Education and Religious Affairs).

Open Access: No

Output Date: 2017-08-15

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