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Authors: Marco S. Nicolò, Maria G. Cambria, Giuseppe Impallomeni, Maria G. Rizzo, Cinzia Pellicorio, Alberto Ballistreri, Salvatore P.P. Guglielmino

PII: S1871-6784(16)32259-2
DOI: http://dx.doi.org/doi:10.1016/j.nbt.2017.05.013
Reference: NBT 981

To appear in:

Received date: 13-6-2016
Revised date: 19-4-2017
Accepted date: 31-5-2017

Please cite this article as: Nicolò, Marco S., Cambria, Maria G., Impallomeni, Giuseppe, Rizzo, Maria G., Pellicorio, Cinzia, Ballistreri, Alberto, Guglielmino, Salvatore P.P., Carbon source effects on the mono/dirhamnolipid ratio produced by Pseudomonas aeruginosa L05, a new human respiratory isolate.New Biotechnology http://dx.doi.org/10.1016/j.nbt.2017.05.013

Carbon source effects on the mono/dirhamnolipid ratio produced by *Pseudomonas aeruginosa* L05, a new human respiratory isolate

Marco S. Nicolò[a], Maria G. Cambria[a], Giuseppe Impallomeni[b], Maria G. Rizzo[a], Cinzia Pellicorio[a], Alberto Ballistreri[c], Salvatore P.P. Guglielmino[a*] sguglielm@unime.it

[a]Dipartimento di Scienze Chimiche, Biologiche, Farmaceutiche ed Ambientali, Università di Messina, v.le F. Stagno D'Alcontres 31, 98166 Messina, Italy

[b]Istituto per i Polimeri, Compositi e Biomateriali, Consiglio Nazionale delle Ricerche, via P. Gaifami 18, 95126 Catania, Italy.

[c]Dipartimento di Scienze del Farmaco, Università di Catania, viale A. Doria 6, 95125 Catania, Italy.

*Corresponding author: Guglielmino, S.P.P.

HIGHLIGHTS

- New strain *P. aeruginosa* L05 was able to produce rhamnolipids.
- The dirhamnolipids/monorhamnolipids ratio depended on the carbon source used.
- With long chain fatty acids up to 92 mol% monorhamnolipids were produced.
- ^{1}H NMR was used to measure the dirhamnolipids/monorhamnolipids ratio.
- Transcription of *rhlC* gene was delayed when fatty acids were used as substrate.

Abstract

Pseudomonas strains produce rhamnolipid mixtures (RLs) that generally consist of one or two molecules of rhamnose linked to one or two molecules of 3-hydroxyalkanoic acid. This study evaluates carbon source effects (glycerol, glucose, myristic acid, and *Brassica carinata* oil) on the synthesis of monorhamnolipids (mono-RLs) *versus* dirhamnolipids (di-RLs) in a human isolate of *Pseudomonas aeruginosa* PAL05. Spectrophotometry, an emulsifying index (E24) test, and an orcinol assay confirmed the production of RLs by PAL05. Purified RLs were characterized by ^{1}H NMR analysis. PAL05 primarily produces mono-RLs when provided carbon sources containing long chain fatty