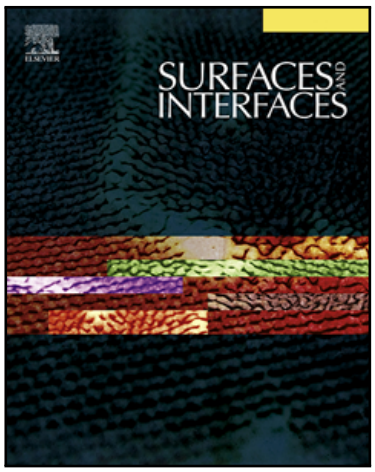

Physicochemical characterization of Pseudomonas aeruginosa isolated from catering substratum surface and investigation of their theoretical adhesion

K. Azelmad , F. Hamadi , R. Mimouni , A. El boulani , K. Amzil , H. Latrache

PII: S2468-0230(18)30227-X
DOI: 10.1016/j.surfin.2018.04.004
Reference: SURFIN 194

To appear in: *Surfaces and Interfaces*

Received date: 14 December 2016
Accepted date: 22 April 2018

Please cite this article as: K. Azelmad , F. Hamadi , R. Mimouni , A. El boulani , K. Amzil , H. Latrache , Physicochemical characterization of Pseudomonas aeruginosa isolated from catering substratum surface and investigation of their theoretical adhesion, *Surfaces and Interfaces* (2018), doi: 10.1016/j.surfin.2018.04.004

Physicochemical characterization of *Pseudomonas aeruginosa* isolated from catering substratum surface and investigation of their theoretical adhesion

K. AZELMAD[1], *F. HAMADI*[1*], *R. MIMOUNI*[1], *A. EL BOULANI*[1], *K. AMZIL*[1], *H. LATRACHE*[2].

[1] *Laboratory of Microbial Biotechnology and Vegetal Protection, University Ibn Zohr, Faculty of Science, department of biology, Postal Code 8106, Agadir, Morocco, 212528220957.*

[2] *Laboratory of Bioprocess and Biointerfaces, University Sultan Moulay Slimane, Faculty of Sciences and Techniques, department of biology, Postal Code 523, Beni-Mellal, Morroco, 212 523 48 51 12/22/82.*

[*]Corresponding author: ha_fatima@yahoo.fr.

ABSTRACT

The physicochemical properties of six *Pseudomonas aeruginosa* isolated from catering environment surface at a health establishment and of different types of substratum surfaces were investigated. These physicochemical properties were determined by contact angles measurements via sessile drop technique. The strains of *Pseudomonas aeruginosa* (P3, P14, and P18) were hydrophobic, the others were hydrophilic. The results show also that all strains were predominantly electron donors (γ^-) and weakly electron acceptors (γ^+). Three types of marble (yellow, white and black), four types of granite (Bleu-Pearl, Rosa-Porrino, Galaxy and Green-Pinhel), Corian, stainless steel 304 and polypropylene were studied. Except yellow marble and granite (Green-Pinhel) that classified as hydrophilic surfaces, the others were hydrophobic. The finding shows that yellow marble and Green-Pinhel granite were predominantly electron donating (γ^-) and other substratum surfaces were weakly electron donating. Except yellow marble which has a high electron acceptor, the others have a weak electron acceptor character. The free energy of adhesion between the bacteria and substratum surface was calculated and used in this study to predict the adhesion of *Pseudomonas aeruginosa* on the studied substratum surface. For all studied the substratum, except P18, the adhesion of all *Pseudomonas aeruginosa* is thermodynamically favorable only to polyethylene. Moreover P11 has the ability to adhere to all substratum surfaces.

Keywords: Physicochemical properties, food contacting surfaces, *Pseudomonas aeruginosa*, Predictive adhesion, Contact angle measurements.