

Article Abstract

Title:	Interaction of photosynthetic bacterium, <i>Rhodopseudomonas Palustris</i> , with montmorillonite clay
Author(s):	Yanbo Wang*, Jianzhong Han
Address(es):	Key laboratory of Food Safety of Zhejiang Province, Food Quality & Safety Department, Zhejiang Gongshang University, Hangzhou 310035, China *Corresponding Author: e-mail: wangyb@mail.zjgsu.edu.cn, Tel +86-571-8807-1024-8595
Journal:	<i>International Journal of Engineering, Science and Technology</i> , Vol. 2, No. 7, 2010, pp. 36-43.
Abstract:	In this study, we investigate the interaction of <i>Rhodopseudomonas Palustris</i> (<i>R. Palustris</i>) with montmorillonite clay. The adsorption of bacteria on the clay surface was also determined as a function of the initial bacterial quantity, pH, temperature and ionic strength. At different initial bacterial quantities, the percentage of bacteria adsorbed ranged from 61.07% to 77.57%, and the higher percentage was determined to be 15.0×10^8 cfu ml ⁻¹ . In addition, the actual number of adsorbed cells was significantly correlated with the initial quantity of <i>R. Palustris</i> . A greater degree of <i>R. Palustris</i> adsorption on the montmorillonite was observed in the temperature range of 30oC to 40oC. It was also found that as the pH and ionic strength increased the percentage of bacterial adsorption on montmorillonite decreased. There were no significant differences ($P > 0.05$) in the enzyme activities of aspartate aminotransferase (AST), alanine aminotransferase (ALT) and lactate dehydrogenase (LDH) between the bacteria treated with and without montmorillonite. However, montmorillonite supplementation significantly increased ($P < 0.05$) the cell surface hydrophobicity of <i>R. Palustris</i> compared with the control. These results indicated that the interaction was controlled by physicochemical characteristics between cells and the mineral substrate.
Keywords:	Montmorillonite; <i>R. Palustris</i> ; interaction; bacterial adsorption; clay