World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:11, No:04, 2017

Comparison of Methods for the Detection of Biofilm Formation in Yeast and Lactic Acid Bacteria Species Isolated from Dairy Products

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Abstract : Lactic acid bacteria (LAB) and some yeast species are common microorganisms found in dairy products and most of them are responsible for the fermentation of foods. Such cultures are isolated and used as a starter culture in the food industry because of providing standardisation of the final product during the food processing. Choice of starter culture is the most important step for the production of fermented food. Isolated LAB and yeast cultures which have the ability to create a biofilm layer can be preferred as a starter in the food industry. The biofilm formation could be beneficial to extend the period of usage time of microorganisms as a starter. On the other hand, it is an undesirable property in pathogens, since biofilm structure allows a microorganism become more resistant to stress conditions such as antibiotic presence. It is thought that the resistance mechanism could be turned into an advantage by promoting the effective microorganisms which are used in the food industry as starter culture and also which have potential to stimulate the gastrointestinal system. Development of the biofilm layer is observed in some LAB and yeast strains. The resistance could make LAB and yeast strains dominant microflora in the human gastrointestinal system; thus, competition against pathogen microorganisms can be provided more easily. Based on this circumstance, in the study, 10 LAB and 10 yeast strains were isolated from various dairy products, such as cheese, yoghurt, kefir, and cream. Samples were obtained from farmer markets and bazaars in Bursa, Turkey. As a part of this research, all isolated strains were identified and their ability of biofilm formation was detected with two different methods and compared with each other. The first goal of this research was to determine whether isolates have the potential for biofilm production, and the second was to compare the validity of two different methods, which are known as “Tube method” and “96-well plate-based method”. This study may offer an insight into developing a point of view about biofilm formation and its beneficial properties in LAB and yeast cultures used as a starter in the food industry.

Keywords : biofilm, dairy products, lactic acid bacteria, yeast
Conference Title : ICEAFS 2017 : International Conference on Environment, Agriculture and Food Sciences
Conference Location : Lisbon, Portugal
Conference Dates : April 16-17, 2017