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Letter to the Editor OMICS International

Dispersion in Biofilms Formed by Sporeforming Bacteria of Dairy Origin

Fadila Malek*

Department of Biology, University of Tlemcen, Tlemcen, Algeria

***Corresponding author:** Fadila Malek, Department of Biology Faculty SNV-STU, University of Tlemcen, Tlemcen 13000, Algeria, Tel: 043-411189; E-mail: malekfad@yahoo.fr

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Letter to the Editor

This letter is about the usefulness of non-submerged biofilms as a model for studying biofilm dispersal, with an emphasis on a novel dispersion style found in biofilms formed by dairy-associated bacteria.

Dispersion, defined as the release of planktonic cells, is the final stage of biofilm development and of major significance in clinical and industrial settings due to its importance in cross contamination and disease transmission [1,2]. Numerous papers were published in this field [1-5]. Although not completely elucidated, it is well established that mechanisms underlying biofilm dispersal rely mainly on enzymatic matrix degradation. In my recent study [6] devoted to the characterization of dairy biofilms *in vitro* and *in situ*, active dispersal in the way called central hollowing [7] as well as an original dispersion style not previously described, were found in non-submerged biofilms of mesophilic and themophilic spore forming bacteria. These biofilms were formed by monocultures of strains of *Bacillus cereus* and *Geobacillus* spp. of dairy origin in a simple and rapid way [8], and imaged in environmental scanning electron microscopy (ESEM). In the new dispersion style, planktonic cells were seen escaping from close compact biofilms, through small holes performed at the upper surface of the biofilm matrix. Unlike recognized dispersing mechanisms, this new strategy to escape from the biofilm appears not to rely upon biochemical matrix degradation, but on a physical process which consisted of piercing the matrix surface using well-defined geometrical sharped structures most likely of crystalline nature. This unnoticed mechanism of biofilm dispersal requires further investigations to be better understood.

Taking into account that biofilm dispersion has become an important topic research, these findings should constitute an interesting direction for further investigations aimed at characterizing unknown mechanisms involved in this process. A problem facing such research projects is how to induce planktonic life in a biofilm. It appears that non-submerged biofilms, as obtained using the microorganism carrier-surface method [8] are an efficient model that allows rapid dispersal and should be suitable for studying this phenomenon. Further work on the topic will improve our knowledge about mechanisms of biofilm dispersal in general and specifically, in lesser characterized biofilms of sporeforming bacteria notably those of thermophilic bacilli as important contaminants in the dairy industry.

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