Bacterial diversity was studied on biofilm samples collected on carbon steel at various immersion times. The quantitative variation with time of total population was monitored by epifluorescence microscopy. Then, the study was separated in two parts. On the one hand, cultured bacteria were isolated in aerobic and micro-aerobic conditions and identified by molecular biology. On the other hand, total bacterial diversity of the same biofilm samples were studied by TTGE (Temporal Temperature Gradient Gel Electrophoresis) focusing on a polymorphic region of 16SrDNA. The results obtained by culture and TTGE will be compared to determine the representativeness of the cultured bacteria in the total bacterial diversity in the biofilm and we will study their effect in the steel corrosion.

**Community interactions promote *Legionella pneumophila* survival in drinking water biofilms**

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*Legionella pneumophila* is a waterborne pathogen that can cause Pontiac Fever or Legionnaires’ disease, a type of pneumonia that can be fatal. Although *L. pneumophila* is not able to replicate in low nutrient environments, such as drinking water, it is known that heterotrophic biofilms have a crucial role in the survival of this pathogen in drinking water distribution systems. The aim of this work is to study the community interactions that influence the survival of *L. pneumophila* in biofilms. For that, mono and dual-species biofilms of *L. pneumophila* and the predominant biofilm isolates *Variovorax paradoxus*, *Mycobacterium chelonae*, *Acidovorax* spp., *Sphingomonas* spp., were formed on PVC surfaces and sessile cells quantified for total cells, viable and cultivable *L. pneumophila* and cultivable non-*Legionellae*. Results demonstrated that *Acidovorax* spp. and *Sphingomonas* spp. appear to have an antagonistic effect on *L. pneumophila* cultivability but not in the viability, leading to the formation of viable but noncultivable (VBNC) cells, while *M. chelonae* increased the cultivability of this pathogen. *M. chelonae* is one of the microorganisms commonly found in drinking water and this work demonstrates that this strain is able to promote *L. pneumophila* survival in these systems. It is also demonstrated that other species might stimulate this pathogen to enter a VBNC state and consequently be underestimated in the drinking water quality control, as drinking water safety assessment still relies on standard culture techniques. It is essential for future work to study other biofilm community members to understand their ecological interactions with *L. pneumophila*.

**The Inclusion of Anaerobic Isolates in Multispecies Continuous Culture Biofilm Model Systems Grown Under Aerobic Conditions for Evaluation of Treatment Efficacy**

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**Number:** 75

Naturally occurring biofilms usually contain multiple species. Single species models have provided crucial data regarding the nature and treatment of biofilms. However, interactions within multispecies biofilms affect community physiology and metabolism which may impact treatment efficacy. Anaerobic species have been shown to be present in biofilms on infected devices and in chronic wounds. The development of a multispecies in vitro model which includes anaerobes can be complicated, requiring the detection of all test species in order to confirm their presence within the biofilm and to evaluate treatment efficacies. We have developed continuous culture multispecies models which include anaerobic species grown in biofilms under aerobic conditions. The nine species dental model, grown in the Drip Flow Reactor (DFR) at 37°C, is inoculated with five facultative anaerobic species first followed by inoculation with four strict anaerobic species three days later. The three species wound model, grown in the ColonyDFR, is inoculated simultaneously with *Clostridium perfringens*, *Pseudomonas aeruginosa* and *Staphylococcus aureus*. The two species device infection model, grown in Sorbarod filters, is inoculated simultaneously with *Propionibacterium acnes* and *Staphylococcus epidermidis*. In all three model systems, anaerobic species are grown anaerobically but are inoculated into the model system under aerobic conditions. Confirmation of species present in these model biofilms was performed using selective plating; counts ranged from $10^5$ to $10^{10}$ CFU/cm² with run to run repeatability. Whole and cyrosectioned biofilms were microscopically imaged. Treatments showed different efficacy based on species indicating that these models can provide valuable information regarding treatment efficacy in multispecies biofilms.

**Effect of salinity on the biological activities and the biodiversity of a summed filter bioreactor for the treatment of urban waste waters**

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**Number:** 76

The presence of salinity in urban waste-waters may affect in a significant manner the good function of the summed-filter biological reactors due to the effect of high salt concentrations on the structure and biodiversity of the microbial biofilms responsible of the depurative process.