

TITLE: EFFECTS OF THE USE OF BACTERIOPHAGES THAT INFECT *ESCHERICHIA COLI* OVER THE BACTERIAL POPULATION CULTIVATED IN MEDIUM FOR ENRICHMENT OF SULPHATE REDUCING BACTERIA

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ABSTRACT:

Sulphate Reducing Bacteria (SRB) are anaerobic organisms that uses the sulphate as final electron acceptor, and produces H₂S gas as a byproduct of this metabolism. In petroleum-related environments, these microorganisms cause substantial damage once the presence of H₂S, besides being toxic for workers, also decreases the quality of the petroleum by a process called *souring*, which acidifies the environment and intensifies corrosive processes within the platforms. In this context, the use of bacteriophages as bioremediators of such organisms arise as an interesting alternative of control, once its production is economically more viable than the use of antibiotics, and it is not toxic to the environment. Our goal is to evaluate the effect of nonspecific bacteriophages over the population of prokaryotes in a specific growing medium for enrichment of SRB, in a pilot scale. For this purpose, samples from different oil platforms were cultivated under enrichment medium (Postgate C). Then, for determining the behavior of these organisms, we used a continuous flow system in anaerobiosis to simulate what happens in the field. The cultures were inoculated and aliquots removed for analysis. The DNA found at the biofilm were extracted and sent to sequencing, with the purpose to evaluate, both qualitatively and quantitatively, the organisms from those samples. We identified 233 bacterial species within the system, which of 93 had representative populations. The addition of phages affected the bacterial communities in different ways. The most impacted phyla were Firmicutes and Proteobacteria, which are the most abundant ones, and that include most of SRB groups. Besides that, the most abundant order and also the most affected one, was the Deltaproteobacteria, the main order of SRBs. The prevalence of genera that produces H₂S in the community indicates that the enrichment medium was effective. In general, the inoculation of phages affected the populations in distinct ways, and approximately 17% of populations had their abundance decreased, including species from the genus *Desulfomicrobium*, which can reduce sulphate.

Keywords: SRB, Bioremediation, Phages;

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