XVII Congreso Argentino de Microbiología General

Sociedad Argentina de Microbiología General
SAMIGE

25 al 28 de octubre del 2022
HOTEL UTHGRA
Los Cocos
Córdoba
Argentina

values (39%, 27% and 24%, respectively) after DBT exposure. Particularly, *Pseudomonas* sp. P26 stood out for a 35-fold increase in biofilm formation in the presence of DBT together with a high DBT removal capacity (48%). The results obtained demonstrate that the microbial physiological properties evaluated represent valuable tools to optimize the microbial removal process and therefore bioremediation can be an effective alternative for DBT removal.

BB14-CHARACTERIZATION OF BIOSURFACTANTS PRODUCED BY HYDROCARBON-DEGRADING *Pseudomonas* SP. KA-08

Zangari CA[1], Kolender A [3,4], Raiger Iustman, LJ.[1,2]

1) IQUIBICEN-CONICET - 2) Dpto de Química Biológica. Facultad de Ciencias Exactas y Naturales. UBA - 3) Dpto de Química Orgánica. Facultad de Ciencias Exactas y Naturales. UBA - 4) CIHIDECAR-CONICET-UBA

Hydrophobic compounds bioavailability is a key factor for their biodegradation and mobilization. Because of that, the use of surfactants was proposed as additives in Surfactant Enhanced Remediation (SER) and in Surfactant Enhanced Oil Recovery (SEOR). The use of biosurfactants instead of the synthetic ones have some environmental advantages like less toxicity and higher biodegradability, that make these biomolecules an environmentally friendly alternative. Previous studies from our group showed that *Pseudomonas* sp. KA-08 was able to secrete biosurfactants to the culture media when it grew in kerosene as sole carbon source and a crude extract surfactant (CES) could be obtained from a cell-free supernatant of these cultures. In this work we analyzed the surface tension lowering capabilities of the different compounds present in the CES and their chemical composition.
Pseudomonas sp. KA-08 was cultured in 50 ml E2 minimum medium supplemented with 10% kerosene in 500 ml capped bottles at 280 rpm and 30°C. After 7 days, cultures were centrifuged at 3500 rpm for 20 minutes, the oil phase was removed and supernatants were acidified up to pH 2 and left overnight at 4°C. Then, they were extracted thrice with half the volume of ethyl acetate and concentrated to dryness by Rotavap to obtain the CES. To calculate its critical micelle concentration (CMC) a Du Nouy ring method was used, obtaining a CMC = 670 µg/ml ± 76 µg/ml. For better characterization of the CES components, a silica gel chromatographic column (diameter: 1,50cm, length: 40cm) was performed using solvents in increasing order of polarity as elutants, in order to separate the compounds for further analysis. The elution fractions were collected, analyzed by TLC and revealed with UV light or Molisch reagent. The fractions who showed unique spots with a conserved Rf were grouped, obtaining 4 pooled fractions. Each pool was evaporated to dryness, resuspended in bidistilled water and tested by the drop-collapse method. Three of them showed a contact angle dismitution of 10° ± 3°, 18° ± 4° and 18° ± 3° respectively. The predominant one, who showed positive for Molisch reagent (glycosidic nature) was analyzed by ^{1}H and ^{13}C-NMR spectroscopy and exhibited complex spectra with aliphatic and aromatic moieties.
This work allows us to continue the chemical analysis of the compound purified and to study the potential use of the CES as a biosurfactant additive in microcosms polluted with hydrocarbons.

BB15-FURFURAL REMOVAL FROM LIQUID SYSTEMS BY ACTINOBACTERIA

Echeverría MC[1], *Benimeli CS* [2,3]

1) Grupo de Investigación Sobre Temas Ambientales y Químicos (GISTAQ), Facultad Regional Resistencia, Universidad Tecnológica Nacional, Resistencia, Chaco, Argentina. 2) Planta Piloto de Procesos Industriales Microbiológicos (PROIMI-CONICET), San Miguel de Tucumán, Tucumán, Argentina. 3) Facultad de Ciencias Exactas y Naturales, Universidad Nacional de Catamarca, San Fernando del Valle de Catamarca, Catamarca, Argentina, Argentina

Many industries such as petrochemical, pulp and paper, pharmaceutical, and food industries involve processes that use or produce furfural. Furfural is a heterocyclic aldehyde obtained by dehydrating at high temperatures of xylose; therefore, it is a characteristic compound present in acid hydrolyzates in which the furfural concentration can usually reach 2–3 g l^{-1}. In the region Northeast of Argentina (NEA), furfural is produced from detanized quebracho sawdust. In NEA, wastewaters derived from furfural production contain around 800 mg l^{-1} of this compound, which can cause toxic effects on living systems if they are released into the environment without proper treatment. In the present work, the removal of different concentrations of furfural by actinobacteria from liquid systems was studied. Isolates of actinobacteria called L4, L6, L9 and L13 obtained from sediments of stabilization ponds of a furfural-producing plant in the NEA region, and *Streptomyces* sp. A5, A6, A12, A14 and M7, obtained from sites contaminated with other xenobiotic compounds, were selected on base of their tolerance to furfural in Starch Casein Agar medium. In order to select the most efficient actinobacteria with respect to their growth and furfural removal ability in liquid medium, Minimal Medium (MM) added with a furfural concentration of 418±1 mg l^{-1} as the only carbon and energy source was used. This selection was carried out by determining the minimum relationship between the concentration of residual furfural and the microbial growth. *Streptomyces* sp. A12 and M7 and strain L9 were selected because they showed the minimal relationship. Subsequently, the selected strains, as pure and mixed cultures, were inoculated in MM supplemented with furfural 807±10 mg l^{-1} as the only carbon and energy source. The results showed that the three pure cultures were able to grow and develop under these conditions; however, the culture for which the relationship mentioned above was minimal, was the consortium formed by the actinobacteria L9, A12 and M7. In order to evaluate the effectiveness of the bioremediation process, ecotoxicity tests were carried out using *Raphanus sativus* seeds (radish, Punta Blanca variety). The culture supernatants were evaluated before and after its treatment for each condition. In response, inhibition of germination and elongation of the radicle and hypocotyl were determined in the presence of furfural. Significant increases in these bioindicators ($p < 0.05$) were obtained when the treatment was carried out with the consortium formed by the actinobacteria L9, A12 and M7. The results obtained suggest that the selected actinobacteria consortium represents a promising bioremediation tool for the treatment of effluents containing furfural.

BB16-BIOREMEDIATION OF LINDANE AND CHROME (VI) CO-CONTAMINATED SOILS BY BIOAUGMENTATION WITH AN INDIGENOUS CONSORTIUM OF ACTINOBACTERIA

Bigliardo AL[1] , *Benimeli CS* [1,2] , *Polti MA* [1,3]

1) Planta Piloto de Procesos Industriales Microbiológicos (PROIMI-CONICET), San Miguel de Tucumán, Tucumán, Argentina. 2) Facultad de Ciencias Exactas y Naturales, Universidad Nacional de Catamarca, San Fernando del Valle de Catamarca, Catamarca, Argentina. 3) Facultad de Ciencias Naturales e