Enhanced Corrosion of 7075 Alloy by the Presence of *Bacillus megaterium*

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A *Bacillus megaterium* strain with corrosive properties was isolated from a bacterial community collected from the drain valve of a C130 aircraft principal fuel tank. This strain and the consortium present in the valve were studied microbiologically and electrochemically to evaluate the risk of corrosion. Aluminum alloy 7075 was used as a substrate and the corrosion behavior was studied in sterile minimal salt medium (MSM) as a function of immersion time. The isolation and characterization of the consortium by DNA sequencing showed that the bacterium with corrosive properties is closely related to *B. megaterium*. Electrochemical results revealed that the corrosion rate was not influenced in sterile and inoculated media with the consortium. However, a corrosive behavior was determined in presence of the isolated *B. megaterium* strain after 14 days immersion time. The effect might be related to interfacial local pH changes by oxygen reduction to OH⁻ ions. Further, SEM examinations and EDX analysis of metallic samples exposure in inoculated media showed localized attacks.

Keywords: microbiologically influenced corrosion, biocorrosion, aluminum alloy, 7075, *Bacillus megaterium*

FULL TEXT

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