

CHARACTERIZATION OF MICRO-ORGANISMS ISOLATED FROM METALLIC SURFACES AT BRAZIL LARGEST HYDROELECTRIC AND BIOFILM CONTROL STRATEGIES

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Tucuruí's power plant is the largest exclusively Brazilian hydroelectric facility. Conditions favor biofilm formation and Microbially Influenced Corrosion (MIC), due of its geographic location and reservoir formation. MIC can be described as the change of electrochemical potential at the interface metal/solution, caused by metabolites produced by bacteria and fungi growing in metallic surfaces as biofilms. The knowledge of biofilms' microbiota allows us to choose the best biocide to reduce the effects of MIC. Polyphasic approach, consisting in associate morphological, chemical and genetical techniques, is interesting for the correct characterization of micro-organisms. The aim of this work were the isolation and the polyphasic identification of micro-organisms present in metallic coupons installed in Tucuruí's Power Plant (PA), and the evaluation of the best biocide to be used for the control of biofilm formation. Samples were collected every two months during 2011 and 2012, and micro-organisms were identified by macro and micromorphology, biochemical assays and molecular tools. The efficiency of biocides Orobor, MXD-100 (MaxClean[®]), sodium hydroxide, *Schinus terebinthifolius* extract and *Ilex paraguariensis* extract were tested by microdilution. Data were analyzed by ANOVA ($p < 0.01$) followed by Scott-Knott test for comparison of means ($p < 0.05$). It was isolated aerobic or facultative anaerobic bacteria (358 isolates), belonging mostly to the genera *Bacillus*, sulfate-reducing and iron-oxidizing bacteria, in addition of fungi (94 isolates), with prevalence of the genera *Penicillium*. MXD-100 1 ppm and 3 ppm, Orobor 10 mL/L and NaOH pH 14 were the most efficient biocides, reducing up to 35% of bacteria and fungi tested. The characterization of micro-organisms from metal surfaces highlights the North of Brazil biodiversity and can be related to the process of biocorrosion, enabling the development of new strategies for its control.

Key words: Biofilm, biocorrosion, biocide, antimicrobial agent