COMPARISON BETWEEN DIFFERENT STAGES OF THE MANUFACTURING PROCESS IN AN IMPLANT INDUSTRY USING ECOTOXICOLOGICAL BIOASSAYS

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INTRODUCTION: Industrial effluents, especially when discharged into water bodies without proper treatment, contribute to the degradation of aquatic resources. One example is the metallic implant manufacturing industry, which generates different types of effluents across its various production stages. If not properly treated, these residues can be highly harmful. Therefore, it is important the understanding of how each production stage contributes individually for aquatic ecosystems impact. **OBJECTIVE:** This study aimed to evaluate the ecotoxic profile of effluents generated separately from the Machining, Anodizing, and Finishing stages from a small-sized Brazilian metallic implant industry using two bioindicators. **MATERIALS AND METHODS:** The effluents were collected in October 2024 and are typically characterized by high concentrations of metals, surfactants, oils, greases, and alkaline pH. The ecotoxicological evaluation was conducted using the microalgae *Pseudokirchneriella subcapitata* and the microcrustacean *Daphnia magna*. The algal growth inhibition was assessed at concentrations ranging from 50% to 3.12% diluted in Chú medium, which was also used as the negative control. Absorbance readings at 750 nm were taken between 24 and 72 hours. In acute toxicity assays with *D. magna*, 20 individuals per group were exposed to effluent concentrations from 50% to 0.39%, with a standard culture medium as the negative control, following ABNT NBR 12713/2016. **RESULTS AND CONCLUSION:** Results showed that 6.45% of the Machining effluent inhibited algal proliferation after 72 hours. Anodizing and Finishing effluents did not show toxicity to *P. subcapitata*. For *D. magna*, the Machining effluent was lethal at just 1.56%, while Anodizing caused lethality at 6.25%, and Finishing effluent was fully toxic at 3.12%. These findings indicate that the Machining effluent is the most toxic in both bioassays, while the Anodizing showed lower toxicity. The results highlight the importance of separate management and disposal of effluents from different production stages in metallic implant manufacturing.

Key Words: *Dapnhia magna*, *Pseudokirchneriella subcapitata,* Industrial effluents