Bioactive Catheter to Prevent Systemic Infection Using Cashew Nut Shell Liquid (CNSL)

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Catheters are the most used devices in treating hospitalized patients and in hemodialysis procedures. However, its use represents a potential risk for blood infections (possibly sepsis or septicemia). Staphylococcus aureus, the most common microorganism found in blood culture from patients with blood infection is resistant to many antibiotics. On the other hand, the cashewnut shell liquid (CNSL) that is a byproduct of the cashewnut industry contains anacardic acid, which is known by its antimicrobial effect against S. aureus. CNSL has a high polymeric potential, with a low production cost. Therefore, I intended to use the CNSL to produce a bioactive catheter that can prevent septicemia. The polymer was produced mixing 1 mL of castor oil polyurethane (PU) plus 0.25 mL of CNSL during two minutes at room temperature. It was shaped in a homemade mold, dried for three hours and then removed from the mold. The produced polymer was tested for physical-chemical properties and antimicrobial properties. Microbial quantification, antibiogram, autoclave sterilization, permeability, absorbance, x-ray diffraction, wettability and resistance tests were performed. The produced polymer showed standard results in resistance, impermeability, wettability and X-ray diffraction and also showed no growth of S. aureus in any of its surface during the antimicrobial tests. These tests show that it is possible to produce a bioactive catheter using CNSL with potential to prevent septicemia.

Awards Won:

Fourth Award of $500

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