PÔSTER - RESUMO - MATERIAIS E BIOMATERIAIS

ELECTROSPUN POLY(E-CAPROLACTONE) AND POLY(N-VINYL-2-PYRROLIDONE) MATS CONTAINING BIOACTIVE COMPOUNDS FROM RED PROPOLIS AND CURCUMA LONGA L.

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The search for biomaterials with therapeutic properties has been a growing field of research, particularly in the development of functional dressings that promote wound healing and infection prevention. In this study, electrospun mats were developed from blends of poly(e-caprolactone) (PCL) and poly(N-vinyl-2-pyrrolidone) (PVP), incorporating bioactive compounds from red propolis and Curcuma longa L. to promote antibacterial activity and accelerate the healing process. The characterization of the extracts revealed high levels of bioactive compounds, with red propolis presenting 231.3 mg GAE/g of total phenols, 31.8 mg QE/g of flavonoids, and an antioxidant capacity of 90.29% according to the DPPH radical assay, while Curcuma longa L. exhibited 42.4 mg GAE/g of phenols, 13.6 mg QE/g of flavonoids, and an antioxidant capacity of 58.46%, indicating the potential of these compounds to neutralize free radicals. Minimum

inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) tests demonstrated that the extracts were effective mainly against Gram-positive pathogens and that the electrospun polymeric matrices enhanced their inhibitory capacity. The mats were produced by electrospinning, resulting in microfibers with an average diameter of 1.79 μm, as observed by Scanning Electron Microscopy (SEM). Interactions between the bioactive compounds and the polymer matrix were analyzed using Fourier Transform Infrared Spectroscopy (FTIR), while thermal properties were evaluated by Thermogravimetric Analysis (TGA) and Derivative Thermogravimetric Analysis (DTG), indicating immiscibility of the blends. Mechanical testing showed that the incorporation of PCL increased the strength of PVP, improving the overall mechanical performance of the biomaterial. Wettability tests revealed that the addition of PVP reduced the hydrophobicity of the blends, increasing their hydrophilicity even in the presence of the functional compounds, and release studies demonstrated an initial burst release of bioactive compounds during the first hours. Overall, the results indicate that the developed electrospun mats exhibit promising properties for application as functional dressings, with the potential to enhance wound healing and prevent infections.

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Palavras-chave: polycaprolactone; polyvinylpyrrolidone; red propolis; curcuma longa l; electrospinning; wound dressings.