

SYNTHESIS AND CHARACTERIZATION OF HYDROGELS LOADED NEOMYCIN FOR INFECTION TOPIC TREATMENT AND VETERINARY USE

ABSTRACT

Hydrogels are natural or synthetic polymer systems that have been vastly applied in the pharmaceutical industry due to their high soft tissue biocompatibility. These hydrogels have been used in dressings as a controlled drug release system. In this study, hydrogels were prepared using poly (N-vinyl-2-pyrrolidone) (PVP), poly (ethylene glycol) (PEG), agar and neomycin followed by gamma irradiation to promote crosslinking and sterilization. The influence of the irradiation process at 25 kGy dose was investigated. The gel fraction and maximum swelling were estimated using physicochemical methods and found about 95% gel fraction and 1100% swelling after 8 hours of immersion. Neomycin released from the hydrogel was measured by the Liquid Chromatography-Mass Spectrometry method and the drug concentration remained constant for 48 hours. Hydrogel / neomycin exhibited antibacterial effect against bacteria and biofilm of *Pseudomonas aeruginosa* and *Staphylococcus aureus*. The hydrogel was used in the treatment of pododermatitis in penguins healing process without signs of contamination. With these results, it can be inferred that the hydrogel / neomycin is a suitable candidate for wound dressings.

Keywords - hydrogel, gamma irradiation, drug-controlled release system, antimicrobial, antibiotic-resistant bacteria, penguins, pododermatitis