

## Physicochemical Attributes of Pectin Hydrogel and Its Wound Healing Activity

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**Abstract :** The physicochemical attributes and wound healing activity of pectin hydrogel in rat models, following partial thickness thermal injury were investigated. The pectin hydrogel was prepared by solvent evaporation method with the aid of glutaraldehyde as crosslinking agent and glycerol as plasticizer. The physicochemical properties were mainly evaluated using differential scanning calorimetry (DSC) and Fourier transform infrared (FTIR) spectroscopy, while the wound healing activity was examined by the macroscopic images, wound size reduction and histological evaluation using haematoxylin and eosin (H&E) stain for 14 days. The DSC and FTIR analysis suggested that pectin hydrogel exhibited higher extent of polymer-polymer interaction at O-H functional group in comparison to the unprocessed pectin. This was indicated by the increase of endothermic enthalpy values from  $139.35 \pm 13.06$  J/g of unprocessed pectin to  $156.23 \pm 2.86$  J/g of pectin hydrogel, as well as the decrease of FTIR wavenumber corresponding to O-H at  $3432.07 \pm 0.49$  cm<sup>-1</sup> of unprocessed pectin to  $3412.62 \pm 13.06$  cm<sup>-1</sup> of pectin hydrogel. Rats treated with pectin hydrogel had significantly smaller wound size (Student's t-test,  $p < 0.05$ ) when compared to the untreated group starting from day 7 until day 14. H&E staining indicated that wounds received pectin hydrogel had more fibroblasts, blood vessels and collagen bundles on day 14 in comparison to the untreated rats.

**Keywords :** pectin, physicochemical, rats, wound

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