## *ABSTRACT*

*Curcumin is a bioactive compound with antioxidant, anti-inflammatory, and anticancer properties, yet its therapeutic use is limited due to poor solubility and low stability under physiological conditions. Molecularly Imprinted Polymers (MIPs) offer a promising approach to improve curcumin stability and enable controlled drug release. This study aimed to synthesize, characterize, and evaluate curcumin-loaded MIPs prepared via precipitation polymerization, as well as to assess their wound-healing efficacy. MIPs were synthesized using methacrylic acid (MAA) as the functional monomer, ethylene glycol dimethacrylate (EGDMA) as the crosslinker, and benzoyl peroxide (BPO) as the initiator in acetonitrile. Characterization was performed by Scanning Electron Microscope-Energy Dispersive X-Ray (SEM-EDX) to analyze morphology and elemental composition, and Fourier Transform Infrared Spectroscopy (FTIR) to confirm functional groups. In vitro release studies were conducted using a Franz diffusion cell in phosphate buffer (pH 7.4), while in vivo wound healing tests were performed in mice using the excision wound model. MIPs obtained through precipitation polymerization exhibited fine spherical powder morphology with uniform particle distribution, predominantly composed of carbon and oxygen. FTIR spectra confirmed the presence of carbonyl (C=O) and -C–O groups derived from MAA and EGDMA. In vitro release experiments showed that after 8 hours, MIPs released 25.21% of curcumin, slightly higher than NIPs at 23.98%. In vivo findings demonstrated that MIPs accelerated wound healing, as indicated by smaller wound diameters and higher healing percentages. These results suggest that curcumin-based MIPs hold strong potential as sustained-release transdermal drug delivery systems.*



***Keywords**: Curcumin, Molecularly Imprinted Polymer, Precipitation Polymerization, Drug Release, Wound Healing*