

## ABSTRACT

Curcumin is the main polyphenol compound found in the rhizome of *Curcuma longa* with broad pharmacological activities, including anti-inflammatory, antioxidant, and anticancer. However, the use of curcumin is still limited due to its low bioavailability due to poor water solubility, suboptimal gastrointestinal absorption, and rapid metabolism and elimination. Therefore, a drug delivery system is needed that can increase the solubility, stability, and retention of curcumin in the body. This study developed a Molecularly Imprinted Polymer (MIP)-based delivery system with carboxymethyl chitosan (CMC) as a polymer matrix, ethylene glycol dimethacrylate (EGDMA) as a cross-linking agent, and benzoyl peroxide (BPO) as an initiator. MIP synthesis was carried out through the bulk polymerization method with curcumin as a template molecule. Characterization was performed using Fourier Transform Infrared Spectroscopy (FTIR) for functional group identification and Scanning Electron Microscope-Energy Dispersive X-Ray (SEM-EDX) for particle morphology analysis. Performance evaluation included adsorption tests with varying weight and concentration, in vitro release using Franz diffusion cells in phosphate buffer pH 7.4, and in vivo tests on a mouse excision wound model. The test animals were divided into four groups: P0 (negative control), P1 (povidone iodine), P2 (MIP-curcumin), and P3 (NIP-curcumin). The results showed that the adsorption capacity of MIP (2.589 mg/g) was higher than that of NIP (1.438 mg/g) based on the Langmuir isotherm. The in vitro release test showed that the release of curcumin from MIP was more controlled (40.48%) compared to NIP (48.71%). The in vivo test showed that MIP provided the most optimal wound healing with a smaller wound diameter compared to the NIP and control groups. Thus, carboxymethyl chitosan-based MIP-curcumin has the potential to be developed as a transdermal drug delivery system with controlled release and better pharmacological effectiveness.

**Keywords:** curcumin, Molecularly Imprinted Polymer (MIP), carboxymethyl chitosan, controlled release, transdermal.