

Characterization of Bioactive Compounds and Novel Proteins Derived from Promising Source *Citrullus colocynthis* along with In-Vitro and In-Vivo Activities

ABSTRACT

Herbal products are preferable to synthetic medicines, and the use of traditional medicines is increasing day-by-day. The current study was designed to evaluate the potentials of bioactive compounds from *Citrullus colocynthis* by performing FTIR, HPLC, and GC-MS analyses, which explore the good concentration of the secondary metabolites, such as gallic acid (74.854 ppm), vanillic acid (122.616 ppm), and ferulic acid (101.045 ppm) with considerable bioactivities. Antimicrobial protein was estimated by performing SDS-PAGE, ranging from 15 to 70 kDa in all protein fractions. The current study also checked the cytotoxicity of the bioactive compounds in the active fraction of *C. colocynthis*, and to perform this activity, the groups of rats were arranged with 16 rats randomly divided into four groups (three experimental and one control) by administering various dosage of methanolic fractions in dose-dependent manner. Histopathology was conducted on the livers of the rats after 15 days of sacrifice under deep anesthesia. In liver cell slides examined at the maximum dose of 600 mg/kg, minimal morphological changes, such as slight ballooning, nuclear variation, vacuolar degeneration, and hydropic degeneration, were observed. Furthermore, the in silico analysis identified bioactive compounds as potential drug candidates.