

In vitro evaluation of scavenging and anti-adipogenic activity of *Momordica cochinchinensis* (Lour). Spreng fruit extracts on 3T3-L1 adipocytes

ABSTRACT

Gac fruit, scientifically known as *Momordica cochinchinensis* (Lour) Spreng, is rich in potent bioactive compounds, particularly carotenoids such as β -carotene, lycopene, and lutein. This study investigated the effects of gac fruit extract fractions (peel, pulp, and aril) on the scavenging, cytotoxic, and anti-adipogenic activities in 3T3-L1 adipocytes. The study assessed the DPPH radical scavenging activity of gac extracts through serial dilution at a concentration of 1000 $\mu\text{g/mL}$. The viability of 3T3-L1 preadipocytes was measured using the MTT assay. Differentiated adipocytes were treated with gac extracts at concentrations of 75, 150, and 300 $\mu\text{g/mL}$ for 7 days. The impact on lipid accumulation and adipogenesis inhibition was determined through Oil Red O staining and triglyceride content analysis. The IC₅₀ values for DPPH radical scavenging were 573.40 $\mu\text{g/mL}$ for peel, 525.46 $\mu\text{g/mL}$ for pulp, and 817.33 $\mu\text{g/mL}$ for aril extracts. No toxicity was observed in 3T3-L1 cells at concentrations up to 200 $\mu\text{g/mL}$. At 200 $\mu\text{g/mL}$, gac extracts reduced 3T3-L1 cell viability while promoting growth and proliferation. Treatment with gac extracts significantly reduced lipid accumulation and inhibited 3T3-L1 cell differentiation in a dose-dependent manner. Among the gac extract fractions, pulp notably decreased intracellular triglyceride content in adipocytes, surpassing aril and peel extracts. In conclusion, gac fruit extract fractions (peel, pulp, and aril) effectively inhibited adipogenesis in 3T3-L1 adipocytes, as evidenced by reduced lipid accumulation, triglyceride content, and cell viability. These findings unveil valuable insights into bioactive compounds from *Momordica cochinchinensis* and their potential for addressing obesity prevention and treatment.