Abstract

Obesity is a major global health concern associated with increased risks of metabolic disorders, including type 2 diabetes, cardiovascular disease, and certain cancers. Glucomannan, a water-soluble dietary fiber abundantly found in porang (*Amorphophallus muelleri*), has attracted considerable attention due to its potential health-promoting properties. This study aimed to characterize and quantify porang glucomannan extract (PGE) and evaluate its effects on cell viability and lipid accumulation in 3T3-L1 cells. PGE was extracted using ethanol maceration and characterized using FTIR Spectroscopy, while glucomannan content was determined through the 3,5-DNS colorimetric assay. Cell viability was assessed using the WST-8 assay, and intracellular lipid accumulation was evaluated with Oil Red O staining. FTIR analysis confirmed the presence of characteristic glucomannan functional groups and β-glycosidic linkages consistent with previously reported glucomannan spectra. DNS analysis demonstrated that the extract contained a considerable proportion of glucomannan, indicating successful extraction of glucomannan from porang. PGE exhibited no cytotoxic effects toward 3T3-L1 preadipocytes, with cell viability remaining above 95% across all tested concentrations (62.5–500 µg/mL) and showing no significant difference compared with the untreated control ($p > 0.05$). In contrast, PGE significantly reduced intracellular lipid accumulation in differentiated 3T3-L1 adipocytes in a dose-dependent manner, with all treatment concentrations exhibiting significantly lower lipid accumulation than the control ($p < 0.0001$).These findings suggest that porang glucomannan extract exhibits positive anti-adipogenic effects while maintaining cell viability, highlighting its potential application as a functional food ingredient for obesity management.

Keywords: *porang, glucomannan, adipogenesis, lipid accumulation.*