



Conceptual Feasibility and Evaluation of Manno-Oligosaccharides Derived from Konjac in Skincare Formulations

Wasinee Phiromruk*¹, Panita Surachaikulwattana² and Chaleeda Borompichaichartkul³

¹Technopreneurship and Innovation Management Program, Graduate School, Chulalongkorn University, Bangkok 10330, Thailand

²Faculty of Commerce and Accountancy, Chulalongkorn University, Bangkok 10330, Thailand

³Faculty of Science, Chulalongkorn University, Bangkok 10330, Thailand

*Corresponding author, E-mail: 6581033420@student.chula.ac.th

Abstract

This study investigates the conceptual feasibility and preliminary functional performance of manno-oligosaccharides (MOS) derived from *Amorphophallus konjac* for potential application in skincare products. The research integrates bibliometric evidence with an experimental assessment of the short-term moisturizing efficacy of a topical formulation. A bibliometric knowledge-mapping analysis of studies related to konjac glucomannan highlights the polysaccharide's chemical structure and its prebiotic mechanism of action, indicating the potential to support skin microbiome balance and reinforce the skin barrier. Based on these properties, MOS was incorporated into a gel-cream formulation and its short-term moisturizing effect was evaluated on human volunteers using instrumental analysis. Its performance was compared with a base gel and a formulation containing sodium hyaluronate. Statistical analysis was conducted using repeated-measures analysis, with significance set at $p < 0.05$. The results demonstrated that the MOS-containing formulation significantly increased skin hydration compared to the base gel and maintained improved moisture levels for up to 90 minutes after application. Furthermore, the moisturizing efficacy of MOS was not significantly different from that of the sodium hyaluronate formulation. In conclusion, these findings confirm both the conceptual feasibility and functional effectiveness of konjac-derived MOS as a moisturizing ingredient in skincare formulations, supporting its potential application as a bioactive cosmetic ingredient with moisturizing efficacy comparable to a reference moisturizing agent.

Keywords: *Konjac, Manno-oligosaccharides, Prebiotic, Cosmetic, Moisturizing efficacy*