



Title : Antioxidant Properties of Granular Nanocellulose from Corncob for Use as a Functional Ingredient in Serum Balm Stick.

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Major : Biochemistry and Biochemical Innovation

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Cooperative Education (กรณี นำเสนอผลงานสหกิจศึกษา)

ABSTRACT

Thailand generates substantial corncob agricultural waste annually that remains underutilized. Valorizing this waste is crucial for adding economic value, reducing burning-related environmental problems, and aligning with the beauty cosmetic trend emphasizing natural ingredient safety. This research aims to investigate the antioxidant properties of granular nanocellulose (GNC) from corncob for use as an ingredient in serum balm stick. GNC was produced via enzymatic hydrolysis under certain conditions. GNC particle size was measured using the dynamic light scattering technique, and antioxidant property was evaluated using DPPH, ABTS, and FRAP assays. The produced GNC was incorporated into serum balm stick formulation, followed by physical properties testing. The results revealed that corncob-GNC yield was $37.40 \pm 3.49\%$ with an average particle size of 342 nm, the zeta potential of -36.1 mV, and PDI of 0.356, indicating good particle stability and homogeneity. GNC exhibited antioxidant activity, with IC_{50} values of 24.46 ± 3.69 mg/mL in the DPPH assay and 2.12 ± 0.032 mg/mL in the ABTS assay. The ferric reducing antioxidant power of GNC was found to be 2.33 ± 0.0014 μ mol TE/g. The serum balm stick incorporating GNC was formulated and demonstrated good stability at room temperature, with pH 5.5-6.5. Organoleptic evaluation of the GNC-incorporated serum balm sticks demonstrated that the formulations were safe, stable, homogeneous, non-irritating, and functionally effective as antioxidant cosmetic products. However, further optimization is required to improve miscibility and texture. This research indicated that corncob-derived GNC can be developed as a functional ingredient in cosmetic products, although relatively high concentrations are required.

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