Cosmetic Efficacy for Hydrothermal Extract of Korean Castanea crenata Stem and its Application to Nanoliposome for Transdermal Delivery.

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- **Abstract:** In this study, Korean chestnut stem (KCWE) have been developed as a natural material of functional cosmetics. First of all, the antioxidant, wrinkle improvement, whitening and antimicrobial efficacy of the KCWE was evaluated. The total polyphenol content was 164.96 ± 2.44 mg GAE/g; and the DPPH radical scavenging activity was 82.02 ± 1.00 % at 12.5 μg/mL; and the ABTS+ radical scavenging activity was 92.85 ± 0.67 % at 25 μg/mL; and the elastase activity inhibition was 87.63 ± 3.09 % at 1000 μg/mL; and the tyrosinase activity inhibition was 85.38 ± 1.97 % at 1000 μg/mL; and the antimicrobial activity were shown to the strains of Staphylococcus aureus, Escherichia coli and Cutibacterium acnes, and the inhibition zones were 12.50 ± 0.80 mm, 10.60 ± 1.10 mm and 15.60 ± 0.20 mm, respectively. Next, liposomes containing KCWE were manufactured, whose particle size and zeta potential were 100.67 ± 2.36 nm and -98.10 ± 1.00 mV, respectively. Then, in vitro transdermal permeability of the liposomes was measured, and as a result, cumulative amount permeated of the liposomes was 63.99 ± 2.27 μg/cm² at 24 h, which is 1.75 times higher than the control group. In this study, the physiological activities of Korean chestnut stem were confirmed, and the effect was maximized by enhancing the transdermal permeability by applying liposome technology, so it is inferred very efficient in showing effects on the skin.

- **Keywords:** Korean Castanea crenata stem, Physiological activity, Liposome, Transdermal permeability. Functional cosmetics