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Natural deep eutectic solvent-based green tea leaves extracts for hyaluronidase inhibition in skin care formulations

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Natural deep eutectic solvents (NaDES) are becoming more popular as novel "green" extraction solvents. Previous studies have demonstrated their high potential for extraction of polyphenols, as well as for obtaining extracts with better antioxidant activity compared to conventional extracts made with water and ethanol [1]. In the current study, a NaDES composed of betaine and urea was employed for the extraction of bioactive compounds from dried green tea (*Camellia sinensis*) leaves, with a focus on evaluating anti-hyaluronidase activity. Hyaluronidase is an enzyme involved in the degradation of hyaluronic acid, a glycosaminoglycan crucial for maintaining skin hydration and elasticity. The excessive activity of this enzyme leads to skin dehydration and wrinkle formation, hence its inhibition represents a relevant tool in anti-aging strategies. The anti-hyaluronidase activity was determined using a turbidimetric method which quantifies turbidity originating from undigested hyaluronic acid in the presence of potential inhibitors [2]. The results demonstrated that the betaine–urea NaDES extract exhibited significant anti-hyaluronidase activity, with an IC_{50} value of 6.28 ± 0.4 mg/mL. This inhibitory effect was approximately twice as strong as that of the corresponding water and ethanol extracts, which showed IC_{50} values greater than 13 mg/mL, although it remained lower than the positive control, tannic acid ($IC_{50} = 0.026$ mg/mL). These results highlight the potential of NaDES-based green tea extracts as effective sources of bioactive compounds for anti-aging and dermocosmetic applications.

References:

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