Antioxidant activities and skin hydration effects of rice bran bioactive compounds entrapped in niosomes.

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Source

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Abstract

Bioactive compounds [ferulic acid (F), gamma-oryzanol (O) and phytic acid (P)] in rice bran have been widely used as antioxidants in skin care products. However, one of the major problems of antioxidants is the deterioration of their activities during long exposure to air and light. Niosomes have been used to entrap many degradable active agents not only for stability improvement, but also for increasing skin hydration. The objective of this study was to determine antioxidant activities [by in vitro ORAC (oxygen radical absorbance capacity) and ex vivo lipid peroxidation inhibition assay] and in vivo human skin hydration effects of gel and cream containing the rice bran extracts entrapped in niosomes. Gel and cream containing the rice bran extracts entrapped in niosomes showed higher antioxidant activity (ORAC value) at 20-28 micromol of Trolox equivalents (TE) per gram of the sample than the placebo gel and cream which gave 16-18 micromolTE/g. Human sebum treated with these formulations showed more lipid peroxidation inhibition activity than with no treatment of about 1.5 times. The three different independent techniques including corneometer, vapometer and confocal Raman microspectroscopy (CRM) indicated the same trend in human skin hydration enhancement of the gel or cream formulations containing the rice bran extracts entrapped in niosomes of about 20, 3 and 30%, respectively. This study has demonstrated the antioxidant activities and skin hydration enhancement of the rice bran bioactive compounds when entrapped in niosomes and incorporated in cream formulations.