Formulasi, karakterisasi dan pengujian kapasitas antioksidan resveratrol solid lipid nanopartikel dalam krim tabir surya = Formulation characterization and antioxidant capacity assay of resveratrol solid lipid nanoparticles in sunscreen cream

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Abstrak

Resveratrol merupakan antioksidan polifenol yang utamanya berasal dari minyak biji anggur, memiliki aktivitas antioksidan yang dapat digunakan untuk mencegah terjadinya stres oksidatif pada kulit. Tujuan penelitian ini adalah untuk memformulasi solid lipid nanopartikel (SLN) resveratrol dan mengevaluasi kemampuan SLN resveratrol sebagai nanovesikel resveratrol berpenetrasi melalui kulit. Pada penelitian ini, SLN dibuat dengan metode emulsifikasi pelarut. Selanjutnya dilakukan karakterisasi SLN, mencakup ukuran partikel, indeks polidispersitas, efisiensi penjerapan resveratrol dan morfologi SLN. SLN Resveratrol dengan gliseril monostearat 0,5% menunjukkan morfologi sferis dengan rata-rata ukuran partikel 334,4+8,95 nm, rata-rata indeks polidispersitas 0,289+0,062, rata-rata efisiensi penjerapan resveratrol 48,706+1,319 %, dan ratarata zeta potential ? 27,53+0,802 mV. Studi penetrasi in vitro pada krim SLN resveratrol 10% menghasilkan fluks 6,64 + 0,19 μg/cm2/jam sementara fluks krim resveratrol 6,09 + 0,84 μg/cm2/jam. Hasil penetapan kapasitas antioksidan menunjukkan krim SLN resveratrol 10% memiliki IC50 inhibisi DPPH 87,92 ppm, dibandingkan dengan krim resveratrol memiliki IC50 inhibisi DPPH 280,04 ppm.

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Resveratrol is an antioxidant polyphenol from grape seed oil, shows a potent antioxidant activity that could be beneficial in protection skin from oxidative stress. The objective of this investigation was to develop solid lipid nanoparticles (SLNs) of resveratrol and to evaluate the potential of SLNs as nanovesicle to penentrate the skin layer. The SLN of resveratrol was prepared by solvent emulsification method. The developed SLN resveratrol were characterized for particle size, polydispersity index, entrapment efficiency of resveratrol and morphology. Resveratrol loaded SLN with glyceryl monostearate 0.5% presented spherical morphology with mean particle size 334.4+8.95 nm, mean polydispersity index 0.289+0.062, mean entrapment efficiency of resveratrol 48.706+1.319% and mean zeta potential ? 27.53+0.802 mV. In vitro penetration studies of cream enriched with SLN resveratrol 10% were showed fluks 6.64+0.19 μg/cm2/hour and fluks of cream enriched with resveratrol 6.09+0.84 μg/cm2/hour. Antioxidant capacity assay of cream enriched with SLN resveratrol 10% were showed IC50 DPPH inhibition 87.92 ppm, in comparison to cream enriched with resveratrol showed IC50 DPPH inhibition 280.04 ppm.