# Analisis kadar mangiferin pada organ ginjal tikus sprague-dawley yang diinduksi besi berlebih setelah pemberian mangiferin nanopartikel kitosan-alginat = Analysis of mangiferin levels in kidney of sprague-dawley rats induced with iron overload after administration of mangiferin in chitosan-alginate nanoparticles

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Abstrak

Mangiferin berpotensi menjadi agen pengkelat besi. Namun, rendahnya bioavailabilitas mangiferin membatasi kemampuan mangiferin sebagai agen pengkelat. Sistem penghantaran obat nanopartikel yang terenkapsulasi dalam kitosan-alginat diketahui mampu meningkatkan bioavailabilitas obat. Oleh karena itu, penelitian ini bertujuan untuk menganalisis perbandingan kadar mangiferin konvensional dan mangiferin nanopartikel kitosan-alginat pada organ ginjal. Data penelitian diperoleh dari homogenat organ ginjal tersimpan tikus Sprague-Dawley yang diinduksi besi berlebih. Tikus dibagi menjadi tiga kelompok perlakuan, yaitu diberikan mangiferin konvensional 50 mg/kgBB (MK50), mangiferin nanopartikel kitosan-alginat 50 mg/kgBB (MN50), dan mangiferin nanopartikel kitosan-alginat 25 mg/kgBB (MN25). Pengukuran kadar mangiferin dilakukan dengan menganalisis plasma menggunakan alat HPLC dan mengacu pada metode Estuningtyas. Berdasarkan pengukuran, rata-rata kadar mangiferin di organ ginjal (ng/g) antara lain sebesar 5368.5±1407,52 ng/g (MK50), 4757.78±1420,32 ng/g pada (MN50), dan 4448.06±1938,95 ng/g (MN25). Akan tetapi, tidak terdapat perbedaan signifikan antara kelompok perlakuan. Pemberian mangiferin nanopartikel kitosan-alginat dosis 50 mg/kgBB maupun 25 mg/kgBB tidak meningkatkan kadar mangiferin di ginjal tikus dibandingkan dengan pemberian mangiferin konvensional dosis 50 mg/kgBB. Selain itu, kadar mangiferin nanopartikel kitosan-alginat dosis 25 mg/kgBB tidak lebih tinggi dibandingkan mangiferin nanopartikel kitosan-alginat dosis 50 mg/kgBB di ginjal.

.....Mangiferin has potential to be an iron chelating agent. However, the low bioavailability of mangiferin limits its ability as a chelating agent. The nanoparticle drug delivery system encapsulated in chitosan-alginate is known as an option to increase drug bioavailability. Therefore, this study aimed to analyze the levels of conventional mangiferin and mangiferin chitosan-alginate nanoparticle in the kidney. Data were obtained from stored kidney homogenates of iron overload Sprague-Dawley rat model. Rats were divided into three treatment groups, namely conventional mangiferin 50 mg/kgBW (MK50), mangiferin chitosan-alginate nanoparticle 50 mg/kgBW (MN50), and mangiferin chitosan-alginate nanoparticle 25 mg/kgBW (MN25). The measurement of mangiferin levels was carried out by plasma analysis using HPLC tool and referring to the Estuningtyas method. The average levels of mangiferin in kidneys (ng/g) are 5368.5±1407,52 (MK50 group), 4757.78±1420,32 (MN50 group), and 4448.06±1938,95 (MN25 group). However, there was no significant difference between the treatment groups. The administration of mangiferin chitosan-alginate nanoparticle 50 mg/kgBW or 25 mg/kgBW did not increase mangiferin levels in the rat kidney compared to conventional mangiferin 50 mg/kgBW. In addition, the levels of mangiferin chitosan-alginate nanoparticle 25 mg/kgBW were not higher than mangiferin chitosan-alginate nanoparticle 50 mg/kgBW.