

**PENGARUH NANOEMULSI JAHE MERAH (*Zingiber officinale* Roscoe var. *rubrum*) TERHADAP PERUBAHAN HISTOPATOLOGIS GINJAL, HATI DAN JANTUNG TIKUS (*Rattus norvegicus*) HIPERTENSI AKIBAT LIGASI URETER**

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**INTISARI**

Penderita hipertensi memiliki faktor risiko terhadap Penyakit Ginjal Kronis (PGK). Hipertensi ditandai dengan peningkatan tekanan darah sistole >140 mmHg dan diastole >90 mmHg pada keadaan tenang. Hipertensi pada penderita PGK dapat diatasi diantaranya dengan terapi *Angiotensin Converting Enzyme-Inhibitor* (ACE-I). Jahe merah (*Zingiber officinale* Roscoe var. *rubrum*) memiliki keunggulan yaitu kandungan bioaktif lebih banyak. Shogaol dan flavonoid berperan sebagai antioksidan serta antiinflamasi. Gingerol merupakan antagonis reseptor angiotensin II yang berpotensi sebagai obat anti hipertensi. Penelitian ini bertujuan untuk mengkaji pengaruh nanoemulsi ekstrak jahe merah terhadap gambaran histopatologis organ ginjal, hepar dan jantung tikus yang telah dibuat hipertensi dengan hewan model *Unilateral Ureteral Obstruction* (UUO). Jahe merah diperoleh dari daerah Mlati Sleman, Yogyakarta dan dilakukan determinasi, selanjutnya dilakukan ekstraksi etanol 96%. Ekstrak tersebut diformulasikan menjadi nanoemulsi jahe merah. Efektivitas nanoemulsi jahe merah diujikan pada tikus *Sprague-Dawley* model UUO dengan 4 kelompok perlakuan, yaitu kontrol normal (N), kontrol hipertensi (K-), kelompok perlakuan nanoemulsi jahe merah dosis 100 mg/kgBB (P1), dan kelompok perlakuan nanoemulsi jahe merah dosis 140 mg/kgBB (P2) selama 7 hari perlakuan. Hasil penelitian menunjukkan perlakuan dengan ligasi ureter pada hewan model UUO menyebabkan organ ginjal mengalami perubahan histopatologis berupa atrofi glomerulus, dilatasi tubuli, kongesti kapiler dan adanya infiltrasi limfosit di tubuli. Pemberian nanoemulsi jahe merah dosis 100 mg/kg BB terbukti dapat memberikan perbaikan gambaran histopatologi ginjal yang mendekati normal seperti kontrol normal. Dari hasil penelitian tidak ada perubahan yang signifikan pada jaringan hati dan jantung.

Kata kunci: Hipertensi, ligasi, jahe merah, ginjal, hepar, jantung

**NANOEMULSION EFFECT OF RED GINGER (*Zingiber officinale* Roscoe var. *rubrum*) TO THE HISTOPATOLOGICAL CHANGES OF KIDNEY, LIVER AND HEART OF RATS (*Rattus norvegicus*) HYPERTENSION DUE TO LIGATION OF URETER**

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**ABSTRACT**

Patients with hypertension have a risk factor against chronic kidney disease (CKD). Hypertension is a physiological condition of the body characterized by an increase in blood pressure sistole > 140 mmHg and diastole blood pressure >90 mmHg in a rest condition. Management therapy of hypertension in patients are usually using the Angiotensin Converting Enzyme-Inhibitor (ACE-I) therapy. Red Ginger (*Zingiber officinale* Roscoe var. *rubrum*) has the advantage of having more bioactive content. Shogaol and flavonoids act as antioxidants and anti-inflammatory. Gingerol is a type 1 angiotensin II receptor antagonist that is potentially used as an antihypertensive drug. This study aimed to assess the effect of the nanoemulsion of red ginger extract against the histopatological changes of kidney, liver and heart rats after treated with Unilateral Ureteral Obstruction (UUO) model. The red ginger are collected from cultivator in Mlati Sleman, Yogyakarta after determination of red ginger, were subsequent extracted with ethanol 96%. The extract was formulated into red ginger nanoemulsion. The effectiveness of the Red Ginger nanoemulsion was evaluated to the UUO Sprague-Dawley rat model with 4 treatment groups, control (N), control of hypertension (K-), the treatment group of red ginger nanoemulsion with dose of 100 mg/kgBB (P1), and the treatment group of red ginger nanoemulsion with dose of 140 mg/kg BB(P2). The results of the study showed that ureteric ligation in rats of UUO model caused histopatological changes in the form of glomerular atrophy, dilation of tubuli, congesti capillary and presence of infiltration lymphocytes. Treatment of red ginger nanoemulsion with dos of 100 mg/kg BB could improve the histopathology of kidneys approaching normal compared to the control and other groups. There were no changes of the histopatological of heart and liver.

**Keywords :** Hypertension, ligation, red ginger, kidney, liver, heart.