

INTISARI

POTENSI FERMENTASI *Crescentia cujete* (L.) TERHADAP FUNGSI GINJAL, URINALISIS, IMUNOEKSPRESI *CYCLOOXYGENASE-2* DAN *VASCULAR ENDOTHELIAL GROWTH FACTOR* TIKUS MODEL HIDRONEFROSIS

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24/547894/PKH/00887

Penyakit ginjal kronis telah menjadi tantangan kesehatan. Salah satu kondisi klinis pemicu utama kerusakan parenkim ginjal adalah hidronefrosis. Hidronefrosis menyebabkan pembengkakan pada salah satu atau kedua ginjal akibat akumulasi cairan. Molekul penting yang mendukung fungsi fisiologis normal ginjal yaitu *Cyclooxygenase-2* (COX-2) dan *Vascular Endothelial Growth Factor* (VEGF). Buah berenuk (*Crescentia cujete* L.) merupakan salah satu buah yang memiliki antioksidan. Penelitian ini bertujuan untuk menganalisis efektivitas fermentasi buah berenuk terhadap fungsi ginjal, urinalisis dan imunoekspresi COX-2 dan VEGF pada tikus *Sprague Dawley* model hidronefrosis unilateral. Penelitian ini menggunakan hewan coba tikus *Sprague* jantan sebanyak 30 ekor yang dibagi dalam 5 perlakuan, G1 = Kontrol sehat, G2 = Sham-operated, G3 = Induksi hidronefrosis unilateral dexter (IHUD) + tanpa terapi, G4 = IHUD + Prive Uricran 92,5 mg/kg BB, G5 = IHUD + fermentasi buah berenuk 5,92 mg/kg BB. Pada hari ke-23 pasca-induksi hidronefrosis unilateral dexter dengan metode ligasi ureter diberikan terapi Prive Uricran dan fermentasi buah berenuk selama 14 hari. Pada hari ke-37 dilakukan eutanasia dengan tujuan koleksi sampel serum untuk pengujian BUN dan kreatinin, koleksi urin untuk pengujian Urinalisis, sedangkan koleksi organ ginjal dilakukan untuk pembuatan preparat imunohistokimia COX-2 dan VEGF. Data diuji dengan uji statistik menggunakan Anova. Pemberian fermentasi buah berenuk dengan dosis 5,92 mg/kg BB pada kelompok IHUD mampu menurunkan skor BUN dan kreatinin ($p \leq 0,05$). Pada parameter urinalisis dilaporkan bahwa fermentasi buah berenuk mampu mengembalikan warna urin menjadi kuning, pada leukosit, nitrit, urobilinogen, protein, glukosa, eritrosit turun, sedangkan keton, bilirubin, *specific gravity*, pH, vitamin C normal. Kelompok yang diterapi dengan Prive Uricran mampu menimbulkan efek dengan pola yang sama dengan fermentasi buah berenuk, meskipun tidak sebaik fermentasi buah berenuk pada parameter BUN dan kreatinin. Pemberian Fermentasi buah berenuk mampu menurunkan persen imunoekspresi COX-2 dan VEGF jika dibandingkan dengan kelompok G3 ($p \leq 0,05$). Kesimpulan penelitian adalah fermentasi buah berenuk memiliki potensi sebagai agen terapi alternatif hidronefrosis pada tikus model hidronefrosis unilateral melalui jalur stabilisasi COX-2 dan VEGF yang memperbaiki fungsi ginjal dan urinalisis tikus model hidronefrosis unilateral.

Kata kunci : COX-2, *Crescentia cujete* L., ginjal, hidronefrosis, VEGF

ABSTRACT

FERMENTED *Crescentia cujete* (L.) POTENCIES ON KIDNEY FUNCTION, URINALYSIS, IMMUNOEXPRESSION OF *CYCLOOXYGENASE-2* AND *VASCULAR ENDOTHELIAL GROWTH FACTOR* IN THE KIDNEY OF HYDROPENPHROSIS RAT MODEL

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Chronic kidney disease has become a health challenge. One of the main clinical conditions that triggers renal parenchymal damage is hydronephrosis. Hydronephrosis causes swelling in one or both kidneys due to fluid accumulation. Important molecules that support normal physiological kidney function are Cyclooxygenase-2 (COX-2) and Vascular Endothelial Growth Factor (VEGF). Berenuk fruit (*Crescentia cujete* L.) is one of the fruits that contains antioxidants. This study aims to analyze the effectiveness of berenuk fruit fermentation on kidney function, urinalysis, and COX-2 and VEGF immunoexpression in Sprague Dawley rats with unilateral hydronephrosis. This study used 30 male Sprague rats as experimental animals divided into 5 treatments, G1 = Healthy control, G2 = Sham-operated, G3 = Induction of unilateral hydronephrosis dexter (IHUD) + no therapy, G4 = IHUD + Prive Uricran 92.5 mg/kg BW, G5 = IHUD + fermented berenuk fruit 5.92 mg/kg BW. On the 23rd day after induction of unilateral hydronephrosis dexter by ureter ligation method, Prive Uricran therapy and fermented berenuk fruit were given for 14 days. On the 37th day, euthanasia was carried out with the aim of collecting serum samples for BUN and creatinine testing, urine collection for Urinalysis testing, while kidney organ collection was carried out for making immunohistochemical preparations of COX-2 and VEGF. Data were tested with statistical tests using Anova. Giving fermented berenuk fruit with a dose of 5.92 mg/kg BW in the IHUD group was able to reduce BUN and creatinine scores ($p \leq 0.05$). In urinalysis parameters, it was reported that fermented berenuk fruit was able to return the urine color to yellow, in leukocytes, nitrite, urobilinogen, protein, glucose, erythrocytes decreased, while ketones, bilirubin, specific gravity, pH, vitamin C were normal. The group treated with Prive Uricran was able to produce effects with the same pattern as fermented berenuk fruit, although not as good as fermented berenuk fruit on BUN and creatinine parameters. Giving fermented berenuk fruit was able to reduce the percentage of COX-2 and VEGF immunoexpression when compared to the G3 group ($p \leq 0.05$). The conclusion of the study is that fermented berenuk fruit has potential as an alternative therapeutic agent for hydronephrosis in rats with a unilateral hydronephrosis model through the COX-2 and VEGF stabilization pathway which improves kidney function and urinalysis in rats with a unilateral hydronephrosis model.

Keywords: COX-2, *Crescentia cujete* L., Kidney, Hydronephrosis, VEGF