

**PENGARUH SPIRULINA (*Arthrospira platensis* G.) TERHADAP
KREATININ, UREUM, HISTOPATOLOGI REN, SERTA HEMATOLOGI
TIKUS [*Rattus norvegicus* (Berkenhout, 1769)] YANG DIINDUKSI
NEFROLITIASIS**

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INTISARI

Penyakit batu ginjal merupakan salah satu penyakit paling umum yang ada di saluran kemih. Spirulina (*Arthrospira platensis*) memiliki potensi sebagai anti-nefrolitiasis dan juga dapat beresiko memperparah nefrolitiasis karena tingginya kandungan protein dan asam amino. Penelitian dilakukan terhadap 18 ekor tikus galur wistar jantan yang dibagi menjadi enam kelompok. Perlakuan dilakukan selama 10 hari untuk tiap kelompok yaitu kontrol normal, kontrol penyakit (induksi nefrolitiasis), spirulina bubuk (induksi nefrolitiasis serta bubuk spirulina dosis 300 mg/kgbb), ekstrak spirulina I (induksi nefrolitiasis serta ekstrak spirulina dosis 300 mg/kgbb), ekstrak spirulina II (induksi nefrolitiasis serta ekstrak spirulina dosis 600 mg/kgbb), dan kontrol obat (induksi nefrolitiasis serta Cystone 750 mg/kgbb). Induksi dilakukan dengan etilen glikol 0,75% (v/v) dan amonium klorida 2% (b/v) yang dicampur air minum secara ad libitum. Pengambilan darah dilakukan pada hari ke-0, ke-5, dan ke-11 melalui sinus orbital. Tikus dieuthanasi pada hari ke-11 untuk mengambil organ ginjal. Uji yang dilakukan yaitu serum kreatinin, serum ureum, histopatologi ginjal, serta hematologi. Analisis data diuji normalitasnya, data berdistribusi normal diuji ANOVA dan DMRT, sementara data berdistribusi tidak normal diuji Kruskal-Wallis, dengan tingkat signifikansi $\alpha < 0.05$. Nilai serum kreatinin mengalami penurunan, sementara serum ureum mengalami peningkatan signifikan pada kelompok induksi nefrolitiasis dibandingkan kelompok normal setelah perlakuan. Histopatologi ginjal kelompok penyakit juga menunjukkan jejas sel yang parah disertai adanya nefrolitiasis, berbeda dengan kelompok bubuk spirulina dan ekstrak spirulina yang relatif mendekati kelompok normal. Hematologi yang paling terdampak setelah perlakuan yaitu jumlah trombosit, kecuali pada kelompok spirulina bubuk. Pemberian bubuk spirulina, ekstrak spirulina, maupun cystone dapat meringankan pengaruh buruk akibat induksi nefrolitiasis. Perlakuan yang paling optimal yaitu pemberian bubuk spirulina dosis 300 mg/kgbb.

Kata kunci : Nefrolitiasis, Spirulina (*Arthrospira platensis*), Hematologi, Kreatinin, Ureum, Histopatologi Ginjal

EFFECT OF SPIRULINA (*Arthrospira platensis* G.) ON CREATININE, UREUM, KIDNEY HISTOPATHOLOGY, AND HEMATOLOGY OF NEPHROLITHIASIS-INDUCED RAT [*Rattus norvegicus* (Berkenhout, 1769)]

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ABSTRACT

Kidney stone disease is one of the most common diseases in the urinary tract. Spirulina (*Arthrospira platensis*) has potential as anti-nephrolithiasis and can also be at risk of exacerbating nephrolithiasis because of its high protein and amino acid content. The study was conducted on 18 male Wistar rats which were divided into six groups. Treatment was carried out for 10 days for each group, namely normal control, disease control (nephrolithiasis induction), spirulina powder (nephrolithiasis induction and spirulina powder dose 300 mg/kgBW), spirulina I extract (nephrolithiasis induction and spirulina extract dose 300 mg/kgBW), spirulina II extract (nephrolithiasis induced and spirulina extract dose 600 mg/kgBW), and drug control (nephrolithiasis induced and Cystone 750 mg/kgBW). Induction was carried out with 0,75% (v/v) ethylene glycol and 2% (w/v) ammonium chloride mixed with drinking water ad libitum. Blood sampling was carried out on 0th, 5th, and 11th days through orbital sinus. Rats were euthanized on day 11th to collect kidney organs. Tests performed were serum creatinine, serum urea, renal histopathology, and hematology. Data were analyzed for normality test, normally distributed data were tested by ANOVA and DMRT, while data with abnormal distribution were tested by Kruskal-Wallis, with a significance level of $\alpha < 0.05$. Serum creatinine values decreased, while serum urea experienced a significant increase in the nephrolithiasis induction group compared to the normal group after treatment. The kidney histopathology of the disease group also showed severe cell injury accompanied by nephrolithiasis, in contrast to the spirulina powder and spirulina extract groups which were relatively close to the normal group. Hematology parameters that was most affected after treatment was the platelet count, except for the spirulina powder group. Administering spirulina powder, spirulina extract, and cystone can relieve the bad effects of inducing nephrolithiasis. The most optimal treatment was giving spirulina powder at a dose of 300 mg/kgBW.

Keywords : Nephrolithiasis, Spirulina (*Arthrospira platensis*), Hematology, Creatinine, Urea, Kidney Histopathology