

ABSTRAK

PENGARUH EKSTRAK KROKOT SAYUR (*Portulaca oleracea*) TERHADAP BIOMARKER STRES OKSIDATIF PADA TIKUS MODEL GAGAL GINJAL KRONIS 5/6 SUBTOTAL NEFREKTOMI

Ardiyanta Ramdhanov Dalimunthe
22/503285/KH/11339

Gagal Ginjal Kronis (GGK) merupakan krisis kesehatan global yang memicu kerusakan struktur dan fungsi ginjal progresif yang sangat erat kaitannya dengan kondisi stres oksidatif. Ekstrak krokot sayur (*Portulaca oleracea*) yang kaya akan senyawa fitokimia fenolik dan asam galat diyakini memiliki kapasitas antioksidan tinggi sebagai agen renoprotektif. Penelitian ini bertujuan untuk menganalisis efek renoprotektif ekstrak krokot sayur terhadap penghambatan progresivitas GGK melalui mekanisme modulasi stres oksidatif pada tikus model 5/6 *Subtotal Nephrectomy* (SN). Model penelitian ini berupa *quasi-experimental posttest only controlled group design*. Subjek berupa tikus *Sprague-Dawley* jantan dibagi menjadi empat kelompok: Kontrol Sehat (*Sham Operation/SO*), Kelompok kontrol sakit (SN), P1 (SN + ekstrak 200 mg/kg BB), dan P2 (SN + ekstrak 300 mg/kg BB). Ekstrak diberikan selama 21 hari. Parameter stres oksidatif yang dievaluasi meliputi kadar *Malondialdehyde* (MDA) melalui metode TBARS dan ekspresi relatif mRNA *Superoxide Dismutase-1* (SOD-1) menggunakan RT-PCR. Hasil uji statistik *One-Way ANOVA* dan *Post Hoc Tukey* menunjukkan bahwa kelompok SN mengalami kondisi stres oksidatif yang parah, ditandai dengan lonjakan kadar MDA (10,91 nmol/g) dan *up-regulation* mRNA SOD-1 secara signifikan (0,539) dibandingkan kelompok *sham* (0,394). Pemberian ekstrak krokot sayur terbukti mampu menekan peroksidasi lipid secara *dose-dependent*, dengan titik supresi paling optimal pada kelompok P2 (2,89 nmol/g). Selain itu, tingkat ekspresi mRNA SOD-1 pada kelompok P1 (0,398) dan P2 (0,406) mengalami penurunan kembali mendekati level basal, yang mengindikasikan beban stres oksidatif seluler telah teratasi. Kesimpulannya, ekstrak *Portulaca oleracea* memiliki aktivitas renoprotektif yang kuat dalam menghambat progresivitas kerusakan sel ginjal melalui mekanisme pemutusan rantai stres oksidatif secara sinergis.

Kata Kunci: Gagal Ginjal Kronis, *Malondialdehyde*, *Portulaca oleracea*, 5/6 Subtotal Nefrektomi, *Superoxide Dismutase-1*.

ABSTRACT

THE EFFECTS OF *PORTULACA OLERACEA* EXTRACT ON OXIDATIVE STRESS BIOMARKERS IN A 5/6 SUBTOTAL NEPHRECTOMY RAT MODEL OF CHRONIC KIDNEY DISEASE

Ardiyanta Ramdhanov Dalimunthe
22/503285/KH/11339

Chronic Kidney Disease (CKD) is a global health crisis that triggers progressive structural and functional kidney damage closely associated with oxidative stress conditions. Purslane (*Portulaca oleracea*) extract, rich in phenolic phytochemicals and gallic acid, is believed to possess high antioxidant capacity as a renoprotective agent. This study aimed to analyze the renoprotective effect of purslane extract in inhibiting CKD progression via oxidative stress modulation in a 5/6 Subtotal Nephrectomy (SN) rat model. This study utilized a quasi-experimental posttest-only controlled group design. The subjects, male Sprague-Dawley rats, were divided into four groups: Healthy Control (Sham/SO), Disease Group (SN), Treatment 1 (SN + 200 mg/kg BW extract), and Treatment 2 (SN + 300 mg/kg BW extract). The extract was administered for 21 days. The evaluated oxidative stress parameters included Malondialdehyde (MDA) levels using the TBARS method and Superoxide Dismutase-1 (SOD-1) relative mRNA expression using RT-PCR. The One-Way ANOVA and Tukey Post Hoc statistical tests revealed that the SN group experienced severe oxidative stress, characterized by a significant spike in MDA levels (10.91 nmol/g) and SOD-1 mRNA up-regulation (0.539) compared to the sham group (0.394). The administration of purslane extract significantly suppressed lipid peroxidation in a dose-dependent manner, achieving optimal suppression in the P2 group (2.89 nmol/g). Furthermore, SOD-1 mRNA expression levels in the P1 (0.398) and P2 (0.406) groups decreased to near-basal levels, indicating that the cellular oxidative stress burden had been alleviated. In conclusion, *Portulaca oleracea* extract exhibits strong renoprotective activity in inhibiting the progression of renal cell damage through a synergistic mechanism of terminating the oxidative stress chain reaction.

Keywords: *Chronic Kidney Disease, 5/6 Subtotal Nephrectomy, Malondialdehyde, Portulaca oleracea, Superoxide Dismutase-1.*