

## INTISARI

**Latar Belakang:** Penyakit ginjal kronis (PGK) menyebabkan fibrosis ginjal yang ditandai dengan glomerulosklerosis dan fibrosis interstisial. Ekstrak etanol daun yakon (*Smallanthus sonchifolius*) dilaporkan mempunyai efek mengurangi inflamasi pada diabetes mellitus, tetapi efeknya pada gagal ginjal kronis belum diteliti.

**Tujuan penelitian:** Mengkaji efek pemberian ekstrak etanol daun yakon (*Smallanthus sonchifolius*) terhadap ekspresi gen TGF- $\beta$ 1 dan angka leukosit pada mencit dengan model gagal ginjal kronis.

**Metode Penelitian:** Penelitian ini merupakan penelitian quasi eksperimental dengan *post test only control group design* pada mencit jantan galur Swiss Webster (12-16 minggu, 30-40 gram, n=25). Melalui tindakan *subtotal nephrectomy* (SN), mencit diinduksi sebagai model gagal ginjal kronis dan terminasi dilakukan pada hari ke-14. Setiap hari tiga grup mencit dengan 5/6 SN diberikan ekstrak etanol daun yakon secara oral pada dosis 98 (grup YK1), 49 (grup YK2), dan 24,5 (grup YK3) mg/kgBB. Satu grup mencit dengan SN namun tanpa pemberian ekstrak (grup SN) dan Sham Operation (grup SO) digunakan sebagai kontrol. Ekspresi *Transforming Growth Factor- $\beta$ 1* (TGF- $\beta$ 1) dilihat dengan *Reverse Transcriptase Polymerase Chain* (RT PCR) dan angka leukosit didapatkan dari hasil pemeriksaan darah perifer.

**Hasil:** Kelompok SN mempunyai ekspresi gen TGF- $\beta$ 1 dan angka leukosit lebih tinggi dibandingkan grup SO (TGF- $\beta$ 1 =  $p < 0,05$  vs SO ; Angka leukosit =  $p < 0,01$  vs SO). Pemberian ekstrak etanol daun yakon (YK1, YK2, dan YK3) menyebabkan ekspresi gen TGF- $\beta$ 1 lebih rendah dibanding SN (TGF- $\beta$ 1 =  $p < 0,05$  vs YK1 ;  $p < 0,01$  vs YK2 ;  $p < 0,01$  vs YK3). Pemberian ekstrak etanol daun yakon (YK2 dan YK3) juga menyebabkan angka leukosit lebih rendah dibanding SN (Angka leukosit =  $p < 0,05$  vs YK2 ;  $p < 0,05$  vs YK3).

**Kesimpulan:** Pemberian ekstrak etanol daun yakon menyebabkan ekspresi gen TGF- $\beta$ 1 (YK1, YK2, dan YK3) dan angka leukosit yakon (YK2 dan YK3) lebih rendah dibanding mencit dengan model SN.

**Kata Kunci:** Ekstrak etanol daun yakon (*Smallanthus sonchifolius*), TGF- $\beta$ 1, angka leukosit, *subtotal nephrectomy* (SN)

## ABSTRACT

**Background:** Chronic kidney disease (CKD) is marked by glomerulosclerosis and interstitial fibrosis. Yacon (*Smallanthus sonchifolius*) leaves reported to has protective effect against inflammation on diabetes mellitus, but the effect on chronic kidney disease are not well understood.

**Objective:** To explore etanol extract of yacon leaves effect on TGF- $\beta$ 1 gene expression and total leukocytes count in mice with chronic kidney disease model.

**Methods:** This research was a quasi experimental research with post test only group design in male Swiss Webster mice (12-16 weeks old, 30-40 gram, n=25). Chronic kidney disease was induced by 5/6 Subtotal Nephrectomy (SN) and were sacrificed at day 14. Three groups of mice with SN were supplemented daily with 98 (YK1), 49 (YK2), and 24,5 (YK3) mg/kgBW of yacon leaves extract orally. One group of mice with SN but not supplemented by extract yacon and Sham Operation procedure (SO group) are used for control. Mice were sacrificed, kidney were harvested, RNA extracted and cDNA making were performed. Reverse Transcriptase Polymerase Chain Reaction (RT PCR) analysis was used for quantification of TGF- $\beta$ 1 mRNA gene expression and peripheral blood examination for total leukocytes count.

**Results:** SN group has higher expression of TGF- $\beta$ 1 gene and total leukocytes count compared to SO group (TGF- $\beta$ 1 =  $p < 0,05$  vs SO ; total leukocytes count =  $p < 0,01$  vs SO). Administration of yacon leaves extract (YK1, YK2, and YK3) showed lower expression of TGF- $\beta$ 1 gene (TGF- $\beta$ 1 =  $p < 0,05$  vs YK1 ;  $p < 0,01$  vs YK2 ;  $p < 0,01$  vs YK3). Administration of yacon leaves extract (YK2 and YK3) also showed lower total leukocytes count (Total leukocytes count =  $p < 0,05$  vs YK2 ;  $p < 0,05$  vs YK3).

**Conclusions:** Administration of yacon leaves extract decreased TGF- $\beta$ 1 gene expression and total leukocytes count in mice with subtotal nephrectomy.

**Keywords:** Etanol extract of yacon (*Smallanthus sonchifolius*) leaves, TGF- $\beta$ 1, total leukocytes count, subtotal nephrectomy (SN)