EFEK EKSTRAK ETANOL CIPLUKAN (*Physalis angulata L.*) TERHADAP EKSPRESI GEN TLR-4 PADA TIKUS PUTIH (*Rattus norvegicus*) MODEL DIABETES MELITUS INDUKSI STZ-NA

ABSTRAK

Latar belakang: Diabetes melitus (DM) merupakan kumpulan kelainan metabolik kompleks dengan karakteristik adanya kondisi hiperglikemia. DM dapat menimbulkan komplikasi mikrovaskular dan makrovaskular. Progresi komplikasi DM timbul karena adanya proses inflamasi berkepanjangan. Inflamasi pada DM melibatkan aktivasi *Toll-Like Receptor 4* (TLR-4). Ciplukan (*Physalis angulata* L.) telah diteliti memiliki efek farmakologis memiliki aktivitas antiinfamasi, imunomodulasi, antiproliferasi, antioksidan, dan antibakterial. Penelitian ini dilakukan untuk mengetahui efek pemberian ekstrak etanol ciplukan (*Physalis angulata L.*) terhadap penurunan ekspresi gen TLR-4 pada tikus putih model DM induksi STZ-NA. **Metode:** Penelitian ini merupakan penelitian *true experimental* dengan pendekatan *posttest only with control group design* menggunakan bahan biologi tersimpan berupa organ pankreas tikus putih. Tikus putih berjumlah 25 ekor yang dibagi kedalam 5 kelompok berupa kelompok A: kontrol normal. B: kontrol sakit, C, D, dan E: intervensi dengan dosis 75, 150, 300 mg/KgBB ekstrak etanol ciplukan. Ekspresi gen TLR-4 diperiksa dengan metode *Polymerase Chain Reaction* (PCR) dan dikuantifikasi dengan *software* ImageJ. Analisis data menggunakan uji *One Way ANOVA Welch* **Hasil:** Didapatkan rerata ekspresi gen TLR-4 setiap kelompok yaitu A=0,81±0,41; B=1,08±0,73; C=0,42±0,18; D=1,27±0,91; E=0,34±0,20. Rerata ekspresi gen TLR-4 kelompok B lebih tinggi dari kelompok A. Terdapat tren penurunan rerata ekspresi gen TLR-4 antara kelompok B dengan C dan E. Hasil *One Way ANOVA Welch* menunjukkan p=0,109 sehingga tidak terdapat perbedaan rerata ekspresi gen TLR-4 yang signifikan antar seluruh kelompok **Kesimpulan:** Ekstrak etanol ciplukan (*Physalis angulat* L.) tidak signifikan menurunkan ekspresi gen TLR-4 pada tikus putih model DM induksi STZ-NA.

Kata kunci: *Physalis angulata, Rattus norvegicus*, STZ-NA, TLR-4

EFFECT OF CIPLUKAN (Physalis angulata L.) ETHANOLIC EXTRACT ON TLR-4 GENE EXPRESSION IN STZ-NA INDUCED DIABETIC WHITE RAT

ABSTRACT

Background: *Diabetes mellitus (DM) is a group of complex metabolic disorder with characteristic hyperglicemia. DM causes complications such as microvascular and macrovascular complications. Progression of these complications occur due to prolonged inflammation in DM. Toll-Like Receptor 4 (TLR-4) is involved in DM prolonged inflammation process. Ciplukan (Physalis angulata L.) has been studied and its pharmacological properties such as antiinflammation, immunomodulation, antiproliferation, antioxidant, and antibacterial properties are known. This study aimed to determine the effect of ethanolic ciplukan extract to TLR-4 gene expression decrease in diabetic STZ-NA induced white rats.* ***Methods:*** *This is a true experimental study with posttest only with control group design approach using stored biological material obtained in the form of pancreas from 25 white rats which were divided into 5 group. These groups comprise as Group A: normal control, B: negative control, C, D, and E: Intervention with ethanolic ciplukan extract with doses as 75,150,300 mg/KgBW. Gene expression is examined using Polymerase Chain Reaction (PCR) method and quantified using ImageJ software. Data analysis is carried using One Way ANOVA Welch test.* ***Results:*** *The average of TLR-4 expression in each group were A=0,81±0,41; B=1,08±0,73; C=0,42±0,18; D=1,27±0,91; E=0,34±0,20. The average for NF-κB gene expression of Group B was higher compared to group A. The result showed a decrease of the mean with group C and E compared to group B. One Way ANOVA Welch obtained p=0,109 meaning there was no significant TLR-4 average expression difference between all groups.* ***Conclusion:*** *ethanolic extract of ciplukan put on insignificant decrease on the gene expression of TLR-4 in diabetic STZ-NA induced white rat.*

Keywords: *Physalis angulata, Rattus norvegicus, STZ-NA, TLR-4*