PENGARUH EKSTRAK ETANOL UMBI TALAS MENTAWAI (*Colocasia esculenta*) TERHADAP PROFIL LEUKOSIT DAN LIMPA SEBAGAI INDIKATOR INFLAMASI PADA MENCIT PENGIDAP DIABETES

TESIS

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ABSTRAK

Diabetes melitus tipe 1 dikenal sebagai diabetes yang disebabkan oleh kekurangan insulin akibat rusaknya sel β pankreas. Kondisi hiperglikemia secara kronis meningkatkan pembentukan radikal bebas yang dapat merusak hingga menimbulkan inflamasi pada organ. Pemberian umbi Talas Mentawai diduga memiliki senyawa antiinflamasi yang dapat mengatasi inflamasi terutama pada indikator inflamasi seperti kuantitas leukosit dan struktur organ limpa. Penelitian ini bertujuan untuk menganalisis pengaruh ekstrak etanol umbi talas Mentawai terhadap leukosit diferensial, kadar MDA, aktivitas kalase, morfologi dan histopatologi limpa, serta analisis potensi kandungan senyawa bioaktif secara *molekuler docking*. Penelitian menggunakan rancangan acak lengkap dengan 5 perlakuan 8 ulangan dengan dikondisikan diabetes dan diobati menggunakan ekstrak umbi talas Mentawai dosis 100, 200 dan 400 mg/kgBB selama 28 hari. Setelah dilakukan perlakuan didapatkan kuantitas leukosit diferensial berupa granulosit menurun, kadar MDA menurun, aktivitas katalase meningkat, penurunan berat dan index limpa, berpengaruh dalam menurunkan jumlah *Multinuclear giant cell* dan makrofag bervakuola, serta didapatkan 4 senyawa yang pontesial sebagai antiinflamasi seperti Alfadolone, Benzoylformic acid, Palmitic Acid dan Linolenic acid. Alfadolone merupakan senyawa paling potensial sebagai anti-inflamasi dibuktikan dengan *binding affinity* dengan reseptor INS (-6.7 kcal/mol), PTGS2 (-7.5 kcal/mol), TNF (-6.6 kcal/mol) yang lebih tinggi dibandingkan dengan obat komersial dexamethasone.

Kata kunci: anti-inflamasi, diabetes melitus, leukosit, limpa, *moleculer docking*

ABSTRACT

Type 1 diabetes mellitus is known as diabetes caused by insulin deficiency due to pancreatic β-cell damage. Chronic hyperglycemia conditions increase the formation of free radicals that can damage and cause inflammation in organs. The administration of Talas Mentawai tubers is thought to have anti-inflammatory compounds that can overcome inflammation, especially in inflammatory indicators such as leukocyte quantity and spleen organ structure. This study aims to analyze the effect of ethanol extract of Mentawai taro tubers on differential leukocytes, MDA levels, callase activity, spleen morphology and histopathology, as well as analysis of the potential content of bioactive compounds by molecular docking. The study used a completely randomized design with 5 treatments 8 replicates with conditioned diabetes and treated with 100, 200 and 400 mg/kgBB of Mentawai taro tuber extract for 28 days. After treatment, it was found that the quantity of differential leukocytes in the form of granulocytes decreased, MDA levels decreased, catalase activity increased, decreased spleen weight and index, had an effect in reducing the number of multinuclear giant cells and vacuolated macrophages, and obtained 4 compounds that were pontesial as anti-inflammatory such as Alfadolone, Benzoylformic acid, Palmitic Acid and Linolenic acid. Alfadolone is the most potential compound as anti-inflammatory as evidenced by binding affinity with INS receptor (-6.7 kcal/mol), PTGS2 (-7.5 kcal/mol), TNF (-6.6 kcal/mol) which is higher than the commercial drug dexamethasone.

Keywords: anti-inflammatory, diabetes mellitus, leukocyte, spleen, molecular docking.