AKTIVITAS ANTI INFLAMASI EKSTRAK BUAH JAMBU BIJI (*Psidium guajava*) PADA TIKUS MODEL *Acute Respiratory Distress Syndrome* (ARDS) YANG DIINDUKSI DENGAN LIPOPOLISAKARIDA (LPS)

SKRIPSI

Disusun untuk memenuhi sebagian syarat untuk mendapatkan gelar Sarjana Sains
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AKTIVITAS ANTI INFLAMASI EKSTRAK BUAH JAMBU BIJI (*Psidium guajava*) PADA TIKUS MODEL *Acute Respiratory Distress Syndrome* (ARDS) YANG DIINDUKSI DENGAN LIPOPOLISAKARIDA (LPS)

Oleh
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Sebuah Skripsi yang diajukan untuk memenuhi salah satu syarat memperoleh gelar Sarjana Sains pada Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam

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LEMBAR PENGESAHAN

AKTIVITAS ANTI INFLAMASI EKSTRAK BUAH JAMBU BIJI (*Psidium guajava*) PADA TIKUS MODEL *Acute Respiratory Distress Syndrome* (ARDS) YANG DIINDUKSI DENGAN LIPOPOLISAKARIDA (LPS)

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DISETUJUI DAN DISAHKAN OLEH :

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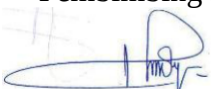

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PERNYATAAN

*Dengan ini saya menyatakan bahwa skripsi yang berjudul "**AKTIVITAS ANTI INFLAMASI EKSTRAK BUAH JAMBU BIJI (Psidium guajava) PADA TIKUS MODEL Acute Respiratory Distress Syndrome (ARDS) YANG DIINDUKSI DENGAN LIPOPOLISAKARIDA (LPS)**" beserta seluruh isinya adalah karya saya sendiri dan tidak dilakukan adanya penjiplakan atau pengutipan yang tidak sesuai dengan aturan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung resiko atau sanksi apabila di kemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya.*

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KATA PENGANTAR

Segala puji bagi Allah subhana wa ta'ala, karena atas izinnyalah penulis dapat menuntaskan skripsi yang berjudul "**AKTIVITAS ANTI INFLAMASI EKSTRAK BUAH JAMBU BIJI (*Psidium guajava*) PADA TIKUS MODEL *Acute Respiratory Distress Syndrome* (ARDS) YANG DIINDUKSI DENGAN LIPOPOLISAKARIDA (LPS)**" yang diajukan sebagai salah satu syarat dan tugas akhir memperoleh gelar Sarjana Sains di Program Studi Biologi, Departemen Pendidikan Biologi, Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam, Universitas Pendidikan Indonesia. Penulis menyadari bahwa skripsi ini jauh dari kata sempurna dan masih terdapat banyak kekurangan pada penulisan dan penelitian ini, untuk itu penulis sangat mengaharapkan kritik dan saran agar bisa menjadi lebih baik lagi. Penulis berharap bahwa skripsi ini bermanfaat bagi pembaca dan dapat dijadikan sebagai referensi untuk penelitian-penelitian selanjutnya.

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AKTIVITAS ANTI INFLAMASI EKSTRAK BUAH JAMBU BIJI (*Psidium guajava*) PADA TIKUS MODEL *Acute Respiratory Distress Syndrome* (ARDS) YANG DIINDUKSI DENGAN LIPOPOLISAKARIDA (LPS)

ABSTRAK

Salah satu penyebab kematian pada pasien COVID-19 terbesar adalah ARDS. *Acute Respiratory Distress Syndrome* merupakan kegagalan pernafasan akut yang disebabkan oleh penumpukan cairan pada paru-paru sehingga mengakibatkan peradangan. Kerusakan pada paru-paru memicu pembentukan berbagai sitokin proinflamasi diantaranya adalah *Tumor Necrosis Factor-alpha* (TNF-α) dan Interleukin-1beta (IL-1β). Induksi LPS pada tikus merupakan model yang paling umum digunakan untuk melihat respons inflamasi, termasuk peningkatan kadar sitokin TNF-α dan IL-1β. Jambu biji (*Psidium guajava* L.) memiliki kandungan tinggi antioksidan penting, anti virus, dan aktivitas anti inflamasi. Tujuan penelitian ini adalah untuk mengetahui aktivitas anti inflamasi ekstrak buah jambu biji pada tikus model ARDS yang diinduksi dengan LPS. Perlakuan awal ekstrak buah jambu biji (EBJB) dengan variasi dosis 50; 400; 800 mg/Kg BB selama 28 hari untuk meningkatkan daya tahan tubuh tikus, selanjutnya diinduksi dengan LPS 5 µg/g BB sebagai hewan model ARDS. Pemberian ekstrak dilanjutkan selama 14 hari, kemudian tikus dibedahkan dan konsentrasi sitokin dari serum dan paru-paru diukur dengan metode ELISA. Induksi LPS menyebabkan peningkatan konsentrasi TNF-α sebesar 438.35 pg/mL (serum), 10.7 pg/mg (paru-paru), konsentrasi IL-1β sebesar 202.44 pg/mL (serum), dan 4.99 pg/mg (paru-paru). Pemberian EBJB dosis 50; 400; 800 mg/Kg BB dapat menurunkan konsentrasi TNF-α dan IL-1β secara signifikan ($p<0,05$). Konsentrasi TNF-α terendah ditunjukkan oleh dosis 400 mg/Kg, yaitu sebesar 199.87 pg/mL (serum) dan 5.77 pg/mg (paru-paru). Konsentrasi IL-1β terendah ditunjukkan oleh dosis 800 mg/Kg, yaitu sebesar 92.21pg/mL (serum) dan 1.95 pg/mg (paru-paru). Dapat disimpulkan EBJB menunjukkan aktivitas anti inflamasi pada tikus model ARDS yang diinduksi LPS

Kata Kunci: *Jambu Biji, Sindrom Gangguan Pernafasan Akut, Lipopolisakarida, Inflamasi, Sitokin*

ANTI INFLAMMATORY ACTIVITY OF GUAVA EXTRACT (*Psidium guajava)* ON ACUTE RESPIRATORY DISTRESS SYNDROME (ARDS) RAT MODEL INDUCTED BY LIPOPOLYSACCHARIDE (LPS)

ABSTRACT

Acute Respiratory Distress Syndrome is one of the highest causes of death in COVID-19 patients. ARDS is an acute respiratory failure caused by buildup of fluid in the lungs, resulting in inflammation. Lungs damage triggers the generation of various proinflammatory cytokines such as tumor necrosis factor-alpha (TNF-α) and interleukin 1 beta (IL-1β). LPS induction in rat is the most commonly used model to assess the inflammatory response, including increased levels of cytokines TNF-α and IL-1β. Guava (*Psidium guajava* L.) has a high content of important antioxidants, anti-viral, and anti-inflammatory activities. The purpose of this study was to determine anti inflammatory activity of guava extract of LPS-induced rats as ARDS model. Pretreatment of guava extract has been given for 28 days to improve rats immune system, than induced by LPS 5 μg/g BW as ARDS animal model. The extract was continued for 14 days, then rats were sacrificed and the inflammatory markers both serum and lung were measured by ELISA method. LPS induction increased TNF-α concentration of 438.35 pg/mL (serum), 10.7 pg/mg (lung), IL-1β concentration of 202.44 pg/mL (serum), and 4.99 pg/mg (lung). Giving various doses of guava extract 50; 400; 800 mg/Kg BW decreased TNF-α and IL-1β concentration in serum and lung significantly ($p<0,05$). The lowest concentration of TNF-α was 199.87 pg/mL (serum) and 5.77 pg/mg (lung) wich caused by dose 400 mg/Kg. The lowest concentration of IL-1β was 92.21pg/mL (serum) and 1.95 pg/mg (lung) wich caused by dose 800 mg/Kg. Guava extract showed anti-inflammatory activity in LPS-induced ARDS rat..

Keywords : *Guava, Acute Respiratory Distress Syndrome, Lipopolysaccharide, Inflammation, Cytokine*

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