

**THE EFFECTS OF ANNONA MURICATA LEAVES TOWARDS BLOOD
LEVELS OF CXCL9 AND LYMPHOBLAST (STUDY IN CEREBRAL
MALARIA PHASE OF SWISS MICE)**



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APPROVAL PAGE

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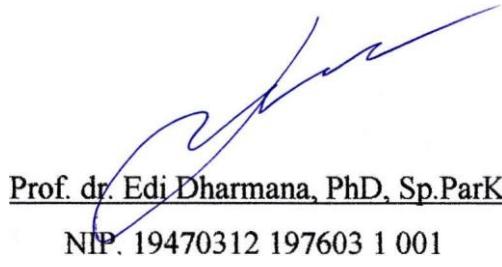
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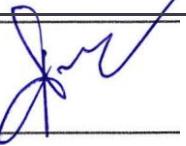
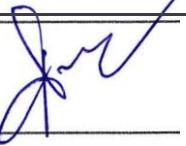


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I hereby declare that this thesis is my own work and has not been submitted in any form for another degree or diploma at any university or other institution of tertiary education , there are no elements belonging plagiarism forth in decree no. 17 of 2010. Information derived from the published or unpublished work of others has been acknowledged in the text and a list of reference is give.

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FOREWORD

Assalamu'alaikum Wr. Wb.

Praise to Allah Almighty for all grace and guidance that thesis with the title “The Effects Of *Annona muricata* Leaves Towards Blood Levels of CXCL9 and Lymphoblast (Study in Cerebral Malaria Phase of Swiss Mice) ”can be resolved. This thesis is structured to meet one of the requirements to obtain a Master degree in Biomedical Sciences (MSi. Med) in the field of Immunology at the Faculty of Medicine, University of Diponegoro.

I realized that without the help and guidance of the various parties, it is not easy for me to finish this thesis. Therefore, on this occasion, the author would like to express respect and gratitude as possible to:

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Writer

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ABBREVIATON

CM :Cerebral malaria

IE: infected erythrocytes

TNF- α : tumor necrosis factor alpha

IFN- γ :gamma interferon

ICAM-1 : intercellular adhesion molecule 1

C-X-C motif: chemokines most strongly implicated to have a role are the chemokine

CXCR3 : receptor 3

CXCL4 : ligand 4

CXCL9 : CXC ligand 9

Pf : *Plasmodium falciparum*

ECM :proposed as target of therapy

ANKA (PbA): swiss mice inoculated *P. berghei* ANKA

pRBC : Parasitized red blood cell

IFN-induced protein of 10kDa

IP-10: interferon-inducible protein of 10 kDa

CD8: cluster of differentiation 8

CD4: cluster of differentiation 4

TCR : *T cell* receptor

CSF: *Cerebrospinal fluid*

AM : *Anona muricata*

P. falciparum: *Plasmodium falciparum*

P.vivax : *Plasmodium vivax*

P. ovale : *Plasmodium ovale*

I-TAC : inducible T cell-chemoattractant

NK : Natural Killer

CD11b (+):cluster of differentiation molecule 11B

ECM : extracellular matrix

EP: *endothelial venules*

IP: *interferon-induced*

ABSTRACT

Background: Cerebral malaria (CM) forms part of the spectrum of severe malaria, with a case

fatality rate ranging from 15% in adults in southeast Asia to 8.5% in children in Africa. Many chemokines have been noted to exhibit increased expression in cerebral malaria, but the chemokines most strongly implicated to have a role are the chemokine (C-X-C motif) receptor 3 (CXCR3) binding chemokines, including chemokine (C-X-C motif) ligand 4 (CXCL4), CXCL9.

Methods: Swiss albino mice, female , weight 150-200 gram,8-9 week old mice divided into 6 group . K(-) is healthy mice, P1 and P2 were group without inoculated PbA with *A. muricata* dosage 100 and 150 mg/kg BW. K(+) is group with inoculated PbA, P3 and P4 were group with inoculated PbA and *A. muricata* dosage 100 and 150 mg/kg BW. Take the blood from mice's eye after mice anaesthezed. Make the spleen culture with stimulate CXCL9, incubation 72 hours and then collect the cell to efpendorf tube, spin the tube with microcentrifuge. Keep the sample to the refrigerator on -80°C to analyze the result and lymphoblast by staining with giemsa and count the percentage 100 cells .data analyze with ANOVA using SPSS. **Results:** the normality test the data is normal because p-value higher than 0.05 and CXCL 9 in all dose studied had no association with the lymphoblast in healthy swiss mice. **Conclusion:** *A. muricata* not significant reduce the level of spleen CXCL9 in *Plasmodium berghei* ANKA infected mice. *A. muricata* not significant increase the level of lymphoblast in *Plasmodium berghei* ANKA infected mice.

Keywords: CXCL9, PbA-infected mice, *A. muricata*, Lymphoblast level.

ABSTRAK

Latar Belakang: malaria serebral (CM) merupakan bagian dari spektrum malaria berat, dengan

tingkat kematian kasus mulai dari 15% pada orang dewasa di Asia tenggara ke 8,5% pada anak-anak di Afrika. Banyak kemokin telah dicatat untuk menunjukkan ekspresi peningkatan dalam malaria serebral, tetapi kemokin paling kuat terlibat memiliki peran adalah kemokin (CXC motif) reseptor 3 (CXCR3) kemokin, termasuk kemokin mengikat (CXC motif) ligan 4 (CXCL4), CXCL9. **Metode:** swiss tikus albino, perempuan, berat badan 150-200 gram, tikus tua 8-9 minggu dibagi menjadi 6 kelompok. K (-) adalah tikus yang sehat, P1 dan P2 adalah kelompok tanpa diinokulasi PBA dengan A. muricata sediaan 100 dan 150 mg / kg BB. K (+) adalah grup dengan diinokulasi PBA, P3 dan P4 adalah kelompok dengan diinokulasi PBA dan A. muricata sediaan 100 dan 150 mg / kg BB. Mengambil darah dari mata tikus setelah tikus anaesthezed. Membuat budaya limpa dengan merangsang CXCL9, inkubasi 72 jam dan kemudian mengumpulkan sel untuk efipendorf tabung, berputar tabung dengan microcentrifuge. Menjaga sampel ke lemari es pada -80 ° C untuk menganalisis hasil dan lymphoblast dengan pewarnaan Giemsa dengan dan menghitung persentase 100 sel DATA menganalisis dengan ANOVA menggunakan SPSS. **Hasil:** uji normalitas data adalah normal karena p-nilai yang lebih tinggi dari 0,05 dan CXCL 9 di semua dosis yang diteliti tidak memiliki hubungan dengan lymphoblast pada tikus swiss sehat. **Kesimpulan:** A. muricata tidak signifikan mengurangi tingkat limpa CXCL9 di Plasmodium berghei ANKA terinfeksi tikus. A. muricata tidak meningkatkan yang signifikan tingkat lymphoblast di Plasmodium berghei ANKA terinfeksi tikus. **Kata kunci:** CXCL9, tikus PBA yang terinfeksi, A. muricata, tingkat lymphoblast.