

**THESIS**

**THE POTENTIAL OF *Ocimum sanctum* LEAF EXTRACT IN  
DECREASING LIVER MALONDIALDEHYDE (MDA)  
LEVEL OF MICE (*Mus musculus*) EXPOSED  
BY LEAD**



**PRISKA CIPTANINGSIH**

**SIN 061611133240**

**FACULTY OF VETERINARY MEDICINE**

**UNIVERSITAS AIRLANGGA**

**SURABAYA**

**2020**

**THE POTENTIAL OF *Ocimum sanctum* LEAF EXTRACT IN  
DECREASING LIVER MALONDIALDEHYDE (MDA)  
LEVEL OF MICE (*Mus musculus*) EXPOSED  
BY LEAD**

Thesis

Submitted as partial fulfilment of requirements for the degree of  
Bachelor of Veterinary Medicine

at

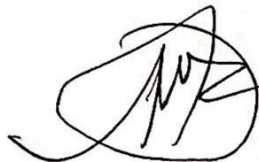
Faculty of Veterinary Medicine, Universitas Airlangga, Surabaya

By:

**PRISKA CIPTANINGSIH**  
**SIN 061611133240**

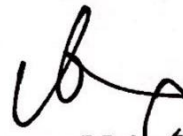
Approving

Supervisor Committees,



**(Suryanie Sarudji, drh., M.Kes.)**

Supervisor



**(Prof. Dr. Anwar Ma'ruf, drh., M.Kes.)**

Co-Supervisor

**DECLARATION**

Hereby, I declare that in this thesis entitled:

**THE POTENTIAL OF *Ocimum sanctum* LEAF EXTRACT IN  
DECREASING LIVER MALONDIALDEHYDE (MDA)  
LEVEL OF MICE (*Mus musculus*) EXPOSED  
BY LEAD**

There is no other work ever published to obtain a college degree in a certain college and according to my knowledge there is also no work or opinion ever written or published by others, except those in writing referred to this paper and mentioned in the reference.

Surabaya, February 17<sup>th</sup>, 2020



Priska Ciptaningsih

SIN. 061611133240

Has been assessed at the Research Result Seminar

Date : February 10<sup>th</sup>, 2020

**RESEARCH RESULT SEMINAR ASSESSMENT COMMITTEE**

Head of Assessor : Prof. Dr. Wiwik Misaco Yuniarti, drh., M.Kes.  
Secretary : Dr. Kadek Rachmawati, drh., M.Kes.  
Member : Dr. Lilik Maslachah, drh., M.Kes.  
Supervisor : Suryanie Sarudji, drh., M.Kes.  
Co-Supervisor : Prof. Dr. Anwar Ma'ruf, drh., M.Kes.

Has been assessed in Thesis Exam

Date : February 17<sup>th</sup>, 2020

**THESIS ASSESSMENT COMMITTEE**

Head of Assessor : Prof. Dr. Wiwik Misaco Yuniarti, drh., M.Kes.  
Member : Dr. Kadek Rachmawati, drh., M.Kes.  
: Dr. Lilik Maslachah, drh., M.Kes.  
: Suryanie Sarudji, drh., M.Kes.  
: Prof. Dr. Anwar Ma'ruf, drh., M.Kes.

Surabaya, February 17<sup>th</sup>, 2020  
Faculty of Veterinary Medicine  
Universitas Airlangga

Dean,



Prof. Dr. Puji Srianto, drh., M.Kes.

NIP. 195601051986011001

## SUMMARY

**Priska Ciptaningsih.** Research entitled “The Potential of *Ocimum sanctum* Leaf Extract in Decreasing Liver Malondialdehyde (MDA) Level of Mice (*Mus musculus*) Exposed by Lead” under the supervision of Suryanie Sarudji, drh., M.Kes. as the first supervisor and Prof. Dr. Anwar Ma’ruf, drh., M.Kes. as the co-supervisor.

Lead is one of heavy metals that considered as the most hazard and cumulative environmental pollutants. Lead exposure to human and animal can cause several health complication associated with hepatotoxic, nephrotoxic, neurotoxic, and cardiovascular disease. Elevated of lead levels in body attribute to the increasing of reactive oxygen species (ROS) which cause oxidative stress. The production of ROS cause a threat to cells stability by causing the lipid peroxidation process. Malondialdehyde is one of the lipid peroxidation products and acts as a reliable biomarkers that capable to determine oxidative stress level in clinical situations. The increasing of liver MDA levels suggest enhanced lipid peroxidation in liver leading to tissue damage. Antioxidant can effectively neutralized the oxidative stress by increasing cellular defences. *Ocimum sanctum* is known to have antioxidant properties such as phenolic, carotenoid, flavonoid, vitamin C, vitamin A, vitamin E, and others. Eugenol is a mayor phenolic compound in *Ocimum sanctum* leaf which has free radical-scavenging activity.

The purpose of this research was to prove the potential of *Ocimum sanctum* leaf extract in decreasing liver malondialdehyde (MDA) level of mice (*Mus musculus*) exposed by lead acetate. The type of this research was

experimental research using Completely Randomized Design (CRD). The sample used male mice range 2.5-3 months with average body weight 25-30 grams which were divided into five groups with four times of minimum repetitions on each group and two male mice in addition as correction factors. In this research, *Ocimum sanctum* leaf extract were given per oral for 24 days to the treatment groups (T1, T2, T3) with dose 140 mg/kg BW, 280 mg/kg BW, and 560 mg/kg BW with per oral lead acetate induced 20 mg/kg BW for 21 days (from the 4<sup>th</sup> day until 24<sup>th</sup> day). Meanwhile the negative control group (C-) was given Tween 80 1% and aquadest, and positive control group (C+) was given Tween 80 1% and lead acetate 20 mg/kg BW.

Malondialdehyde measurement was done using Thiobarbituric Acid (TBA) Assay method. The results were analysed using One Way ANOVA test followed with Tukey's Honestly Significant Difference test as post hoc test. Mean and standard deviation result of malondialdehyde concentration on negative control ( $218.00^a \pm 50.16$  nmol/gram), positive control ( $438.50^c \pm 27.57$  nmol/gram), T1 ( $427.25^c \pm 25.91$  nmol/gram), T2 ( $369.25^{bc} \pm 32.25$  nmol/gram), and T3 ( $310.00^b \pm 33.69$  nmol/gram). It can be concluded that per oral administration of *Ocimum sanctum* leaf extract can decrease liver malondialdehyde (MDA) level of mice (*Mus musculus*) which were exposed by lead.

## ACKNOWLEDGMENT

First and most of all, countless thanks and with full of gratitude for God Almighty, as it is for His blessing, mercy, and guidance, so that the author able to complete this research result entitled **The Potential of *Ocimum sanctum* Leaf Extract in Decreasing Liver Malondialdehyde (MDA) Level of Mice (*Mus musculus*) Exposed by Lead.**

With this favourable circumstance, I would like to convey my gratitude to all parties who have provided guidance, assistance, encouragement, and enthusiasm to the author during the study and conducted research at the Faculty of Veterinary Medicine, Universitas Airlangga Surabaya therefore the author managed to complete the preparation for this research result, among others are:

Prof. Dr. Pudji Srianto, drh., M.Kes. as the dean of Universitas Airlangga's Faculty of Veterinary Medicine and all the vice deans for the opportunity given to follow education and complete this research here.

My supervisor committee, Suryanie Sarudji, drh., M.Kes. as the first supervisor and Prof. Dr. Anwar Ma'ruf, drh., M.Kes. as the co-supervisor, for the patience, assistance, advices, and motivations given to the author for the completion of this research.

Prof. Dr. Wiwik Misaco Yuniarti, drh., M.Kes. as the head of assessors and research supervisor, Dr. Kadek Rachmawati, drh., M.Kes. as secretary, and Dr. Lilik Maslachah, drh., M.Kes. as member of the assessor committee for knowledge, guidance, suggestion in completing my research.



Didik Handijatno, Ph.D., MS., drh. and Dr. Hani Plumeriastuti, drh., M.Kes. as the academic advisors and all the teaching staff and lectures who gave support and care along the academic journeys. Thanks to my research team Nina Krismaharani, Kristania Celia, Kharisma Dwi Veteriananta and also my friends that the author does not able to mention one by one for the support, hard work, care, laughter and joys from the beginning to the completion of this research. Thank you to my International class batch 2016 classmates for the wonderful journey of my degree life.

Special thanks to my wonderful family, my mother Maria Magdalena Ermiami and my father Condro Surastomo for their endless support both morally and financially, motivation and prayer during the whole of the author's academic years. To my siblings, Ruben Wicaksono dan Sonia Graciela that always help and love me sincerely.

The author acknowledge that the writing is still lack and far from perfection, and as such critics and suggestions are very welcome. May this research result will be useful for science and give contribution to the veterinary medicine world.

Surabaya, February 17<sup>th</sup>, 2020

Author