

THESIS

**THE RENAL PROTECTIVE EFFECT OF *Nigella sativa*  
EXTRACT ON MICE INDUCED BY NICOTINE**



By

EUGENIA CITTA NIRMALA  
SIN 061611133036

FACULTY OF VETERINARY MEDICINE  
UNIVERSITAS AIRLANGGA  
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**THE RENAL PROTECTIVE EFFECT OF *Nigella sativa*  
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Thesis

submitted in partial fulfillment of the requirement for the degree of

Bachelor of Veterinary Medicine

at

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by

**EUGENIA CITTA NIRMALA**  
SIN 061611133036

Approval of

Supervisor Committee,



**(Prof. Sri Agus Sudjarwo drh., Ph.D.)**  
Supervisor



**(Dr. Mustofa Helmi Effendi drh., DTAPH)**  
Co-Supervisor

**DECLARATION**

I hereby declare that the thesis entitled

**THE RENAL PROTECTIVE EFFECT OF *Nigella sativa* EXTRACT ON  
MICE INDUCED BY NICOTINE**

No paperwork has been filled to obtain a bachelor's degree at the university and also according to my knowledge, no paperwork or self-opinion ever written or published by others, except which is written in this paperwork that had mentioned in the bibliography.

Surabaya, 21 January 2020



Eugenia Citta Nirmala  
SIN 061611133036

Examined in Research Result Seminar

Date: 6 January 2020

**ASSESSMENT COMMITTEE OF RESULT SEMINAR**

Chairman : Dr. Thomas Valentinus Widiyatno, drh., M.Si.

Secretary : Dr. Lilik Maslachah, drh., M.Kes.

Member : Prof. Dr. Wiwik Misaco Yuniarti, drh., M.Kes

Supervisor : Prof. Sri Agus Sudjarwo drh., Ph.D.

Co Supervisor : Dr. Mustofa Helmi Effendi drh., DTAPH.

Examined in Thesis Seminar

Date: 20 January 2020

**ASSESSMENT COMMITTEE OF THESIS SEMINAR**

Chairman : Dr. Thomas Valentinus Widiyatno, drh., M.Si.  
Secretary : Dr. Lilik Maslachah, drh., M.Kes.  
Member : Prof. Dr. Wiwik Misaco Yuniarti, drh., M.Kes  
: Prof. Sri Agus Sudjarwo drh., Ph.D.  
: Dr. Mustofa Helmi Effendi drh., DTAPH.

Surabaya, 21 January 2020

Faculty of Veterinary Medicine  
Universitas Airlangga  
Dean,



Prof. Dr. Pudji Srianto, drh., M.Kes  
NIP. 19560105186011001

## SUMMARY

Nicotine exposure happens mostly per inhalation. However, the effect of this substance is systemic as it acts as free radicals and causing oxidative stress. Oxidative stress includes the lipid peroxidation process which breaks the cell's membrane lipids and alters cell protein and DNA. Kidney is one of organs that is vulnerable to oxidative stress as it contains high amount of poly-unsaturated fatty acid. Kidney damage is observed and scored to evaluate general kidney condition.

Twenty-five male mice were used for this research and divided into five groups C-, C+, T1, T2, and T3. After 7 days of adaptation period, treatment group received *Nigella sativa* extract in Tween 80 1% and CMC-Na 1% for 4 days with no nicotine injected. T1 was given 200 mg/kg *Nigella sativa* extract, T2 was given 400 mg/kg *Nigella sativa* extract and T3 was given 800 mg/kg *Nigella sativa* extract. Meanwhile, the control groups were given with Tween 80 1% and CMC-Na 1%.

After 4 days, C- group was given CMC-Na 1% and Tween 80 1% per oral. 30 minutes later they were injected with aquadest intraperitoneally. C+ was given CMC-Na 1% and Tween 80 1% per oral, after 30 minutes they were injected with nicotine 2 mg/kg intraperitoneally. T1 was treated with 200mg/kg *Nigella sativa* extract per oral 30 minutes prior injection with nicotine 2mg/kg intraperitoneally. T2 was treated with 400mg/kg *Nigella sativa* extract per oral 30 minutes prior injection with nicotine 2mg/kg intraperitoneally. T3 was treated with 800mg/kg *Nigella sativa* extract per oral 30 minutes prior injection with nicotine 2mg/kg intraperitoneally.

After 28 days, mice were sacrificed and the right kidney were taken and made into slides. The histopathological changes were observed and scored under Nikon E 100 LED MV light microscope. The image then captured using OptiLab camera and OptiLab Viewer 2.2 to provide second opinion by veterinary pathologist of Veterinary Pathology Department, Faculty of Veterinary Medicine, Universitas Airlangga. The gained histopathological scoring data then was analyzed using IBM SPSS Statistics 20.0 software under non-parametric method Kruskal Wallis Test and evaluated using Mann-Whitney U test for all pairwise.

The research result from Kruskal Wallis and Mann-Whitney U showed that there was gradual decrease in kidney damage indicator respectively glomerular congestion, interstitial congestion, Bowman space dilatation and necrotic tubular cell in treatment group compared to control positive group. The decrease was significant for interstitial congestion and necrotic tubular cell, though insignificant for glomerular congestion and Bowman space dilatation. Although, treatment with *Nigella sativa* extract in 800 mg/kg dose showed significant decrease of interstitial bleeding and necrotic tubular cell compared to mice kidney induced by nicotine.

Based on this research data, it can be concluded that *Nigella sativa* extract was able to protect kidney from damage by nicotine.

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I, as the author, acknowledge that this writing is still far from perfection. However, I hope this research can still be useful for the development of Veterinary Medicine and may give positive benefits for society.

Surabaya, 9 January 2020

Author