

**PROTECTIVE EFFECTS OF *NIGELLA SATIVA* EXTRACT ON
ETHANOL INDUCED HEPATIC TISSUE DAMAGE AND TNF α
EXPRESSION.**

(EXPERIMENTAL STUDY IN WISTAR RATS)



Thesis for

Master of Biomedical Science and medical specialist 1 program.

Prepared by :

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**Protective Effects Of *Nigella sativa* Extract on Ethanol induced Hepatic
Tissue Damage and TNF α Expression .**

(Experimental Study In Wistar Rats)

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DECLARATION

I am hereby declare that this submission is my own work and that to the best of my knowledge and belief it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning .

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Semarang, 20 January, 2012

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ABBREVIATIONS

ADH	<i>Alcohol dehydrogenase</i>
ALDH	Aldehyde dehydrogenase
MEOS	<i>Microsomal Ethanol Oxidizing System</i>
<i>SREBP-1c</i>	Sterol Regulatory Element Binding Protein-1c
AMPK	5- Adenosine Monophosphate - activated Protein Kinase
MAPK	Mitogen-activated protein kinase
<i>MAA adducts</i>	<i>Malondialdehyde-Acetaldehyde-Protein Adducts</i>
EGR-1	Early Growth Response protein 1
TRIF	TIR-domain-containing adapter-inducing interferon- β
TLR4	Toll-Like Receptor 4
MCP-1	Monocyte Chemotactic Protein-1
PPAR- α	Peroxisome proliferator-activated receptor $-\alpha$
SAH	<i>S-Adenosylhomocysteine</i>
SAMe	S-Adenosyl methionine
TCA Cycle	Tricarboxylic acid cycle , <i>citric acid cycle, Krebs cycle</i>
NAD	Nicotinamide Adenine Dinucleotide

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ABSTRAK

Latar Belakang: Minuman alkohol menyebabkan perlemakan hati, peradangan jaringan hati, dan sirosis hati. Biji Nigella Sativa telah dilaporkan memiliki efek anti-inflamasi.

Tujuan: untuk mengidentifikasi dan menganalisis efek perlindungan ekstrak Nigella Sativa pada kerusakan hati yang diinduksi alkohol pada tikus wastr.

Metode: Penelitian ini eksperimental yang digunakan dengan *randomized post-test only control group design*. dalam 24 laki-laki wistar tikus dibagi menjadi empat kelompok setiap kelompok berisi 6 ekor, kelompok kontrol diberi etanol 8mg/kgBB setiap hari selama 8 minggu, kelompok 2, kelompok 3, diberikan Nigella Sativa ekstrak sebagai 0.5g/kgBB/hari, 1g/kgBB/hari, 1.5g/kgBB/hari masing-masing, menambahkan 8mg/kg/hari Etanol setelah satu jam untuk masing-masing 3 kelompok sehari selama 8 minggu, jaringan hati yang H&E bernoda dan diamati untuk perubahan sel hati, *imunohistochemistry* dilakukan untuk menghitung persentase warna coklat TNF α bernoda dan intensitas pewarnaan, kemudian mengklasifikasikan dengan Allred Score.

Hasil: ada yang parah, sedang, ringan dan normal jaringan hati untuk kontrol, group1, group2, group3 masing masing, perbedaan antara kelompok-kelompok dan antara masing-masing kelompok secara statistic signifikan ($p=0.00$), kecuali antara kelompok kontrol dan kelompok 1 ($p=0.093$) untuk kerusakan jaringan hati, ada yang 3Allred, 2Allred, 1Allred, 0Allred untuk kontrol, group1, group2, group3 masing masing, perbedaan antara kelompok-

kelompok dan antara semua kelompok secara statistic signifikan ($p=0.00$) untuk TNF α expresi.

Kesimpulan: Ekstrak Nigella Sativa menunjukkan pelindung anti-inflamasi efek, seperti mengurangi kerusakan dan perubahan ekspresi TNF α di hepatocyte yang diinduksi oleh etanol.

Keywords: Etanol, kerusakan jaringan hati, TNF α

ABSTRACT

Background: Alcohol intake causes fatty liver, liver tissue inflammation, and liver cirrhosis, *Nigella sativa* seeds had been reported with anti-inflammatory effect.

Objective: To identify and analyze the protective effect of *Nigella sativa* extract on alcohol induced liver damage in wistar rats.

Method: This experimental study used randomized post-test control group design in 24 male Wistar rats divided into four groups each group contain 6 rats, control group given ethanol 8mg/kgBW/day for 8 weeks, group1 ,group 2,group 3, given *Nigella sativa* extract plus ethanol after one hour for 8 weeks as 0.5 g/kgBW/day, 1 g/kgBW/day, 1.5 g/kgBW/day respectively, ethanol dose 8mg/kgBW/day, the liver tissue were H&E stained and observed for liver cell changes , *Imunohistochemistry* was done to count the percentage of TNF α in Cytoplasm stained brown color and the intensity of the staining then its classify according to Allred Score.

Result: There was severe, moderate, mild and normal liver tissue for control, group1, group2,and group3 respectively the difference among groups and between each group were statistically significant ($p=0.00$), except between control group and group 1 ($P=0.093$) for the liver tissue damage, there was 3 Allred,2 Allred, 1 Allred and 0 Allred for control, group1, group2, group3 respectively the difference among groups and between all groups was statistically significant ($p=0.00$) for TNF α expression.

Conclusion: *Nigella sativa* extract shows protective anti-inflammatory effect, as reducing the damage change and the TNF α expression in hepatocyte that induced by ethanol .

Keywords: ethanol, liver tissue damage, TNF α