

THESIS

**THE HEPATOPROTECTOR EFFECT OF BEETROOT (*Beta vulgaris*L.) EXTRACT IN
DECREASING MALONDIALDEHYDE (MDA) LEVEL ON RATS (*Rattus norvegicus*)
INDUCED WITH CARBON TETRACHLORIDE (CCl₄)**



By

HUSNA AYUSTIKA IMANIASITA

SIN 061611133197

FACULTY OF VETERINARY MEDICINE
UNIVERSITAS AIRLANGGA
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ENDORSEMENT FORM

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Research Result

Submitted in partial fulfillment of requirement for degree of
Bachelor of Veterinary Medicine

At

Faculty of Veterinary Medicine Universitas Airlangga

By:

HUSNA AYUSTIKA IMANIASITA

061611133197

Approval of
Superior Committee



Dr. Boedi Setiawan drh., M.P.

Supervisor



Dr. Nove Hidajati M.Kes., drh

Co-supervisor

DECLARATION

Hereby, I declare that in this research result entitled:

**THE HEPATOPROTECTOR EFFECT OF BEETROOT (*Beta vulgaris L.*) EXTRACT IN
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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, 26th January 2021



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Husna Ayustika Imaniasita
SIN 061611133197

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Has been assessed at the Research Result Seminar

Date : 4th January 2021

ASSESSMENT COMMITTEE OF RESEARCH RESULT SEMINAR

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

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

Member : Dr. Eduardus Bimo Aksoro Herupradoto, drh., M.Kes.

Supervisor : Dr. Boedi Setiawan, drh., M.P.

Co-Supervisor : Dr. Nove Hidajati, M.Kes., drh.

Has been assessed at the Thesis Seminar

Date : 26th January 2021

ASSESSMENT COMMITTEE OF THESIS SEMINAR

Chief : Dr. Thomas Valentinus Widiyatno, drh., M.Si.
Secretary : Dr. Lilik Maslachah, drh., M.Kes.
Member : Dr. Eduardus Bimo Aksoro Herupradoto, drh., M.Kes.
Supervisor : Dr. Boedi Setiawan, drh., M.P.
Co-Supervisor : Dr. Nove Hidajati, M.Kes., drh.

Surabaya, 26th January 2021

Faculty of Veterinary Medicine

Universitas Airlangga

Dean,



Prof. Dr. Mirni Lamid, MP., drh

NIP : 196201161992032001

SUMMARY

CCl_4 or known as carbon tetrachloride is substance that does not occur naturally and more likely to released into the environment by human activities that the utilization controlled and practically banned by the Montreal Protocol (MP) because it's ozone-depleting substance. Even it's controlled and banned, some researcher found that the emissions of carbon tetrachloride came from the usage and production of *chlorine* in industrial and domestic uses e.g paper bleaching and disinfection also found in dry-cleaning textile laundries, in fire extinguishers, and as a precursor of refrigerants or rocket propellant. Carbon tetrachloride are free radicals that could form lipid peroxidation.

Beetroot is one of the well-known antioxidant source. Beetroot contain several type of antioxidant. Betanin is one of compound in beetroot that has red pigment and has hepatoprotective effect against free radical. Betanin can activated nuclear factor erythroid 2-related factor 2 antioxidant response element (Nrf2-ARE). The Nrf2-ARE translates detoxification enzymes such as glutathione synthetase (GSS), glutathione reductase (GR), glutathione peroxidase (Gpx), thioredoxin (TRX), thioredoxin reductase (TRR), catalase (CAT), superoxide dismutase (SOD), and peroxiredoxin (PRX) to prevent oxidative stress. Besides, the chemical structure of betanin called hydroxyl ortho position tend to form a relatively stable radical because phenolic and cyclic amine groups not interacting with lipid radical.

This research used experimental laboratory research with preventive treatment. This research used 25 male rats as an experimental animal whih divided into 5 groups randomly with repetition each group. This research held for 21 days with the negative control C(-) was administrated with suspension of CMC Na 0.5% orally and injected intraperitoneal with olive oil, the control positive C(+) was administrated with CMC Na 0.5% orally and injected intraperitoneal with CCl_4 dissolved in olive oil. The treatment group T(1), T(2), and T(3) were administrated

with beetroot extract doses 200, 400, and 800 mg/kg BB sequentially dissolved in CMC Na 0.5% orally for 14 days then injected intraperitoneal with CCl_4 dissolved in olive oil in the last day of treatment. One day after the last day of the treatment, mice anesthetized with ketamin and xylazine then sacrifice with cervical dislocation and did the liver organ collection then did malondialdehyde assay with Thiobarbituric Acid Reacting Substance (TBARS) assay.

The result of malondialdehyde levels with One Way Analysis of Variance (ANOVA) method to analyse the data then continued with *Tukey HSD* method showed significant difference $p < 0.05$. The mean and standard deviation result shown that negative control group ($78.75^a \pm 42.56$ nmol/gram), positive control group ($646^c \pm 130.86$ nmol/gram), T1 ($408^{bc} \pm 216.4$ nmol/gram), T2 ($263.25^{ab} \pm 122.35$ nmol/gram), and T3 ($128.5^a \pm 25.42$ nmol/gram). It can be concluded that beetroot extract is able to protect rat's liver by decreasing the level of malondialdehyde induced with carbon tetrachloride.