

**UNIVERSITI TEKNOLOGI MARA**

**THE EFFECT OF TOCOTRIENOL-  
RICH FRACTION (TRF)  
SUPPLEMENTATION IN DELAYING  
THE CONSEQUENCES OF AGING  
ON THE QUALITY OF OOCYTES  
AND EMBRYOS IN MICE**

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**MSc**

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## AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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## ABSTRACT

Aging is one of the major contributors of female infertility. In excess, reactive oxygen species (ROS) can eventually causing oxidative stress which will directly impact the reproductive system. Fortunately, tocotrienol is proven to play a role in protecting the damaging effect of ROS in female reproductive system. Accordingly, the objectives of this study were to determine the effect of tocotrienol-rich fraction (TRF) supplementation in aging mice on the i) oocytes and embryos quality together with the embryonic development and ii) telomere length, telomerase activity and estradiol level. This study was divided into Experiment 1 and Experiment 2: young female mice at the age of six weeks old (Group A) and aging mice of six months old were used. Aging mice groups were divided into 5 subgroups; one group was kept without any supplementation (Group B1), one group was given tocopherol-stripped corn oil as vehicle control (Group B2), three groups were given TRF supplementation orally at the dose of 90, 120 and 150 mg/kg BW (Group B3, B4 and B5) respectively for two months. After two months duration, mice were superovulated and euthanized to collect the oocytes and embryos for quality assessment. Oocytes and embryos retrieved were further analysed using comet assay to determine the degree of deoxyribonucleic acid (DNA) damages. In addition, in Experiment 2, at the end of TRF-supplementation period, mice were superovulated and euthanized to collect the plasma for estradiol levels analysis, ovaries for telomere length and telomerase activity. Results showed that aging negatively affected the oocytes as well as embryo quality. Aging also shorten the telomere length and increased the telomerase activity. The TRF supplementation was able to improve the oocytes quality and embryonic development at the dose of 150 mg/kg BW. Furthermore, TRF was able to improve the telomere length and telomerase activity. Consequently, it is concluded that TRF-supplementation delay the consequences of aging that lead to infertility by protecting the reproductive organs from further deterioration.

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