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**EFFECT OF PATERNAL SUPPLEMENTATION OF PALM OIL
(TOCOTRIENOL RICH FRACTIONS) ON MALE FERTILITY**

By

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**Thesis Submitted in Partial Fulfillment of the Requirements for
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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 result 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 Undergraduate, University Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Tocotrienol Rich fraction (TRF) is composed of tocotrienol isomer that is part of Vitamin E family. This study was performed to investigate the fertility potential and toxicity effects of TRF on male rats. Fifteen (15) adult male Wistar rats were randomly divided into 5 groups (n=3). Control negative groups was administered orally with distilled water (F), control positive group (G) groups were administered orally with tocopherol stripped corn oil and TRF supplementation at dose of 30 mg/kg (H), 60 mg/kg(I) and 90 mg/kg(J). After 7 days of treatment, blood collection was performed by retro orbital sinus for biochemical analysis while sperm were collected from cauda epididymis for sperm analysis. 60 mg/kg showed the highest level of sperm count among TRF treatment group eventhough the positive control showed the highest sperm count among all groups. The results also showed normal sperm morphology were significantly increased in treated group (H-J) compared to negative/positive group. Hepatotoxicity assessment revealed significant decreased in ALP group in 30 mg/kg and 60 mg/kg of TRF treated group with control groups but no significant difference in AST, and ALT were found. Renal profile for nephrotoxicity of creatinine and urea level also showed no significant different. Reproductive hormone profile of FSH and LH showed significant difference however testosterone showed no significant different. Nevertheless, histological finding has revealed the improvement of spermatogenesis activity in 30 mg/kg and 60 mg/kg of TRF. This study was suggested that TRF have potential in improving fertility without significant hepatotoxicity and nephrotoxicity effect.

CHAPTER 1

INTRODUCTION

Total fertility rate is declining fast worldwide including Malaysia (Hamzah, n.d.). Based on the report from Centers for Disease Control and Prevention (CDC), birth rate in United States in the year of 2012 is 12.6 per 1000 population. Infertility is a reproductive disease that causes inability to achieve pregnancy after minimum of one year of practicing unprotected sexual intercourse (Cooper et al., 2010). It affects couples that tried to conceive after attempts of unprotected sexual intercourse. Almost 15% of couples faced infertility at their reproductive age (Tingen et al., 2003). Male factor contributed up to 60% of infertile couples (Attaman et al., 2011). These strongly showed that paternal factor have high percentages contributing to infertility, with research pointing to sperm deficiency as the main culprit with percentages of 40 – 90%.

Statistics showed 90% infertile males were diagnosed as oligozoospermia, due to the primarily to one or combination of factors that included lifestyle, diet, and working habits (Low et al., 2013). These factors shown to have deleterious effect on sperm quality and quantity that relate to negative effect on achieving successful conception (Kumar et al., 2009). Besides that, other factors such as hormonal imbalances, drug abuse, depression, anxiety, stressful life events and certain medical conditions such as diabetes and coronary heart disease can cause several dysfunctions in male fertility (Neelesh et al., 2011). Environmental, physiological and genetic factors also have been shown to have defective effects on male reproductive performance (Syazana, et al., 2011). Alterations in the structure or functions of the male reproductive system will lead to infertility problem because the system is extremely sensitive to various factors such as drugs and pollution, which can induce structural and functional alterations (Khani et al., 2013).