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**EFFECT OF ORAL SUPPLEMENTATION OF PALM OIL TOCOTRIENOL-
RICH FRACTION ON OOCYTES AND REPRODUCTIVE PARAMETER OF
FEMALE RATS**

By

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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, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Infertility is a biological inability of an individual to conceive and half of the cases are related to female infertility. Palm oil TRF was demonstrated to have potential antioxidant to improve oocytes quality and female reproductive system. This study was performed to investigate the effects of oral supplementation of palm oil TRF on oocytes and reproductive parameter of female rats. Different concentrations of palm oil TRF (30 mg/kg, 60 mg/kg, and 90 mg/kg) were used. Thirty (30) adult female Wistar rats were randomly divided into 5 groups (n=6). Control negative group (G1) administrated with distilled water, control positive group (G2) was administrated orally with corn oil (as vehicle of palm oil TRF) and treatment groups were administrated orally with palm oil TRF at concentration of 30 mg/kg (G3), 60 mg/kg (G4) and 90 mg/kg (G5). After 7 days of treatment, blood collection was performed by retro orbital sinus for biochemical analysis while oocytes were retrieved from oviducts for oocytes count and COCs grading. Oocytes count and normal COCs were increased in 60 mg/kg treated group (G4) compared to other groups. However, there are no significant differences between groups. Histological finding on ovaries has revealed 60 mg/kg (G4) and 90 mg/kg (G5) groups have significantly different on OSE height compared to other groups. Hepatotoxicity and nephrotoxicity assessments revealed 90 mg/kg group (G5) demonstrated significantly different between treated groups and control groups. This study was suggested that palm oil TRF have potential in improving oocytes quality and female reproduction. However, further studies should be carried out on hormonal study, IVM, IVF and pregnancy outcomes to ensure the strong evidence on the effects of oral supplementation of palm oil TRF on female fertility.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF STUDY

Nowadays, the number of couples seeking infertility treatment is constantly increasing, about 15% of all couples over the world are infertile, which 50% of them are caused by female factors, such fewer oocytes production or lower oocytes quality (Meniru et al., 2002). These factors can be treated by assisted reproductive technologies (ART), such as in vitro fertilization (IVF), ovulation induction (OI), ovarian stimulation, and in vitro maturation (IVM) (Lewis, 2007). However, these treatments have a few of side effects on female reproductive function, such as the generation of oxidative stress (OS) and reactive oxygen species (ROS) (Agarwal et al., 2005; Combelles, 2009). Recently, nutritional supplementation has been found to play an important role in improving reproductive health, thus can reduce the factors that cause infertility cases in female (Westphal et al., 2004).

Female ovaries are an important reproductive organ in female reproductive function, as it is the source of oocytes production and hormones regulation (Stefansdottir et al., 2014). However, there are several factors that can be influenced in the reduction of female reproductive function, such as lifestyle factors like smoking habits, environmental and chemical exposure, and advanced age of female. These factors can contribute to generation of oxidative stress (OS) through free radicals in female reproductive system, which can lead to the damage of oocytes and embryos following by reduction of pregnancy rate and outcome (Combelles, 2009). Therefore, antioxidant, such as vitamin E may acts as essential role in preventing these problems (Salem & Gomaa, 2014).