

UNIVERSITI TEKNOLOGI MARA

**ELUCIDATION OF ANTI –
INFERTILITY POTENTIAL OF
Phyllanthus gomphocarpus (Cermela
Hutan) ON DIETARY
ADMINSTERED ENDOCRINE
DISRUPTOR BISPHENOL A (BPA) IN
RATS**

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ABSTRACT

Male infertility caused by various factors attributes a detrimental effect to couples if not been addressed properly. *Phyllanthus gomphocarpus* is one of the Malay traditional herbs that was traditionally claimed to have positive impacts towards human health and enhance male fertility. Three different time and temperature setting for 10% aqueous extraction preparation, which is 40°C/12 hours, 60°C/6 hours, and 100°C/30 minutes were used and its antioxidant capacity were determined by using Ferric Reducing Antioxidant Power (FRAP), 1,1-diphenyl-2-picrylhydrazyl (DPPH), Total Phenolic Content (TPC) and Total Flavonoid Content (TFC) analysis. The extract with the highest antioxidants capacity from the optimum extraction setting was selected to be used in the animal trials. Twenty four fertile male Wistar albino rats, weight about 200 grams were randomly divided into 4 groups (n=6), and labeled as negative control (NEC) group, positive control (POC) group, PGR50 group and PGR800 group. Except to NEC group that was given distilled water as placebo, other groups were induced genitotoxicity by giving 200 mg/kg of bisphenol-A (BPA) via oral gavage. Rats in PGR50 and PGR800 groups were supplemented with 50 mg/kg and 800 mg/kg of *Phyllanthus gomphocarpus* root extract (PGR) respectively. Experimental period was set for 21 days. At the end of the experiment, rats were sacrificed; their sperm, blood and testes were collected for analysis. The results showed that PGR possessed high antioxidative properties characterized with lower temperature and longer time preparation. For the animal trial, both PGR supplementation groups were significantly increased most of the parameters including sperm concentration, motility, velocity, elongation, percentages of normal sperm morphology, serum testosterone (T), serum dihydrotestosterone (DHT) and the epithelial height of the seminiferous tubules compared to NEC and POC groups ($p < 0.05$). In conclusion, PGR extract possessed beneficial effect towards improvement of male infertility but the precise mechanism of action of PGR on male reproductive system is yet to be further explored.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

1.1.1 Male Infertility

Sexual dysfunctions (SD), such as erectile dysfunction, premature ejaculation, loss of libido and anorgasmia are detrimental to couples when not addressed properly. For a couple, the inability to have children is a personal tragedy and causes social stigmatization and personal frustration. According to the U.S National Institute of Health (NIH) (2013), about 40% of infertility problems in couples were caused by male factors with more than 15% of male infertility cases were due to low sperm quality. Even though numerous men were affected with this problem, only approximately 8% of them seeking for medical help (Khani, Bidgoli, Moattar, & Hassani, 2013).

Infertility problem were influenced by habit, lifestyle, chemical exposure or any psychological behaviour and these can be treated through counselling (Salonia, Matloob, & Gallina, 2009). Hormonal replacement therapies (HRT) were also introduced to increase the amount of androgenic hormones as well as spermatogenic process but there was lack of evidence available to prove the effect especially in men with idiopathic oligo-astheno-teratozoospermia problems (OAT) (Andreas Jungwirth, Giwercman, Tournaye, & Diemer, 2012). In addition, a wide variety of drug approaches also have not been effective in solving this problem (Andreas Jungwirth et al., 2012). Surgical treatment such as microsurgery has been shown to be more effective in improving pregnancy rate, however it require expertise and sophisticated instruments (Rimar, Trost, & Brannigan, 2013). Some studies suggested that antioxidant supplements in subfertile men may improve the outcomes of live birth and pregnancy rates with no side effects (Showell, Brown, Yazdani, Stankiewicz, & Hart, 2012). Profound and thorough research on the effectiveness of the antioxidant therapies against male infertility problems need to be carried out as ways in treating this male infertility problem effectively.