

Full Length Research Paper

Role of Lingzhi mushroom (*Ganoderma lucidum*) polysaccharide peptide (β -glucan) on sexual behaviour, testicle testosterone testis and mitotic index of old male Brown rat (*Rattus norvegicus*)

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Abstract

Late Onset Hypogonadism (LOH) is a syndrome characterized with decline in physical ability, sexual and psychological ability associated with decreased of testosterone in the blood. In middle age, around 45 – 59 years of age, reproductive function and hormones such as testosterone started to decline. In accordance with the increasing age, the testosterone production also decreased, which is known as the aging process. The increase of life expectancy also increases the number of elderly in the future. Thus, the elderly problems also increased. *Ganoderma lucidum* polysaccharide peptide which is known as β -Glucan has been used as traditional medicine in China and Japan for hepatitis, hypertension, chronic bronchitis, asthma bronchial, cancer and some other conditions. This study aimed to analyze the effect of β Glucan extract from *Ganoderma Lucidum* Polysaccharide Peptide (PSP) for 21 days compared to β Glucan ethanol extract of *Ganoderma lucidum* Polysaccharide Peptide (PSP) on sexual behavior, testosterone, and mitosis index of old male (*Rattus norvegicus*) rat testis. To determine male *R. norvegicus* sexual activity, it used CCTV incaged inside the cage made of acrylic for 21 days. Testicular testosterone was examined using immunohistochemistry. Mitosis index is evaluated using histological preparation with HE staining. Sexual activity of old male *R. norvegicus* rats was observed at 01.00 a.m. until 04.00 a.m. after treatment, the mean \pm standard deviation difference of the control group is 0.00 ± 0.866^a , the water extract / decoct mean 2.22 ± 1.394^b and ethanol extract 1.89 ± 1.269^b . Where significant value ($p < 0.01$). In studies of mitotic index old *R. norvegicus* mice testicular after being given a PSP *G. lucidum* extract ethanol = β Glucan, it had the highest with a mean value of 12.11 ± 2.759^c compared to decoction extract with a mean of 8.89 ± 1.364^b while at control, the lowest mean is 2.56 ± 1.333^a . There were significant differences in the average value of testosterone between groups with $p < 0.0001$. There was an increase in the mitotic index between groups, at the group of *G. lucidum* PSP ethanol extract, than the decoction extract of PSP *G. lucidum*.

Keywords: LOH, β Glucan *Ganoderma lucidum*, sexual behavior, Testosterone testes, mitotic index.

INTRODUCTION

Ganoderma lucidum has been one of favorite oriental medicine for centuries. Main fruit body is called *Lingzhi* in China and *Reishi* in Japan, used as traditional medicine for hepatitis, hypertension, chronic bronchitis, asthma bronchial, cancer, and some other conditions (Berović et al., 2003; Bohet al., 2007). One

study showed that plasma antioxidant associated with coronary heart disease biomarker profile increased after consuming *G. lucidum* for 10 days. The long term toxicity of *G. lucidum* in a study conducted by Gao and Han (2008) that shown it is safe to consume its capsule within dose range of 0.47 g/kg to 1.87 g/kg body weight.