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RESEARCH ARTICLE

THE EFFECT OF *GANODERMA LUCIDUM* POLYSACCHARIDE PEPTIDE (GLUCAN) ON CASPASE 8, CASPASE 9, AND APOPTOSIS, LEIDIQ CELL OF 18 MONTHS MALE RATTUS NORVEGICUS TESTIS

*¹Bambang Wasito Tjipto, ¹Aris Widodo, ¹Basuki Purnomo and ²WIBI Riawan

¹Medical Science Doctoral Program of Biomedical Interest Postgraduate Program of Faculty of Medicine,
University of Brawijaya, Malang

²Department of Biochemistry, Faculty of Medicine, University of Brawijaya, Malang

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ABSTRACT

Introduction: *Ganoderma lucidum* was reported contained several active components biologically, such as polysaccharides, triterpenes, sterols, proteins, peptides, amino acids, adenosine, oleic acid, vitamins and minerals. Vitamins were contained among B1, B2, C, niacin, and biotin. While the mineral content included potassium, sodium, calcium, magnesium, copper, germanium and some other makroelemen which totaled more than 200 active elements. Late Onset Hypogonadism (LOH) was a syndrome of physical abilities decline, sexual or psychological abilities associated with decreased testosterone in the blood. By middle age of 45-59 years of age the decline of bodily functions was started, including the decline of reproduction function and hormones such as testosterone, which was known as the aging process. With increasing life expectancy then so did the number of elderly in the future, the result will be increasing problems of the elderly.

Objective: This study aimed to analyze the effect of β Glucan extract *Ganoderma lucidum* Polysaccharide Peptide (PSP) in decoction way, in 21 days compared with β Glucan of ethanol extract of *G. lucidum* Glucan Polysaccharide Peptide (PSP), and control. On how was apoptotic of leidiq cell of 18 months male *rattus norvegicus* testes happened, whether through the pathway of caspase 8 (extrinsic) or through the pathway of caspase 9 (intrinsic).

Methods: To determine how was apoptotic of leidiq cell of 18 months male *R. norvegicus* testes happened, it used CCTV incaged inside the cage made of acrylic for 21 days. caspase 8, caspase 9, Mn SOD and apoptotic was examined using immuno histochemistry.

Results: At the studies of caspase 9, there was a meaningful difference to the mean in the control with mean of 7.78 ± 2.438^a on the water extract with mean of 4.89 ± 2.472^b , and the ethanol extract with mean 2.56 ± 1.333^c . with $p = 0.000$, ($\alpha < 0.001$) There was a decrease in the mean value of caspase 8 significantly in the ethanol extract is 3.56 ± 2.455^c , the water extract is 7.56 ± 1.424^b , meanwhile in control is 14.00 ± 2.598^a . It turned out that all the groups A, B, C each had an average of caspase 8 of rat testes Leidiq cells that different significantly with $p=0.000$, ($\alpha < 0.0001$). In apoptosis test on testicular Leidiq cells immunohistochemically, there was a decrease of apoptotic in the given of ethanol extract with a mean is 2.78 ± 1.202^c , compared to water extract / decoction with mean 5.22 ± 1.302^b , and control the mean apoptotic is 9.78 ± 1.716^a in average. It turned out that all the groups A, B, C each had different rat testis Leidiq cell apoptotic average significantly with $p = 0.000$, ($\alpha < 0.0001$).

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INTRODUCTION

Ganoderma lucidum was a favorite medicine in oriental medication for centuries. Fruiting bodies was called "Lingzhi" in China and "Reishi" in Japan. It had been known as a

traditional medicine, which was used in Chinese and Japanese traditional medicine for the treatment of several diseases, such as hepatitis, hypertension, chronic bronchitis, bronchial asthma, cancer and others (Habijani *et al.*, 2001; Boh *et al.*, 2007). A study demonstrated that antioxidants in plasma after consumption of *G. lucidum* was increased for 10 days, and it was associated with a trend PJK biomarker profile trend. The

*Corresponding author: Bambang Wasito Tjipto,
Medical Science Doctoral Program of Biomedical Interest Postgraduate
Program of Faculty of Medicine, University of Brawijaya, Malang