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Polysaccharide Krestin Activity from *Coriolus versicolor* on Antibody Titer of Mice Exposed *Staphylococcus aureus*

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Abstract – (The best know commercial polysaccharopeptide preparations of *Coriolus versicolor* are polysaccharopeptide krestin (PSK). One of the most important functions of PSK is their immunomodulatory actions. The purpose of this study was to analyze the activity of polysaccharides krestin on antibody titer in *Mus musculus* exposed to *Staphylococcus aureus*. Polysaccharide krestin was fractionated and precipitated with 90% ammonium sulphate. Polysaccharide krestin was given on the mice strain Balb/C. There was six treatment groups: (K) control, without adding PSK and without was exposure to *S. aureus*, (K +) positive control, adding PSK, (K -) negative control, exposure to *S. aureus*, (P1) adding PSK before exposure to *S. aureus*, (P2) adding PSK after exposure to *S. aureus*, and (P3) adding PSK before-after exposure to *S. aureus*. Polysaccharide krestin dose was 50 mg/kg bw administered for 7 days via gavage. Exposure to *S. aureus* done 2 times with an interval of 2 weeks via intraperitoneal. Antibody titer were measured by ELISA. Data were analyzed by descriptive. The results showed that the polysaccharide krestin increased the antibody titer on P1. Polysaccharides krestin could stimulate the immune response resulting from exposure to *S. aureus.* Polysaccharides krestin can be useful as immunomodulator).

1. INTRODUCTION

Staphylococcus aureus is the extracellular bacteria that live in humans, such as respiratory tract and cutaneae. The infection will occur when the immune response is down, for example, there are hormonal changes; illness, injury, use of steroids or drugs that affect immunity. The bacteria produce enzymes, protein A, and toxins that can protect bacteria from phagocytosis and cause hemolysis [1]. Bacteria cause the skin infections, acute inflammation by toxins, and cell death caused by pore-forming toxins [4]. The extracellular bacterial internalization by the APC as macrophages, dendritic cells, B cells in association with MHC II. CD4 + T cells respond to these associations and produce cytokines. Cytokines can stimulate the production of antibodies, induces local inflammation, increase phagocytosis, and activates macrophages [4].

Coriolus versicolor is medicinal mushroom used in Japan, China, Korea and other Asian countries. *Coriolus versicolor* has antimicrobial, antiviral, anti-tumor, and stimulatory effects on the immune system properties. It is called a biological response modifier (BRM)[2]. In vitro, yeast extract *C. vesicolor* effectively stimulate the activity of T lymphocytes, B lymphocytes, monocytes / macrophages, bone marrow cells, NK cells, and killer cells depends lymphocytes. Mushrooms also stimulate proliferation and or production of antibodies and a variety of cytokines such as IL-2, IL-6, intreferon, and TNF [6].

Polysaccharide krestin is extraction product of *Coriolus versicolor.* The active ingredient is a polysaccharide (β-glucan). Polysaccharides are arranged in combination with krestin protein. The combination known as polysaccharide krestin (PSK) [2]. Powdered polysaccharide krestin contain 34 – 35 soluble carbohydrate (91 – 93% *β*–glucan), 28 – 35% protein, 7% moisture, 6 – 7% ash, and the reminders are free sugars and amino acids [3]. PSK has a physiological activity include immunopotentiating by inducing the production of interleukin-6 (IL-6), interferon and immunoglobulin-G, suppress the immune response (immunosuppression), increased appetite and improve liver function, calm the central nervous system, and increases the pain threshold [3,4]. The purpose of this study was to analyze the activity of polysaccharides krestin on antibody titer in *Mus musculus* were exposed to *S. aureus*.

2. METHODS

2.1 Production of *C. versicolor* extract, isolation, and purification of PSK

Mushrooms of C. versicolor *was washed with water, then air-dried. Mushrooms were cut into small pieces and put in oven at 40^{0}C for 24 hours. Mushrooms were mashed into a coarse powder. Coarse powder were made*