Polysaccharide Krestin Activity of Coriolus versicolor Extract on Interleukin-12 Level of Mus muculus Exposed to Mycobacterium tuberculosis

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Abstract. This study aimed to determine the effect of polysaccharide krestin (PSK) of *Coriolus versicolor*'s extract on IL-12 levels in the *Mus musculus*'s blood serum that had been exposed by *Mycobacterium tuberculosis*. This study used a completely randomized design were divided into six treatment groups. They were K (control group without treatment), K+ (positive control by providing PSK), K- (negative control with exposed *M. tuberculosis*), P1 (treatment using PSK before exposured by *M. tuberculosis*, P2 (treatment using PSK after exposured by *M. tuberculosis*), and P3 (treatment using PSK before and after exposured by *M. tuberculosis*). PSK given concentration was 200 mg/kg bw, while the number of bacteria for exposure was 0.25 Mc Farland with double exposure. Each treatment there were four replicates. Blood serum of mice were isolated and measured levels of IL-12 by ELISA kit. Data analysis used Brown Forsythe test. The results showed that the highest levels of IL-4 was K-. PSK administration in the treatment of P1, P2, and P3 showed the levels of IL-12 not significant with the K and K +. Conclusion of the study was the treatment using PSK had no effect on the level of IL-12 in *Mus muculus* exposed by *M. tuberculosis*.

INTRODUCTION

Tuberculosis or TB is an infectious bacterial disease caused by *Mycobacterium tuberculosis*, which most commonly affects the lungs. It is transmitted from person to person via droplets from the throat and lungs of people with the active respiratory disease. The symptoms of active TB of the lung are coughing, sometimes with sputum or blood, chest pains, weakness, weight loss, fever and night sweats [Departemen Kesehatan RI, 7].

In healthy people, infection with M. tuberculosis Often causes no symptoms, since the person's immune system acts to "wall off" the bacteria. Tuberculosis can be treated with antibiotics for 6 months in a row. It is important to look for other alternative materials that can be used to enhance the immune response to tuberculosis.

Medicinal mushrooms have an established history of use in traditional oriental therapies. Modern clinical practice in Japan, China, Korea, and other Asian countries continues to rely on mushroom. Mushrooms effects have been demonstrated for many including extracts of species from *C. versicolor* [Ooi & Liu, 14].

It is well established that many mushroom-extracted compounds are commonly used as immunomodulators or as Biological Response Modifiers (BRM). The basic strategy underlying immunomodulation is to identify aspects of the host response that can be enhanced or suppressed in such a way as to augment or complement a desired immune response. Whether certain compounds enhance or suppress immune responses depends on a number of factors, including dose, route of administration, timing of administration of the compound, mechanism of action, and site of activity. Knowledge of the specific components of cytokine networks and signaling pathways and their role in the regulation of immune responses is important in designing strategies to augment these responses.

C. versicolor extract can increase the number of leukocytes, macrophages and spleen weight [Wahyuningsih, 20], the provision of PSK from *C. versicolor* increase the number of immunocompetent cells, increase immune response non-specific and specific due to infection with M. tuberculosis (Wahyuningsih *et al*., 21). The active compounds contained in mushrooms is β-glucan [Guggenheim, 9; Moradali *et al*., 13].

β-Glucan is known to stimulate the formation of pro-inflammatory mediators such as complement components, interleukin 1 (IL-1), tumor necrosis factor (TNF-α), interleukin 2 (IL-2) and eicosanoids [Yu *et al.,* 27]. β-Glucan increases the production of IL-2, which stimulates the differentiation of B cells activated [Vetvicka *et al*., 24]. In this study, administration of PSK done in three different time ie