Strengthening Defenses: Analyzing the Immunomodulatory Potential of Beta-Glucan of Ordinary Mushrooms in Coffee

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Our body has many ways to defend itself against foreign pathogens with the first defense being our innate immune system. Among the many different substances that can improve our immune system's efficiency, I analyzed the polysaccharides Beta-glucan, present in the cell walls of mushrooms. This substance can increase the metabolism of the immune system cells such as macrophages and T-cells. Utilizing gravimetric methods along with isopropyl alcohol, I measured the amount of beta-glucan present in common edible mushrooms and created a guide for people seeking natural immune-boosting alternatives, concluding that the mushrooms with the highest concentration were Lion’s Mane and Shiitake. However, the incorporation of mushrooms into the diet of consumers might be difficult, considering personal tastes, therefore, I decided to incorporate Beta-glucan, in coffee; one of the most consumed drinks in the world, especially by those under stress and the elderly population, whose weakened immune system would benefit. In my analysis, I utilized UV-visible spectroscopy to calculate the concentration of Beta-glucan in the coffee sample after utilizing different methods of preparation and incorporation. I concluded that even though the concentration of Beta-glucan in the coffee samples was lower than compared to a pure supernatant, it was higher than a pure coffee sample. Based on the conclusion above, I believe that this project has the potential to impact the lives of many people in the future by increasing the effectiveness of our innate immune system by utilizing natural resources without significant modifications to our diets.

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