

Extraction and purification of lectins from mushroom and study its agglutination activity

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Abstract

Lectin is a type of protein that found in most common kinds of nutrients. The human body is unable to digest it, therefore lectin passes through a gastrointestinal tract and linked to sugar. It is importance lactin bind to have an immune response, as it gains the body's immunity, meaning it is used as an antioxidant. To extract lactin protein from mushroom, the worked utilized 1 kg of mushroom for all three steps. The first step involved cell destruction and extraction by transferring 1kg of mushroom into distilled water (100 mL), and the addition of sodium chloride (11.7 g) in mixer then filtered by gauzes and filter paper. The second step includes precipitation process using five different concentrations of ammonia sulphate of (20, 40, 60, 80, 100 %) for 50 mL of the extract mushroom. The final step involved dialysis by semipermeable membrane made of cellulose acetate or nitrocellulose. The result of extraction process is indicated by spectrophotometer from measurement the sample that precipitated using ammonia sulphate. Moreover, the extracted, the purified lectin protein from fungi was utilized as antibiotic against diseases.

Key Words: Extraction, purification, mushroom, agglutination.

Introduction

Lectins are proteins that bind specifically to both free and cell surface attached carbohydrates. This property may trigger various cellular responses and confers to these proteins several biological activities [1, 2]. In plants, lectins are reported to be

involved in defense against pathogens, herbivores, and predators. This physiological role has stimulated the investigation of their biotechnological potential in the control of microbial infections and pest insects [3, 4]. Lectins with antibacterial activity can interact with peptidoglycans, lipopolysaccharides

and other molecules present in the cell wall of Gram-positive and Gram-negative species, interfering with cell growth and viability as well as blocking interaction sites with host cells preventing infection [5, 6]. Lectins also exert antifungal effect, which may be linked to interaction with chitin, cellulose, glucans and mannoproteins present in the cell wall, interfering with fungal growth, cell homeostasis and spore germination [7-9].

Experimental Part

Protein extraction was originally done by using 1 Kg of mushroom and following general steps. Cell distraction and extraction by mixer, gauzes and filter papers. Precipitation using Ammonia sulfate. Dialysis by semipermeable membrane made of cellulose acetate or nitrocellulose. Purification by Ion exchange as well as size exclusion between the steps. Moreover, the protein activity was measured continuously during the experimental steps.

Results

The result showed that blood group A appear more homogenized than other blood groups this is because blood group blood A contain three special receptor as mentioned earlier hemagglutination activity [HA] was expressed as the reciprocal of the lowest

dilution showing agglutination result of agglutination assays showed that [HA] differed among the different group B,O further assessment was carried out with molecular docking program to evaluate whether the proposed interaction are not only structurally possible but also energetically favorable upon initial molecular docking experiment employing auto docking the crude extract were assayed for lectin activity expressed as hemagglutinating activity [HA] using corning ware tm 96 well micro titer U-plates the human red blood cells [RBCs] obtain from the Laredo medical center [LMC] laboratory department used in these assays were postpartum blood sample screened negative for both [HIV] and blood born communicable disease RBCs were washed with 0.01 M phosphate buffered saline (0.15 M, pH 7.2) and the lactin this is a type of protein found in most type of food a person can digest it so it passes through the digestive channel it is related to sugar the way he worked different Beym Kala lactin bind to the cells in the intestine which allows the cell to respond immune meaning and its guest the body gains its immunity it means an antidote is used. This picture is appeared agglutination bulbs in blood (A.B.C) human with lectin precipitation mushroom.

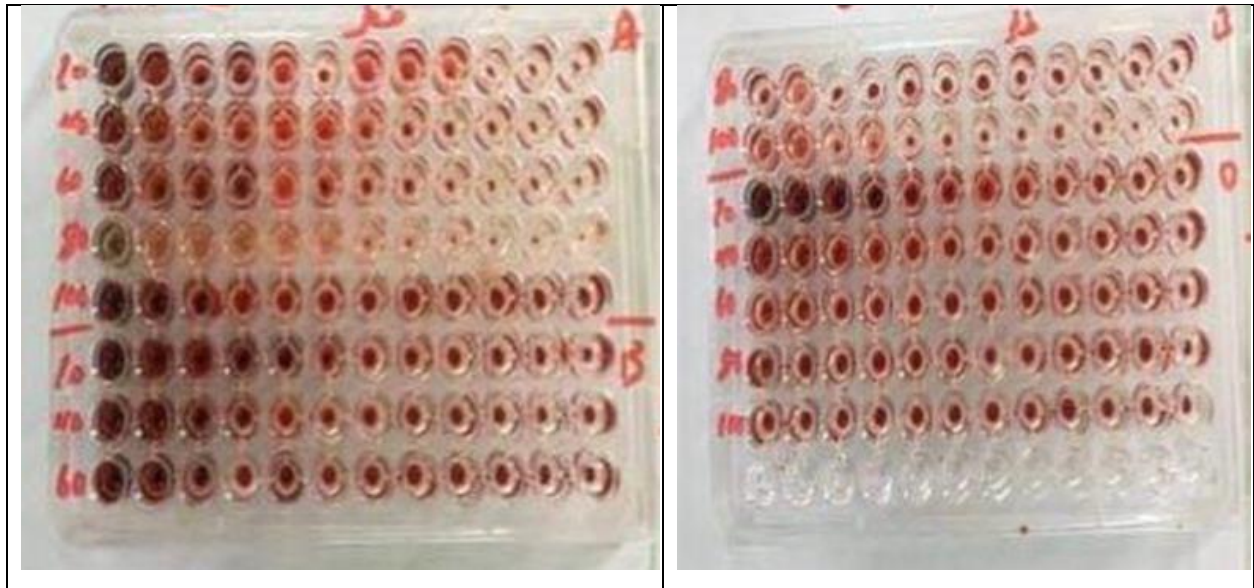


Figure 1: (Left) Mushroom with A, B blood class. (Right) Mushroom with O blood class.

Quantity estimate: the result is show by spectrometer against the measurement sample that precipitated using ammonia sulfate. Collect each sample after estimating

effective in tube and measurement in spectra. The recorded results were listed for each sample in table 1.

Table 1: Sample concentration ammonia sulfate Reading spectrophotometer.

Sample Concentration	Spectrophotometer results
20	3
40	2.856
60	0.800
80	0.688
100	0.686

Table 2: The estimate effective with blood group human this table is show result precipitation by concentration ammonia sulphate this number is dilution for agglutination lectin with group blood.

Sample	Blood group concentration	Concentration of ammonia sulphate	The resulted agglutination dilution
Mushroom	A	20	1/656
		40	1/128
		60	1/64
		80	
		100	1/32
	B	20	1/128
		40	1/32
		60	1/16
		80	1/2
		100	1/8
	C	20	1/128
		40	1/32
		60	1/4
		80	1/2
		100	

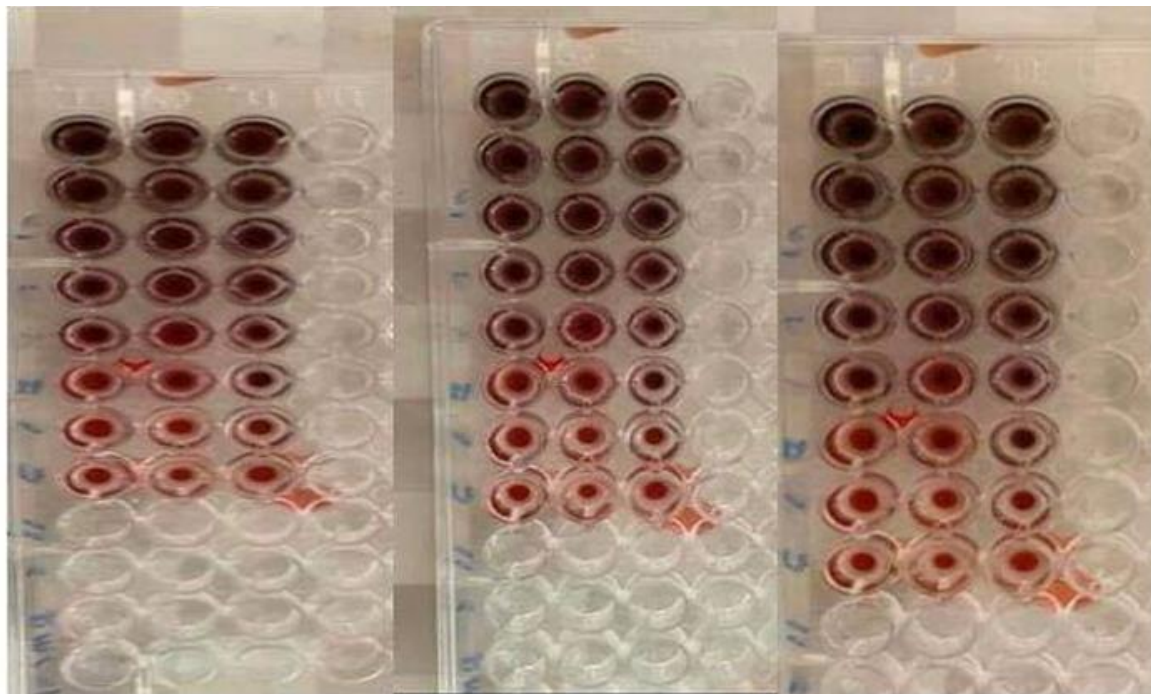


Figure 2: The agglutination bubbles the blood is appear rang about pit micro tube.

Conclusion:

From our study we concluded after experience the experiments conducted on blood group that blood group A appear more homogenized than other blood groups this is because blood group blood A contain three special receptor this means that people with

blood group A are more responsive to the vaccine. The result is show by spectrophotometer from measurement sample precipitation by ammonia sulphate collect each sample after estimating effective in tube and measurement in Spectro accord result where is app.

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