

**Study of Anticholesterol Activity of Probiotics.****\*Rohan Virendra Yadav<sup>1</sup>, Jaee Ravindra Deshmukh and Birendra Singh Yadav**<sup>1</sup>Department of Zoology,

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**Received : 25.02.2020; Accepted : 22.04.2020****ABSTRACT**

Probiotics are live microorganisms that give medical advantages when taken as food. It improves and reestablishes the gut flora. Elevated cholesterol is a noteworthy hazard factor for coronary illness and a reason for respiratory failures. A development of cholesterol is a piece of the procedure that narrows arteries, called atherosclerosis. In atherosclerosis, plaque accumulates and causes limitation of blood flow. The extension for wellbeing advancement of probiotics, for example, LAB has in this manner been augmented past the improving of intestinal wellbeing, additionally to incorporate enemy of weight, against diabetic and cholesterol-bringing down impacts. In the present study as per the protocol provided in the cholesterol estimating kit initial cholesterol values were determined. After completion of incubation period the amount of cholesterol was estimated. In this study we investigated the cholesterol-lowering potential of LAB strains, out of 6 LAB strains *S.lactis* showed highest percentage of reduction in cholesterol level.

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KEY WORDS : Atherosclerosis, Cholesterol, LAB, *S.lactis*.**Introduction**

Probiotics are defined as living microorganisms that confer health benefits, when they are administered in adequate amounts and it is widely used nowadays. High cholesterol is a significant risk factor for coronary heart disease and a cause of heart attacks. Cardiovascular disease poses a serious threat to human life, and 17.9 million individuals died from cardiovascular disease in 2015, which rose by 12.5% since 2005. (Heart Disease and Stroke Statistics—2017 Update, A Report From the American Heart Association) Epidemiological studies have confirmed the correlation between total cholesterol (TC) with increased cardiovascular risk. Apart from pharmaceutical approaches, probiotics therapy also showed a potential effect in TC regulation. Decrease of serum cholesterol can bring down the frequency of coronary thrombosis in hypercholesterolemic people. Several investigators have suggested that certain Lactic Acid Bacteria are capable of reducing cholesterol. Therefore, probiotics triggered a great interest among researchers to treat cardiovascular disease. The use of probiotics as a biological procedure of cholesterol reduction is increasing rapidly although most probiotic products in the market are derived from animal products,

mainly milk. The ability to *in vitro* uptake of cholesterol level in model culture media has been yet shown for numerous strains of *Lactobacillus* genera, such as *L. acidophilus*, *L. fermentum*. Adhesion of cholesterol to cell surface and incorporation of cholesterol into cellular membrane are the most frequently suggested mechanisms of LAB's activity on cholesterol level. This raised an assumption that similar phenomenon may also take place in human GUT.

In the present study we have studied that after treating the Serum with CHO *in vitro* conditions, sufficient reduction in serum cholesterol levels was observed.

**Material and Methods****1. Effect on serum cholesterol:**

Kit for estimating serum cholesterol, Serum sample, Purified CHO enzyme

**2. Effect on serum cholesterol (*in vitro*):**

As per the protocol provided in the kit to estimate serum cholesterol the initial cholesterol values were determined. Then the serum was treated with the purified enzyme sample *i.e.* 5µl and kept for incubation at 37°C for 30 min. After completion of incubation period the amount of cholesterol was estimated with the help of kits.

$$\text{Cholesterol concentration } \frac{\text{mg}}{\text{dl}} = \frac{(\text{absorbance of test})}{(\text{absorbance of standard})} \times 200$$

**TABLE-1 : Working protocol for testing serum with purified and diluted enzyme sample.**

Additions	Quantity in $\mu$ l								
	A	B	C	D	E	F	Normal	Standard	Blank k
Serum	10	10	10	10	10	10	10	-	-
Purified CHO samples	5	5	5	5	5	5	-	-	-

**Incubate for 30 min at 37°C**

Reagent 1	1000	1000	1000	1000	1000	1000	1000	1000	1000
Reagent 2	-	-	-	-	-	-	-	10	-

Incubate for 10 min at 37°C and the absorbance measured at 505 nm.

**TABLE-2 : Observation of treatment of serum with CHO enzyme.**

Additions	Concentration of cholesterol mg/dL					
	A	B	C	D	E	F
Purified enzyme sample	0.12	0.24	0.27	0.18	0.14	0.11

(\*Absorbance of cholesterol in normal serum was 0.43)

**TABLE-4 : Percent reduction in serum cholesterol levels.**

Additions	Percent reduction in serum cholesterol levels (%)					
	A	B	C	D	E	F
Purified enzyme sample	65.72	45.72	42.86	48.58	60.01	68.51

### Observations

Effect on serum cholesterol (*in vitro*) A: *Lacto.Bulgaricus*,

B: *Lacto.acidophilus*,

C: *Lacto.fermentum*,

D: *Lacto.brevis*,

E: *Lacto.casei*,

F: *S. lactis*

**TABLE-3 : Results of serum treated with CHO enzyme.**

Additions	Concentration of cholesterol mg/dL					
	A	B	C	D	E	F
Purified enzyme sample	55.81	88.51	93.02	83.72	65.11	51.16

(\*Concentration of cholesterol in normal serum was 200mg/dL)

### Results and Discussion

Selected probiotic lactobacilli may be used as biological preservative, so, the aim of this study was to present some data on lactobacillus as probiotic bacteria, Information recently published by the Lipid Research Clinics, indicates that the higher the total serum cholesterol level is in humans, the greater the risk of developing coronary heart disease. Some studies have reported that ingestion of probiotics such as *S.lactis*

decreases serum cholesterol levels in humans and animals. However, the study also showed the need for ingestion of the organisms in order to keep them in adequate numbers so as to effect health benefits to the host. In this study we investigated the cholesterol-lowering potential of LAB strains, out of 6 LAB strains *S.lactis*

shown highest percentage of reduction in cholesterol level.

### Conclusion

From the present study we can conclude that after treating the Serum with CHO *in vitro* conditions, sufficient reduction in Serum cholesterol levels was observed.

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