

## Purification and Evaluation of Lectin-like Protein from *Terminalia catappa* (TC) Seeds for its Physicochemical and Antimicrobial Properties

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### INTRODUCTION

Lectins are ubiquitous in nature, found in all forms of life, particularly abundant in plant sources such as nuts, grains, beans, and seeds. Plant lectins have garnered significant attention due to their wide distribution and applications as glycoconjugates. Lectins exhibit a range of biological activities, including anti-tumor, anti-diabetic, antibacterial, antifungal, and antiviral properties.

The objective of this research was to study the purification and characterization of lectins extracted from TC seeds. The process involved isolating and purifying the lectin, followed by a comprehensive assessment.

### METHOD

Extraction, Purification and Characterization of lectin.

Effect of pH, Temperature, Metal ion, Sugar specificity test. Preliminary test for Antimicrobial activity.

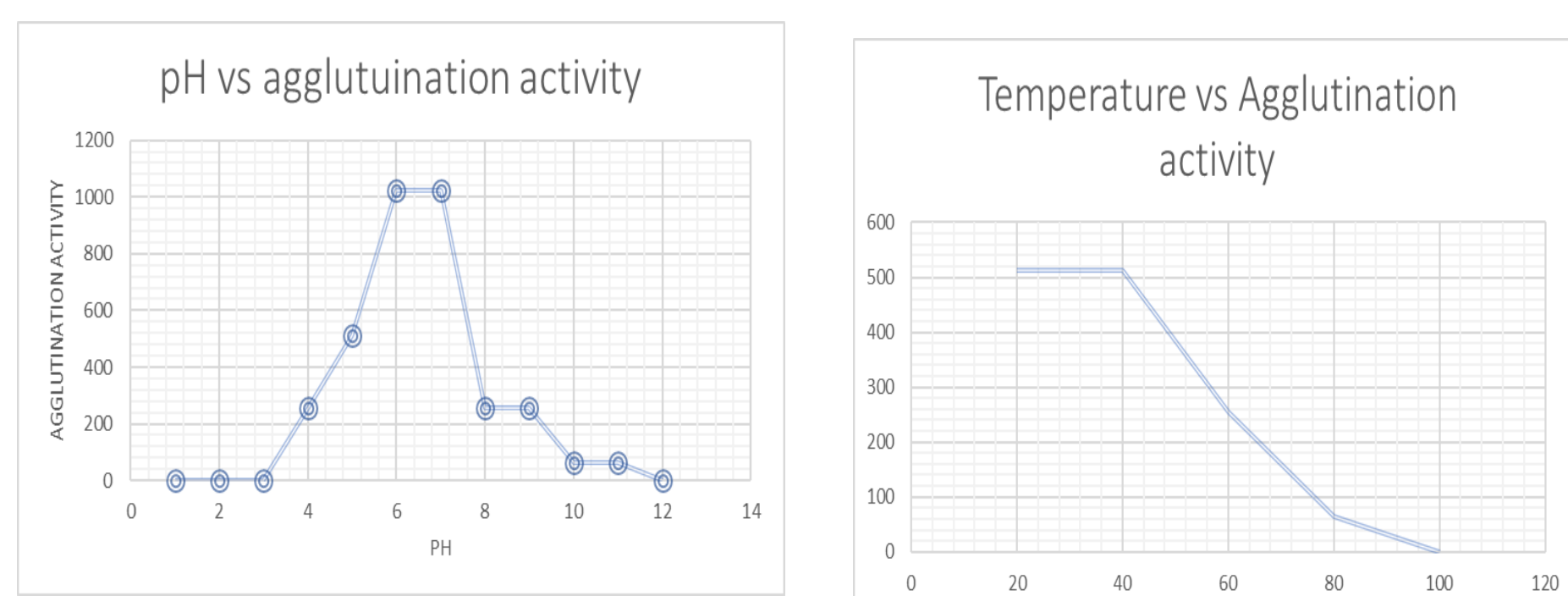


Figure: 1.1 & 1.2 : Graph of Effect of pH and Temperature vs Agglutination activity.

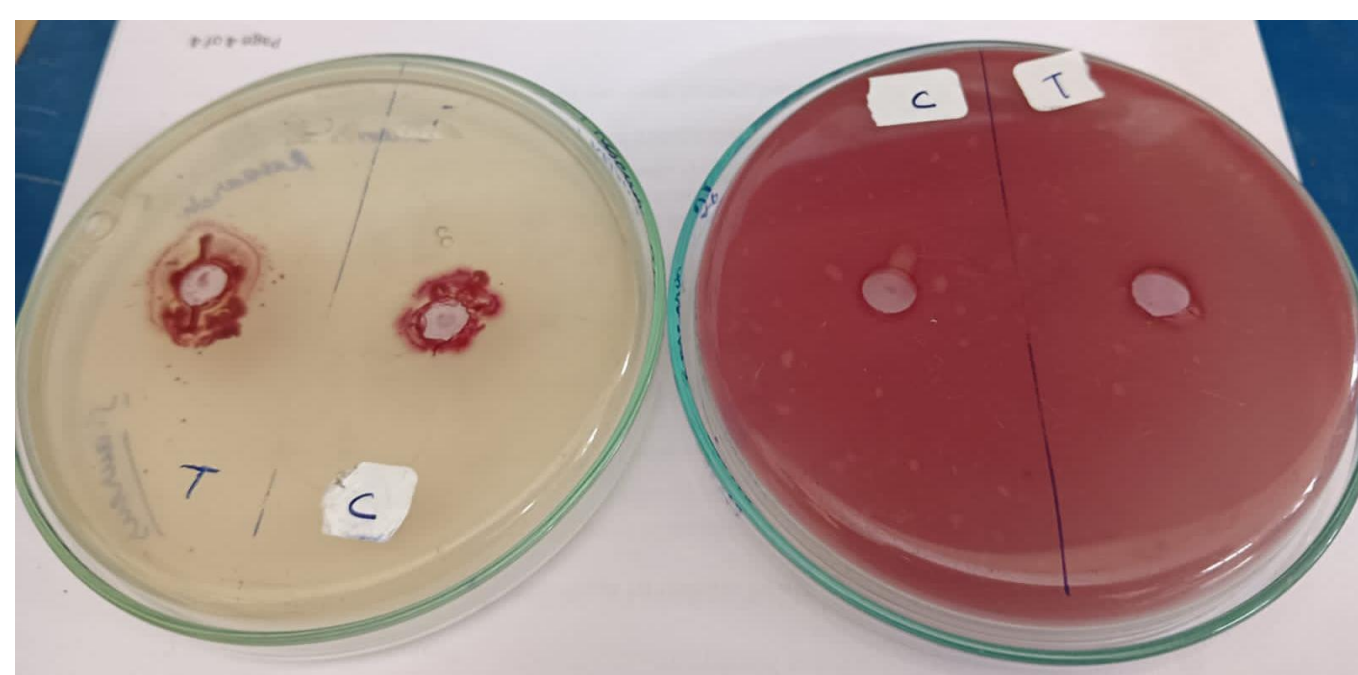


Figure: 2.1& 2.2 Antimicrobial activity of *S.aureus* and *E.coli*

### RESULT AND DISCUSSION

The lectin from TC seeds was partially purified using ammonium sulfate precipitation and dialysis. It strongly agglutinates human erythrocytes, especially those of blood group B, and its peak activity occurs at pH 7-8 and temperatures of 20-40°C shown in fig. 1.1 & 1.2. It binds specifically to D-Galactose and D-Lactose, and is responsive to  $Ca^{2+}$  and  $Mg^{2+}$ , but not  $Hg^{2+}$ . Additionally, it exhibits antimicrobial activity against *E. coli* and *S. aureus* shown in fig: 2.1 & 2.2.

### CONCLUSION

The lectin purified from TC seeds exhibits specific carbohydrate-binding properties and maintains stable activity over a moderate range of temperatures and pH levels. These versatile proteins are essential for treating illnesses, serving as therapeutic agents, and acting as disease biomarkers. These characteristics indicate a promising potential for their use in biochemical and medical research, particularly in areas related to carbohydrate recognition and blood group specificity.

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### CONFLICT OF INTEREST

The Authors declare no conflict of interest.