

Thesis Title            A Search for Beta-Hemolytic Streptococcal  
 Agglutinating Lectins Isolated from  
 Various Plants

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#### ABSTRACT

A detection of lectins from 38 tropical Thai plants belonged to 7 families was performed by conventional methods including salt extraction, protein fractionation and screening for hemagglutinating activities with human erythrocytes, and 18 plant extracts showed erythroagglutination. Only 14 of these plant extracts had relatively strong hemagglutinating activities ranging from 80 to 2560 units/mg protein and were used to determine agglutinating activities with 134 strains of beta-hemolytic streptococci groups A,B,C,D, and G which had been proved by the conventional biochemical tests and serological grouping. It was found that two crude lectins extracted from the table tomato fruit (*Lycopersicon esculentum* Var. *Sida*) and from the job's tear seed (*Coix lachryma-jobi*) were able to agglutinate beta-hemolytic streptococci groups B and C, respectively. Tomato lectin agglutinated 37 of 39 group B with 94.87% sensitivity; whereas job's tear lectin agglutinated all of the 26 group C strains (100% sensitivity) and each did not react with any other streptococcal serogroups (100% specificity). The carbohydrate-binding specificity of both crude lectins as determined by bacterial agglutination inhibition assay indicated a specificity of the tomato lectin for a repeating unit of N,N',N''- triacetylchitotriose, and of the job's tear lectin for N-acetyl-galactosamine.

Since the lectin offers many profound advantages not only in cost and ease of production but also in its high specificity compared with other presumptive tests, in addition it is stable to high temperature and has a long shelf-life, the lectins extracted from tomato and job's tear plants reported in this study may assume a prominent role in routine laboratory procedure for the simple and rapid screening of groups B and C beta-hemolytic streptococci from the primary isolation media.