ABSTRACT

A lectin which binds specifically to oligosaccharides of N-acetyl-D-glucosamine was purified from the whole ripe Sida tomato fruits (Lycopersicon esculentum Variety Sida) by salt extraction followed by ammonium sulfate precipitation, and affinity chromatography on an ovomucoid-agarose column. The homogeneity of the lectin was checked by polyacrylamide gel electrophoresis. The lectin migrated as a single band in SDS-polyacrylamide gel electrophoresis with a mobility corresponding to a molecular weight of 71,000. The lectin was found to be a glycoprotein that contained 63 % protein and 37 % carbohydrate. The amino acid analysis revealed high serine, proline and half-cystine contents but lacked tryptophan. Sugar analysis revealed an abundance of arabinose (75 %) and fructose (25 %). The lectin had no human blood group specificity. Furthermore, agglutination was enhanced by trypsin treatment of erythrocytes. The erythroagglutinating activity was very high since the minimal concentration needed to agglutinate erythrocytes was 0.02 ug/ml. The saccharide specificity of the Sida tomato lectin was related to oligomers of N-acetyl-D-glucosamine, and N,N',N''-triacetylchitotriose was the most powerful inhibitor. The lectin was also relatively resistant to heat denaturation up to 70°C . From these properties, it would seem that the Sida tomato lectin is closely related to, but not identical with the lectin from the common tomato, a different variety reported previously by other investigators.

The purified tomato lectin was coupled to polystyrene particles to be used as detective reagent in the slide agglutination test for the non-serological identification of group B beta-hemolytic streptococcal cultures grown in broth. A total of 310 beta-hemolytic streptococci were tested and all isolates were also identified by the standard presumptive or serological latex agglutination tests. In a blind study, 151 of 160 group B streptococci were correctly identified by the lectin-latex reagent with a sensitivity of 94.38 %. None of the 150 non-group B or other serogroups of beta-hemolytic streptococci caused agglutination (100 % specificity). The predictive value of a positive and a negative test was 100 %, and 94.34 %, respectively. The efficiency of the test was 97.10 %. The findings indicate that the test using Sida tomato lectin-bound latex reagent is inexpensive, rapid, reliable and easy to perform; and its high specificity and positive predictive value obtained in this study lead us to suggest a role of this reagent as an adjunct to culture in the diagnosis of group B beta-hemolytic streptococci in admission body fluids or in vaginal specimens.