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Evaluation of Allergenicity of Salt-Soluble Proteins in Plant Seeds

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Summary

Soybean is an important food in many countries. However, it is one of major foods causing food allergy in childhood. Soybean seeds contain a lot of salt-soluble proteins, which named as globulin. In this study, we evaluated the allergenicity of soybean globulin. We purified two types of globulins, 7S and 11S globulins, from soybean seeds. In addition to salt-soluble proteins, we purified recombinant proteins of soybean defense-related protein, trypsin inhibitor, and oleosin (a structural protein for a storage lipid droplet). Sera of 28 patients who were confirmed clinically as soybean allergy were used. IgE antibody values specific for these proteins were measured by ELISA methods. Sera from all patients exhibited relatively high values for both 7S and 11S globulins. The average specific IgE values calculated from 7S and 11S globulins is highly correlated to that for soybean extracts. This means that IgE antibody value specific for soybean extract in patient sera account for those for globulin. On the other hand, IgE antibody specific for defense-related protein, trypsin inhibitor and oleosin were detected in sera of several patients. These results suggest that globulins are a major allergen in soybean allergy and many kinds of soybean proteins are potential to be an allergen. In the future, the analysis of an allergenicity of globulins at subunit level is expected, because a subunit composition of soybean globulins is complicated.