LECTINS IN THAI PLANTS : PURIFICATION AND CHARACTERIZATION OF A LECTIN FROM JACK FRUIT (*Artocarpus heterophyllus*)

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ABSTRACT

The seeds of Thai plants were screened for new lectins using hemagglutination and sperm agglutination tests. Among thirty-one kinds of seeds, one kind of storage root, and one kind of stem tested, fifteen kinds of seeds showed agglutinating activities. Most of the active seed extracts were from family Leguminosae. Other active seed extracts were from family Moraceae, Sapindaceae, Gramineae, and Cucurbitaceae.

Seed extracts from Jack fruit, red kidney bean, broad bean, and garden pea agglutinated rat sperm, human sperm and human erythrocytes. Sa-taw, soybean, and yard-long bean seed extracts agglutinated only rat and human sperm but not human erythrocytes. Seed extract from rambutan agglutinated rat caput epididymal sperm and human erythrocytes while seed extract from longan reacted only with caput epididymal sperm. The extract from tamarind agglutinated rat sperm and human erythrocytes but not human sperm. Seed extract from balsam pear agglutinated only human red blood cells.

Jack fruit lectin was purified from the crude seed extract by ammonium sulfate fractionation followed by affinity chromatography on a column of Affigel-galactosamine. The purified Jack fruit lectin was sensitive to pronase and bound specifically to N-acetylgalactosamine. By gel filtration, the molecular weight of the native lectin was 42,000. By SDS-PAGE, the lectin was found to compose of two dissimilar subunits with molecular weight of 18,000 and 13,000. The

small subunit existed in greater amount than the large one. A trimeric structure consisting of two small and one large subunits was proposed as the structure of the Jack fruit lectin. By non-denaturing polyacrylamide gel electrophoresis, the lectin showed multiple forms with charge heterogeneity. Jack fruit lectin also cross-reacted with anti-*Maclura pomifera* lectin and mediated mixed patterns of sperm agglutination : head-to-head, head-to-tail, and tail-to-tail.