

CHAPTER 1

INTRODUCTION

Sato has scientific name as *Parkia speciosa* Hassk. The other names are กะตอ (Kato), สะตอ (Sato), ตอดาน (To dan), ตอข้าว (To khao), (Central) ปะตอ (Pa-ta), ปัดเต้า (Pat-to), (Malaysia, Yala, Pattani), ปาด (Pa-tai) (Malaysia, Satun). Sator found in many countries in South East Asia such as Malaysia, Indonesia, Brunei and Thailand.

Parkia speciosa Hassk^{31, 32} is in the family of Leguminosae that found in the northern part of Malaysia as well as in the southern part of Thailand. Sato has 2 types. They are sato khao and sato dan. It is a perennial plant that is 30 meters long. A large tree which can reach 40-50 centimeters tall. Leaves are twice pinnate, with 10-19 pairs of opposite, pinnate leaves. Each pinnate leaf, 15-30 centimeters long, has many pairs of small, sessile leaflets. Flowers which are small and creamy white are found in densely crowded heads. Pods are large, 40-55 cm long and 4-5 cm wide, straight or more commonly twisted, dangling in small bundles, green becoming black. Each pod contains 10-18 large seeds. The pods taste like garlic and have a very strong odour.

The immature seeds, young leaves and fresh parts of the flower stalks can be eaten raw. Half-ripe pods are pickled in salt. In the current, Sator is a famous vegetable for eating and business because it has high nutriment and has many medicinal qualities. For example, it can reduce blood pressure and anti-diabetic. The beans have a laxative effect and anti-diabetic³³.

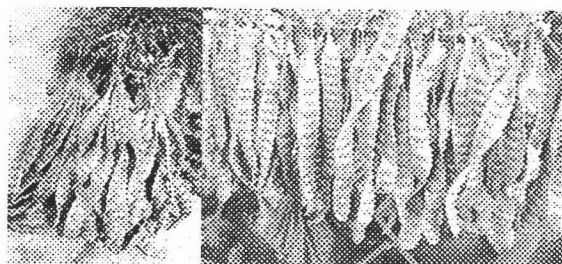


Figure 1.1 Sato (*Parkia speciosa* Hassk)

Objective

The objective of this work is in order to characterize proteins from the seeds of *Parkia speciosa* Hassk (Sato).

Scope of work

In initial work, Precipitation of proteins from *Parkia speciosa* Hassk. The Con A affinity fraction will be separate and determined the molecular weight of proteins by SDS-PAGE. The affi gel blue gel fractions were purified by gel filtration chromatography and HPLC and then determined molecular weight by 1D SDS-PAGE and MALDI-TOF MS. After that, proteins in SDS-PAGE gel No. C2a, C2b, C1a, A1 and Gj fraction from gel filtration chromatography will be sequenced by MALDI-TOF MS.

Literature Review

Lectins of *Sauromatum venosum* were isolated by phosphate buffer pH 7.2 and were separated by affinity chromatography. The molecular mass determined by gel filtration chromatography was 54 kDa. In size exclusion and cation exchange chromatography, *S. venosum* lectin (SVL) gave a single peak and also a single band of 13.5 kDa in SDS-PAGE. SVL agglutinated rabbit, rat, sheep and guinea pig erythrocytes but reacted with goat and human ABO blood group erythrocytes after the neuraminidase treatment².

Parkia speciosa seed lectin was purified from a crude extract by $(\text{NH}_4)_2\text{SO}_4$ fraction followed by specific adsorption on Sephadex G-100 and subsequent displacement with D-glucose. The molecular weight of purified lectin determined by gel filtration was 46700 and 47300 Da by denaturing gel electrophoresis. The lectins agglutinated rat erythrocytes but not those of humans. Sugars which specifically bind with the lectin were tested by hemagglutination inhibition with D-glucose, D-mannose, D-fructose, maltose, *N*-acetyl-D-glucosamine, α -methyl-D-glucopyranoside and methyl- α -D-mannopyranoside. Amino acid compositions of lectin are glycine,

aspartic acid, isoleucine, serine, threonine and the amount (mol %) of these amino acids are 15.8, 11.3, 9.3, 9.2 and 7.1, respectively²¹.

Seven polysulphides have been isolated from *Parkia speciosa* seed. The structures of four of these have been established as 1,2,4-trithiolane, 1,2,4,6-tetrathiopane, 1,2,3,5,6-pentathiopane (lenthionine) and 1,2,4,5,7,8-hexathionane, 1,2,4,5,7 and 1,2,4,6,7-pentathiocane, 1,2,4,5-tetrathiopane. These compounds were extracted with chloroform and separated by chromatography. The structures were identified by nuclear magnetic resonance technique (NMR). Only two compounds have anti-microbial and anti-fungal activity (1,2,4,5,7,8-hexathionane and 1,2,4-trithiolane)⁸.

Thiazolidine-4-carboxylic acid (thioprolin) is present in *Parkia speciosa* seeds and other edible leguminous beans which popularly eaten in the southern part of Thailand. Thioprolin is an effective nitrite-trapping agent in the human body, thereby inhibiting the endogenous formation of carcinogenic *N*-nitroso compounds. The uncooked *Parkia speciosa* seeds contained substantial amount of formaldehyde and thiol compounds and the amounts decreased after boiling²².

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