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Pattern of 'Concanavalin A' Synthesis during Development of Jack Bean (*Canavalia ensiformis*) Pods

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[Abstract]

Jack bean [*Canavalia ensiformis* (L.)], belonging to the Leguminosae family has been frequently used in edible and medicinal plants in Asian countries. Jack beans are high in protein which is approximately 30%. Concanavalin A (Con A) is a major protein of Jack bean and belongs to the family of legume lectins. It has inhibitory effect on hepatocellular carcinoma by inducing autophagy. However, Con A negatively affects nutrient utilization by other mechanisms. It binds to the glycoproteins and glycolipids of the digestive tract mucosa, inhibits the activity of the enzymes of the brush border of the enterocytes. In order to use Jack bean young seedpods, they are restricted to 'young pods (soft, pre-swelling)' according to the 'Food Code' (Ministry of Food and Drug Safety). Therefore, in this study, we investigated the quantitative change of Con A across developmental stages of Jack bean pods. Biological samples consisted of Jack bean pods and seeds in 7 stages of development. The expression pattern of Con A mRNA was monitored by quantitative reverse transcription PCR (RT-qPCR). Expression of Con A proteins was analyzed by western blotting. The expression of Con A mRNA and protein in the seeds tended to increase gradually as the seeds expanded. However, in pods, they were much less than in seeds. As the expression of Con A mRNA and protein increases as the pods thicken, it is predicted that Con A synthesis increases when the thickness growth of the pod begins after the length growth of the pod is completed. Since the expression of Con A in the pods and seeds is very low when the pods are about 2 cm, therefore 2 cm pods seem appropriate when using 'young pods'. It is also necessary to study other proteins in Jack bean, such as Urease and Canavalin. These studies will serve as the basis for processing Jack bean.

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