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# Influence of Cultivar and Plant Age on Cyanide and Protein Contents in Thai Cassava (*Manihot esculenta* Crantz) Leaves

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**Abstract**

Cassava leave is one of the major global wastes from the agricultural sector. It has a significant content of protein, vitamin C, carotenoids and chlorophyll. Recently, the utilisation of cassava leave in Thailand has been rare due to its toxictity from cyanide. In this study, the influence of cultivar and plant age on cyanide and protein contents in cassava leaves was studied. Four cultivars were selected. Cultivar Hanatee and Rayong 2 were representing a sweet type, while cv. Rayong 5 and Kasetsart 50 were representing a bitter type. The leaves were collected from cassava plants at six and twelve months after planting. They were harvested from the branch at seventh to ninth row from the top of the plant. Cyanide content and crude protein in the leaves were investigated. The results showed that in general cultivars affected the cyanide content in the leaves for both plant ages. The cultivar Kasetsart 50 had the highest cyanide content in the leave with a concentration of $2330.18 \pm 152.08$ and $2209.92 \pm 162.30$ ppm HCN equivalent (dry basis) for six and twelve months plant ages, respectively. When the plant was matured for harvesting its root (twelve months), cultivars did not show significantly impact on protein content in the leaves. The protein content in the leaves from both sweet and bitter types at crop harvesting period were in the range of $23.17 \pm 1.37$ to $25.61 \pm 1.96$ g/100 g dry basis. In contrast, the protein contents in the leaves from six months old plant were significantly different depending on cultivars. At this plant age, the bitter type showed higher protein contents compared to those sweet varieties. The protein contents were $34.82 \pm 1.54$ and $31.21 \pm 0.98$ g/100 g dry basis for cv. Rayong 5 and Kasetsart 50, respectively. The impact of cultivar and plant age on other nutrients such as vitamin C and carotenoids in the leaves is under investigated. The outcome will not only enhance the farm waste management but also introducing cassava leaves as a substitution source of protein in human nutrition for the cassava growing countries which are mostly under developed countries.

**Keywords:** Cassava, cyanide, farm waste, nutrient, protein

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