

Oxalic acid content of commonly consumed green leafy vegetables of Sri Lanka

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Oxalic acid is a metabolic end product, which is naturally present in plant materials. In increased quantity it is toxic to human beings due to the promotion of kidney stone formation, inhibition of mineral absorption and irritation and damage to tissues of digestive tract and kidney tubule. Thus the objective of the present study was to determine the oxalic acid content of some green leafy vegetables (mukunuwenna, katurumurunga, gotukola, manioc, kankun, kohila, niviti and sarana) commonly consumed in Sri Lanka.

Plant materials were collected from the dry zone and the wet zone. The edible portion consisting of both tender stems and leaves was homogenized, extracted and titrated with potassium permanganate solution. According to the results from this study, the plants on their wet weight can be categorized in to a) leaves with high oxalic acid content (mukunuwenna - 701 ± 236 mg/100 g, sarana - 825 ± 223 mg/100 g and niviti - 471 ± 89 mg/100 g), b) leaves with low oxalic acid content (passion - 50 ± 10 mg/100 g, manioc - 72 ± 5 mg/100 g, katurumurunga - 54 ± 10 mg/100 g) and c) leaves with undetectable amount of oxalic acid (gotukola).

There was no significant variation in oxalic acid content ($p = 0.05$ and $p = 0.1$) of the manioc and mukunuwenna plants obtained from dry zone and wet zone. This indicates that the oxalic acid content is not affected by the climate in these two plants significantly. Similarly, the variation in oxalic acid content in different varieties of the same species, manioc (red stemmed leaf and white stemmed leaf - $p = 0.74$) and mukunuwenna (white stemmed and red stemmed varieties - $p = 0.75$) was not significant.

Frequent consumption of high oxalic acid containing green leafy vegetables such as nivithi, sarana and mukunuwenna may not be advisable for people with kidney stones or with a family history of kidney stone diseases.

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