

DISTRIBUTION OF OXALATE IN DIFFERENT TISSUES OF STAR FRUIT

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Star fruit (*Averrhoa carambola*) is a popular fruit with a high concentration of oxalate. Therefore, prolonged and regular consumption of star fruits can lead to urinary calcium oxalate crystal formation, nephrolithiasis and chronic kidney diseases. Data are scarce on the distribution of oxalate in star fruit tissues. The present study determined the oxalate concentration in different parts of the fruits of the small sour wild and large sweet hybrid cultivars. The oxalate concentrations in the flesh, peel and ridges of mature unripe and ripe fruits were determined by titrating with KMnO₄. The results show that the mean total oxalate concentration (mg/100 g) in the flesh, peel and ridges of the small sour ripe fruits were 40.2 ± 5.2, 73.0 ± 5.1 and 125.6 ± 6.1, respectively, and that of the unripe fruit of the same cultivar were 29.9 ± 1.1, 70.5 ± 18.4 and 110.9 ± 19.9, respectively. In large sweet ripe fruits, the mean total oxalate concentration in flesh, peel and ridges were 31.7 ± 11.7, 60.2 ± 16.9 and 107.9 ± 28.7, respectively, and that of the unripe fruit of the same cultivar were 28.8 ± 7.3, 56.4 ± 18.4 and 110.6 ± 28.2, respectively. The results revealed that the mean total oxalate concentration in ridges on all four treatments was significantly ($p < 0.05$) higher than the other parts of the fruit, while the lowest content was observed in the flesh. Comparatively, the concentration of oxalate was higher in the small sour fruits than the large sweet fruits. The unripe fruits of both cultivars contain a relatively lower content of oxalate than ripe fruits. The results suggest that consuming the large sweet star fruit is safer than consuming small sour fruits, and removing the peel with ridges before consuming star fruits is recommended.

Keywords: *Averrhoa carambola*, Large sweet fruits, Oxalate content, Small sour fruits, Star fruits