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## Partitioning of Non-Structural Carbohydrates in the Fruiting Cape Gooseberry (*Physalis peruviana* L.) Plant

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### Abstract

Cape gooseberry (*Physalis peruviana* L., Solanaceae) originates in the Andean zones and as a semi-woody perennial plant grows half-wild between 1,500 and 3,000 m altitude from Colombia to Chile. Although in Colombia it has become the second important export fruit, scarce information exists about the carbohydrate partitioning in cape gooseberry. However, carbohydrate partitioning plays a major role in plant productivity and later might play a signalling function during plant pathogenesis. Seed propagated ecotype 'Colombia' was kept in a greenhouse (22°C, 75 % RH) in 2.5 l black plastic containers in washed quartz sand and triple irrigated daily 300–500 ml per pot with a Wuxal solution (8:8:6 (N:P:K)), while Ca and Mg were taken from tap water. Plants were pruned up to one main vegetative stem with two generative leaders leaving the lateral generative shoots with the first node. Dry matter (DM) partitioning during initial plant growth showed the highest accumulation rate in roots during first 20 days, whereas at a later stage of development shoot DM gain was higher and leaf DM gain lower than in the roots. Sixty days after transplanting, plant parts were analysed for glucose, fructose, sucrose, and starch. As in other perennial plants, roots were the greatest carbohydrate pool for starch. Root sucrose content was lower than in the vegetative stem and the lower part of the reproductive axes. At 5–15 cm of the vegetative stem base 6.4 % starch, 1.4 % monosaccharides and 5.3 % sucrose were found, indicating that this lower organ is also important for starch accumulation and, especially, for sucrose transport. In the two reproductive axes, starch contents were much higher in the base part than in the apical one; the same relation was found in leaves. Monosaccharid content was highest in the apical stem position with 8.2 %. In contrast, apical positioned 10 days old fruits had maximum starch levels (11.6 %), possibly, of primary starch from own photosynthesis, whereas mature basal fruits (60 days) accumulated principally sucrose (27.7 %) and monosaccharides (21.2 %). Whereas in vegetative plant parts glucose contents were 51–69 % higher than those of fructose, in fruits their contents were nearly the same ones.

**Keywords:** Carbohydrate partitioning, *Physalis peruviana*