Kinetics of Phytochemicals and Antioxidant Activity during Thermal Treatment of Cape Gooseberry (Physalis peruviana L)

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Abstract : Cape gooseberry, the fruit of the plant Physalis peruviana L. has gained interest in research given its contents of promising health-promoting compounds like contents. The presence of carotenoids, ascorbic acid, minerals, polyphenols, vitamins and antioxidants. This project aims to study thermal stability of β-carotene, ascorbic acid, catechin and epicatechin and antioxidant activity in the matrix of the Cape Gooseberry. Fruits were obtained from a Colombian field in Cundinamarca. Ripeness stage was 4 (According to NTC 4580, corresponding to mature stage) at the moment of the experiment. The fruits have been subjected to temperatures of 40, 60, 80, 100 and 120°C for several times. β-Carotene, ascorbic acid, catechin and epicatechin content were assessed with HPLC and antioxidant activity with the DPPH method. β-Carotene was stable upon 100°C, and showed some degradation at 120°C. The same behavior was observed for epicatechin. Catechin increased during treatment at 40°C, at 60°C it remained stable and it showed degradation at 80°C, 100°C and 120°C that could be described by a second order kinetic model. Ascorbic acid was the most heat-sensitive of the analyzed compounds. It showed degradation at all studied temperatures, and could be described by a first order model. The activation energy for ascorbic acid degradation in cape gooseberry was 46.0 kJ/mol and its degradation rate coefficient at 100 °C was 6.53 x 10-3 s-1. The antioxidant activity declined for all studied temperatures. Results from this study showed that cape gooseberry is an important source of different health-promoting compounds and some of them are stable to heat. That makes this fruit a suitable raw material for processed products such as jam, juices and dehydrated fruit, giving the consumer a good intake of these compounds.

Keywords : goldenberry, health-promoting compounds, phytochemical, processing, heat treatment
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