

### Anthocyanin composition and related pigments in strawberry

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The anthocyanin composition of the strawberry has been object of various studies, but it is still not fully characterized. It is well known the presence of pelargonidin 3-glucoside (Pg 3-gluc) as major anthocyanin, usually accompanied of smaller proportions of pelargonidin 3-rutinoside (Pg 3-rut) and cyanidin 3-glucoside (Cy 3-gluc). In different strawberry cultivars, other very minor pigments have also been reported, such as Pg 3-arabinoside and some acylated derivatives of Pg and Cy glucosides with acetic, succinic or malonic acids. In a previous study of our group (1), twelve new minor anthocyanins were described in strawberry, cv Camarosa. In the present work, a more detailed study of the anthocyanin composition has been carried out using strawberries from five different cultivars. The use of optimized HPLC conditions coupled to diode array and mass detection allowed us to detect up to thirty-one different pigments and conclude about the identity of most of them. Pg was the most usual aglycone, although some Cy derivatives were relevant and trace amounts of anthocyanins containing delphinidin and malvidin aglycones were also detected. Different glycosilation patterns were found among the pigments, including mono- and disaccharides of hexoses and pentoses, as well as acylation with malic, malonic or acetic acid. The most novel aspect was the detection of a new class of pigments containing C-C linked anthocyanin (Pg) and flavanol (catechin and afzelechin) residues. In our knowledge, that type of compounds is described in plants for the first time, up to now their formation was only speculated during processing and storage in plant-derived foodstuffs and beverages. Qualitative differences were found in the pigment profiles of the distinct strawberry cultivars, although they were not sufficient to conclude about a possible relationship between cultivar and pigment composition. Total anthocyanin content in the samples analysed ranged between 200 and 600 mg.kg<sup>-1</sup>, with Pg 3-gluc constituting 77-90% of the anthocyanin present followed by Pg 3-rut (6-11%) and Cy 3-gluc (4-10%). A notable variability was found among the anthocyanin concentrations in samples of a same variety and harvest, indicating that they were strongly influenced by the degree of maturity, edafo-climatic factors and post-harvest storage.

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(1) Lopes-da-Silva, F.; de Pascual-Teresa, S.; Rivas-Gonzalo, J.C.; Santos-Buelga, C. (2002). *Eur Food Res Technol*, 214: 248-253.