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Production of bioactive pigments in cell lines of quinoa (*Chenopodium quinoa*)

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Betalains are water-soluble, nitrogen containing pigments present in most plants of the order Caryophyllales. Betalains are classified into two structural groups: betacyanins (violet) and betaxanthins (yellow). Both groups share betalamic acid as the structural and chromophoric unit. It is condensed with amines and amino acids in betaxanthins and with *cyclo*-DOPA in betacyanins. Betalains are bioactive molecules with high antioxidant and free radical scavenging activities and a strong chemopreventive potential. The present research was focused on the establishment of callus cell lines derived from the plant quinoa (*Chenopodium quinoa*). Quinoa belongs to the family Amaranthaceae and thus to the betalain producing order Caryophyllales. Cell lines were developed on semisolid medium and the betalamic pigments synthetized by different lines have been identified by HPLC-DAD-MS/MS, as well as the pigment content present in the seedlings used as explants. Violet callus cell lines of *Chenopodium quinoa* were developed from hypocotyls of differently colored Peruvian quinoa grains varieties (Figure C), recently described as source of betalains. In callus, the major pigment identified was betanin, while in seedlings one of the major pigments detected was the non-glycosylated and hydroxylated precursor of the violet compounds, betanidin. For the first time betalain producing callus lines derived from quinoa were established. This offers an opportunity to develop cell suspension cultures to be used as bio-factories in the production of bioactive pigments betalains. The controlled production of theses pigments to be used as functional natural colorants may be of interest for the food, pharmaceutical and cosmetic industries.

Biography

Josefa Escribano-Cebrián was trained as a Biochemist at the Department of Biochemistry and Molecular Biology of the University of Murcia (Spain). She got her PhD in 1986 and since then she has been working in Plant Biochemistry. She has publications in national and international journals. Currently, her research project combines different approaches and multiple techniques to study the functional capacity of a family of bioactive plant compounds-the betalains

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