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Semi-synthesis of lysine-betaxanthin and its fluorescent properties

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Betalains are nitrogen-containing natural pigments that provide bright coloration to fruits, flowers, and roots of plants of the Caryophyllales order and present autofluorescence after excitation with blue light. They are divided into two groups: violet betacyanins, with absorbance spectra centered at wavelengths around λm = 536 nm, and yellow betaxanthins, with absorbance spectra centered at wavelengths around λm = 480 nm. Both groups share betalamic acid as their structural and chromophoric unit, which is condensed with *cyclo*-DOPA in the betacyanins and with amines and amino acids in the betaxanthins In this work, the semi-synthesis of lysine-betaxanthin from betanin, purified from red beet juice concentrate has been carried out. Basic hydrolysis of betanin released betalamic acid, whose aldehyde group was condensed with the amine group of lysine. Immediately after synthesis, lysine-betaxanthin was partially purified by solid phase extraction with a C-18 column. The pigment was characterized by absorbance spectroscopy and HPLC-DAD analysis. Electrospray ionization mass spectrometry analysis (HPLC-ESI-MS-MS) was applied to elucidate the pigment nature. Since lysine has two amine groups, one α and one ε, the *in-vitro* reaction of the amino acid with betalamic resulted in the formation of two adducts. In this work, the native fluorescence of lysine-betaxanthin has also been characterized, by using an aqueous solution of the pigment for registration of the fluorescence spectrum.

Biography

Cabanes Cos J, trained as a Biochemist at the Department of Biochemistry and Molecular Biology A of the University of Murcia (Spain). She got her PhD in 1986 and since then she has been working in Plant Biochemistry and Biotechnology. She has been teaching for more than 30 years Biology and Biotechnology both in University of Murcia. She also teaches Master's of Molecular Biology and Biotechnology of the University of Murcia. 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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