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Bioactive betalains produced *in vitro* in cell lines of *Celosia argentea*

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It is estimated that 25% of medicines, cosmetics, aromatic essences, flavorings and colorings used in developed countries come from secondary metabolites. This is the case of betalains, plant pigments of hydrophilic nature with demonstrated chemopreventive potential in cancer cell lines and animal models, which also have antioxidant, anti-inflammatory and neuroprotective activity. Considered as nutraceuticals at very low concentrations it is also feasible their use as bioactive natural pigments in the food industry. *Celosia argentea* var. *plumosa* betalains were biosynthesized *in vitro* in this work. For the first time it is described the establishment of *in vitro* cell lines, generating callus and suspension of this plant of the Amaranthaceae from hypocotyls by using Murashige and Skoog medium supplemented with 6.66 µM BAP and 2,4-D 6.79 µM. Two stable and differentially colored callus cell lines, yellow and red were obtained. Aqueous extracts of these calli were encapsulated with maltodextrins achieving stable pink and yellow powders. Derived suspension cultures showed high contents of betalains with the compounds being accumulated and excreted to the medium with a maximum production after 8 days of culture. In addition, precursor molecules as betalamic acid and dopamine were produced with dopamine levels as high as 42.08 mg/g dry weight. The production of bioactive betalains with dopamine and betalamic acid precursors show the capacity of *C. argentea* cell cultures to be a stable source for valuable phytochemicals with application as functional natural colorant in the food, pharmaceutical and cosmetics industries.

Biography

Garcia-Carmona Francisco is the Head of the group Enzyme Biochemistry and Biotechnology at the University of Murcia, Spain. His main interests are enzymology of oxidases, production of metabolites and drugs and biotechnological applications of enzymes. He has coordinated many research projects and published more than 250 papers in reputed journals.

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