O1. EVALUATION OF THE ANTICANCER POTENTIAL OF GOLDENBERRY CALYX UNDER A FOODOMICS PERSPECTIVE

Gerardo Alvarez-Rivera[1]*, Diego Ballesteros-Vivas[1,2], Alberto Valdés[3], Fabián Parada-Alfonso[2], Elena Ibánez[1], Alejandro Cifuentes[1]

[1] *Laboratory of Foodomics, Institute of Food Science Research, CIAL, CSIC, Madrid, Spain.*

[2] *High Pressure Laboratory, Faculty of Science, Universidad Nacional de Colombia, Bogotá.*

[3] *Department of Analytical Chemistry, University of Alcalá, Madrid, Spain.*

* gerardo.alvarez@csic.es

The prevention of human diseases by means of the proper diet control and the intake of functional food or nutraceutical products is becoming an emerging trend in medicine, food and bioscience fields. In recent years, Foodomics has become a powerful multi-omic platform to investigate the potential health benefits of some dietary agents of interest that can reverse, suppress or prevent cancer progression [1]. In this regard, the calyx of goldenberry fruit is an interesting agri-food waste which represents a powerful source of bioactive compounds of great interest from the pharmacological point of view [2,3].

In the framework of a sustainable strategy for goldenberry calyx valorisation, an integrated Foodomics approach is proposed in this work to investigate the bioactive potential of this unexplored food by-product. Thus, a pressurized-liquid extraction (PLE) procedure was optimized to obtain an enriched extract in high-added value compounds, followed by a comprehensive phytochemical characterization by LC and GC coupled to q-TOF-MS(/MS). A broad variety of interesting phytoconstituents such as withanolides (C_{28}-isoprenoids), phenolic acids, flavonoids, sucrose esters, terpenoids, phytosterols, and phytol derivatives (e.g., vitamin E) were identified in the enriched PLE extracts, whose bioactive potential was tested against HT-29 colon cancer cells. After 48 h of treatment, the viability of HT-29 cells was notably reduced without affecting normal human colon fibroblast cells. Metabolomics and transcriptomics data integration revealed alteration of cellular redox homeostasis, inactivation of aminoacyl tRNA charging pathway, dysfunction on carnitine shuttle and beta-oxidation of fatty acids, and pyrimidine ribonucleotide interconversion impairment. The results reported herein represent a valuable contribution to the sustainable valorization of goldenberry calyx and to better understand the molecular mechanisms underlying its bioactivity against human colon cancer, demonstrating the huge potential of Foodomics to carry out this type of studies.

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