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Phenolic composition of two tomato varieties and an industrial tomato byproduct: Free, conjugated and bound phenolics and antioxidant activity

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The aim of this study was to isolate, identify and quantify soluble free phenolics (SFP), conjugated acid-hydrolysable phenolics (AHP) and alkaline-hydrolysable phenolics (AKHP), and bound phenolics (BP) fractions from two tomato varieties (saladette and grape) and an industrial tomato by-product, as well as, to determine their antioxidant capacity. Phenolic composition was determined using Folin-Ciocalteu method and HPLC-DAD. AHP were predominant in grape and saladette tomato extracts (91.47 ± 17.28 mg gallic acid equivalents (GAE) per g dry extract (DE) and 57.41 ± 8.80 mg GAE per g DE, respectively), while BP form was predominant in tomato by-product (51.30 ± 10.91 GAE per g DE). AHP extract of grape tomato presented the highest antioxidant capacity by DPPH assay (252.35 ± 42.55 μ mol trolox equivalent (TE) per g DE). In the case of ORAC assay, AHP fractions from both grape (1005.19 ± 138.52 μ mol TE per g DE) and saladette tomatoes (804.16 ± 131.45 μ mol TE per g DE), and BP fraction from by-product (852.40 ± 71.46 μ mol TE per g DE) showed the highest ORAC values. Caffeic acid was the most abundant phenolic acid and it was found mainly in its conjugated forms. Naringenin was the most abundant flavonoid and it was mainly detected in bound form. Our analysis allowed a better characterization of phenolic compounds in whole tomato and by-product, remarking the importance of the fractionation. The valorization of the industrial tomato by-product, through the use of its different fractions of phenolic antioxidant compounds, could generate additional income to the tomato industry and reduce the waste disposal problem.

Biography

Xiomara Patricia Perea-Domínguez has completed her Master's degree in Science from National Polytechnic Institute in Mexico. She is a PhD student at the same institution and, has worked in the development of research projects in food biotechnology and environmental toxicology.

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