

O 27A - Valorisation of vine-shoots: ultrasound-assisted extraction of proanthocyanidins

C. Da Porto, A. Natolino, M. Scalet

Department of Agricultural, Food, Environmental and Animal Sciences, University of Udine, via Sondrio 2/A, 33100 Udine, Italy

Abstract

Purpose: Vine-shoots are agricultural wastes of vineyards. About 1.4-2.0 tons of shoots can be obtained per hectare of vine per year. The world area under vines is about 7.5 million ha, and then an estimated total of 10.5-15 million tons of vine-shoots are produced each year. The studies conducted on the phenolic composition of vine-shoots generally focused on the stilbenes because of the interest in their health-promoting. However, to the best of our knowledge, there has been no work, thus far, on the proanthocyanidins (PAs) from vine-shoots. Proanthocyanidins exist as oligomers (OPCs), containing two to ten or more 'catechin' units, and polymers (PPCs). This study aims at performing optimisation of ultrasound-assisted extraction (UAE) of OPCs and PPCs from vine-shoots using response surface methodology

Experimental description: The optimization was based on a Box-Behnken experimental design, applied both to OPCs and PPCs. Independent variables were operating ultrasound power (100, 150, and 200 W), liquid-to-solid ratio (50, 75, and 100 mL g⁻¹) and extraction time (10, 20, 30 min). Antioxidant activity of OPCs and PPCs was studied too.

Results: The yield of the OPCs and PPCs was evaluated under the optimal UAE conditions found. The predicted values for OPCs and PPCs were compared with the experimental values and the validity of the models tested.

Conclusions: The results obtained by RSM pointed the most effective factors in the UAE of OPCs and PPCs from vine-shoots. Overall, UAE of OPCs and PPCs from abundant agricultural by-products such as vine-shoots and by using food grade solvent could have a strong potential of industrial development as an efficient and environment-friendly process for the preparation of extracts rich in bioactive compounds with different potential applications. OPCs can be applied as plant-based health-beneficial components in the human diet, while PPCs as natural for the nutraceutical, cosmetic and pharmaceutical industries

Key Words: vine-shoots, ultrasound-assisted extraction, Box-Behnken, oligomeric and polymeric proanthocyanidins

Correspondence: Carla Da Porto - Department of Agricultural, Food, Environmental and Animal Sciences, University of Udine, via Sondrio 2/A, 33100 Udine, Italy- email: carla.daporto@uniud.it