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Phytochemicals in food industry by-products: The case of coffee silverskin

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Recovery of waste and added value by-products in the food industry is mandatory in a society that aims environmental, social and economic sustainability. It promotes waste reduction and gains instead of expenses.

In the present study, we used coffee silverskin, a by-product (with no added value) of coffee roast industry, as a possible source of phytochemicals with antioxidant activity. Silverskin from three commercial coffee batches (a pure robusta and two blends with arabica and robusta coffees) were provided by a local coffee torrefaction industry.

Extracts were prepared using ethanol:water (1:1) at 40°C, for 60 minutes. Flavonoids [1], tannins [2] and total phenolic contents [3], as well as antioxidant activity, were evaluated by spectrophotometric methods. Antioxidant activity was determined by using both the ferric reducing antioxidant power (FRAP) [4], and 1, 1-diphenyl-2-picrylhydrazyl free radical (DPPH•) assays [1].

No significant differences were found ($p < 0.05$) between silverskin extracts of coffee blends in what concerns to flavonoids (~116 mg ECE/L), tannins (~0.4 mg TAE/L), and total phenolics (~370 mg GAE/L). The silverskin extract from 100% robusta coffee showed significantly lower ($p < 0.05$) contents. Concordantly, higher antioxidant activities ($p < 0.05$) were found for silverskin extracts from blends.

These preliminary results suggest that it could be possible to chemically distinguish silverskin from different coffee species. Furthermore, this by-product appears as an antioxidant-rich product that could be used for incorporation, for instance, in dietetic supplements or foodstuff fortification.

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