

Recovery and characterization of functional ingredients and bioactive compounds from *Theobroma cocoa* bean shells: an overview among chemistry, technology and nutrition

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Cocoa and chocolate (*Theobroma cacao* L.) have been found to be rich plant-derived sources of antioxidant polyphenols (particularly flavonoids) with different beneficial properties. As well known, these favorable physiological effects include antioxidant activity, vasodilation and blood pressure reduction, inhibition of platelet activity, and decreased inflammation. Cocoa consumption is so correlated with reduced health risks of cardiovascular diseases, hypertension, atherosclerosis, and cancer; all the health-promoting effects of cocoa are mediated by phytochemicals.

Cocoa bean processing, particularly roasting process, leads to the production of wastes (cocoa bean shells, CBSs, often defined also as “husks”) more properly currently considered as “by-products”, rich in fibres and other bioactive polyphenols. According to the principles of green chemistry and circular economy, the recovery of bioactive compounds from by-products and wastes is a useful approach to formulate new “functional ingredients”, a priority in modern food technology.

This lecture will explore all the findings related to the identification, extraction and characterization of bioactive compounds from CBSs, highlighting the technical approaches functional to their isolation, extraction and formulation.

An overview about the main outcomes obtained by our research group (and about the technical processing used) will focus on carbohydrates and polyphenols recovered from this interesting biomass.