

ENZYMATIC RELEASE OF FERULIC ACID FROM VINE TRIMMING SHOOTS AND CORNCOB

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2.1 Natural Resources Sustainability

Ferulic acid is the most abundant hydroxycinnamic acid in cell wall polysaccharides (Benoit et al., 2008). This acid can perform several functions including antioxidant, antimicrobial or anti-inflammatory and it has reported to play an important role in prevention or treatment of some human diseases particularly atherosclerosis, cancer or diabetes (Srinivasan et al., 2007; Zhao & Moghadasian, 2008). Ferulic acid also has a range of applications in the cosmetic industry where it is used for its anti-aging effect and in the food industry is employed as an additive antioxidant or transformed into other valuable molecules such as flavour precursors of aromatic constituents used in some foods (Ou & Kwok, 2004).

Feruloyl esterases (EC 3.1.1.73), a class of enzymes that are involved in the hydrolysis of the ester linkages of ferulic and diferulic acids (Koseki et al., 2009), release ferulic acid and other cinnamic acids from plant cell wall polysaccharides (Benoit et al., 2008). Vine trimming shoot and corncob are residues from agroindustrial sector whose lignocellulosic nature made them liable to be valorized as a source of ferulic acid. Consequently, in the present work, these materials were the substrates for enzymatic hydrolysis to produce ferulic acid solutions able to be used as a food additives precursor media and made from an environmentally friendly process.

More in detail, *Aspergillus terreus* CECT 2808 is a fungi strain which was selected in a previous research to obtain feruloyl esterases from vine trimming shoot, corncob or their mixture as carbon sources. The feruloyl esterase activity of enzymatic extracts generated from each material has been evaluated in the same substrate where this enzyme was produced and in the other two. Ultraflo L® was employed as a control. As a result, maximum ferulic acid release by fungi extract were 211 ± 16 mg/L from corncob and 21 ± 0.01 mg/L from vine trimming shoot, so corncob was the material with the major quantity of this hydroxycinnamic acid release after 33 hours of hydrolysis. However, in terms of percentage of ferulic acid release from the total possible to release from the material, vine trimming shoot compared with corncob (16.6 ± 4.3 %) has been the best one with a remarkable yield of extraction of 74.0 ± 0.1 %.

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