

**OP&CII\_6****INFLUENCE OF A COFFEE SILVERSKIN EXTRACT ON  
GLUCOSE INTESTINAL TRANSPORTERS: AN APPARENT  
SYNERGISM BETWEEN CAFFEINE AND 5-O-  
CAFFEYLQUINIC ACID**

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Coffee silverskin is the main by-product of coffee roasting. In a previous study [1], a silverskin extract, prepared using a green method of extraction, was able to concentration-dependently influence glucose (3H-DG) uptake by the human intestinal epithelial (Caco-2) cell line. At the highest concentration tested (1 mg/ml extract; 24-h treatment), it caused a significant reduction (~17%) of 3H-DG uptake.

In this work, the influence of this extract (1 mg/ml extract; 24-h treatment) on glucose intestinal transporters (GLUT2 and SGLT1) expression levels were assessed by RT-qPCR. In addition, the effects of caffeine and 5-O-caffeoylquinic (found to be major components of the extract, by chemical characterization by RP-HPLC-DAD), alone and combined, on 3H-DG uptake glucose uptake were also studied.

The extract significantly reduced the mRNA expression levels of GLUT2 (~71%,  $p < 0.05$ ) and tended to reduce the mRNA expression of SGLT1 (~12%,  $p > 0.05$ ). Moreover, neither caffeine nor 5-O-caffeoylquinic acid were able to influence 3H-DG uptake when tested individually, but significant inhibitions were found (~16%,  $p < 0.05$ ) when combined. This effect was quite similar to that observed for the extract, suggesting a major role of this synergistic activity between both compounds in the silverskin extract.



Overall, these results indicate that silverskin might be a useful ingredient in the development of a functional product aimed at preventing metabolic disorders, such as type 2 diabetes, due to their richness in bioactive compounds that possess the ability to reduce intestinal glucose uptake.

**Keywords:** Coffee silverskin, Glucose uptake, Caffeine, 5-O-caffeoylquinic acid, By-products valorization and Health promotion

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