

Correlating Chemical Compounds with Antioxidant Capacity in Torrefacto Roast Coffees

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SUMMARY

Antioxidant capacity of coffee is dramatically determined by roasting process. Torrefacto coffee is characterized by the addition of sugar at the end of the roasting process. The aims of the present work are to characterize commercial torrefacto roasted coffees and to try to elucidate the potential antioxidant capacity of coffee chemical compounds by means of multivariate statistical techniques (Correlation and Principal Components Analyses). Only high significant ($p < 0.01$) and excellent ($r > 0.75$) correlations between both antioxidant capacity parameters (DPPH and potential redox) and melanoidins (0.876 and -0.836, respectively) and trigonelline (0.889 and -0.797) have been found. Moreover, 5-CQA (0.633 and -0.573), hexanal (0.471 and -0.875) and caffeine (0.414 and -0.687) showed significant ($p < 0.05$) but moderate correlation. Furthermore, Principal Component Analysis allowed separation of torrefacto roast blends by PC1 (58.8%) characterised by antioxidant capacity and their related coffee chemical compounds. Antioxidant capacity of coffee could be mainly explained by the Maillard reaction and caramelization products enhanced by the addition of sugar in roasting process. However, there are other compounds such as trigonelline that may contribute to the antioxidant capacity of coffee.