

Identification of Carotenoids and Carotenoid Degradation Products in Coffee

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SUMMARY

Carotenoid compounds as well as degradation products from carotenoids have been identified in green coffee origins. The xanthophylls lutein and zeaxanthin were identified by means of HPLC with detection in the visible wavelength region following extraction with acetone. In addition, glycosidically bound ionols were identified as carotenoid degradation products known to be formed by the oxidative degradation of lutein and zeaxanthin. These glycosides were analyzed by adsorption on XAD-1180 resin followed by enzymatic hydrolysis of the eluted extract with β -glucosidase and GC-MS analysis of the released aglycones.

To investigate the impact of carotenoids on aroma formation a model roasting system was used. For this purpose, "depleted" green coffee was enriched with β -carotene, a structurally similar carotenoid, since the contents of the naturally occurring lutein and zeaxanthin are small. β -Carotene was degraded under coffee roasting conditions to yield β -ionone, its known major degradation product. Furthermore, the importance of 3-oxo- α -ionol as an aroma precursor was also investigated in the model system. 3-Oxo- α -ionol is a precursor for isomeric megastigmatrienones which were also identified in green coffee after aroma isolation by simultaneous-distillation-extraction (SDE). It is suggested that the content of megastigmatrienones is influenced by the sample preparation procedure.