探討不同烘焙條件對咖啡中香氣化合物、咖啡因及綠原酸含量之影響

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11/22/2023

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一、前言
二、探討不同烘焙程度的咖啡豆對於土耳其咖啡香氣化合物之影響
三、以 UHPLC 分析咖啡在不同烘焙階段其呋喃含量
四、以 HPLC-DAD 分析不同烘焙程度對咖啡中咖啡因及綠原酸含量之影響
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摘要

咖啡因其宜人的香氣及味道而在全球成為廣泛消費的飲料之一，適當的烘培條件可使咖啡產生理想的香氣，而烘焙程度也會影響呋喃、綠原酸及咖啡因之含量。本研究使用氣相層析質譜嗅聞法 (Gas chromatography-mass spectrometry-olfactometry, GC-MS-O) 研究中度烘焙 (Medium roasted coffee, MRC) 及深度烘焙土耳其咖啡 (Dark roasted coffee, DRC) 的關鍵氣味；另外以 UHPLC 測定阿拉比卡咖啡豆 (*Coffea arabica*) 和羅布斯塔咖啡豆 (*Coffea canephora*) 在各烘焙階段呋喃之含量，並將其作為時間溫度指示劑 (Time-temperature indicators, TTI)，作為烘焙溫度測量之替代方案，並與市售樣品比較之；此外也使用 HPLC-DAD 測定並比較不同產地與烘焙程度咖啡豆之綠原酸及咖啡因含量，並進行抗氧化性之評估。結果顯示，在 MRC 和 DRC 分別檢測到 26 及 28 種關鍵氣味物質，風味稀釋 (Flavour dilution, FD) 因子在 4 至 2048 之間，最高者為 2-ethyl-3,5-dimethylpyrazine (MRC) 和 2-ethyl-3-methylpyrazine (DRC)。此外，DRC 中 FD 值較大的氣味化合物較 MRC 多，根據感官分析，MRC 沖泡咖啡在感官描述上得分較高。而烘焙試驗中六種呋喃只有 5-Methylfurfural (MF) 和 2-Furoic acid (FA) 含量呈穩定上升，適合做為 TTI。此外，咖啡因和綠原酸的含量分別與烘焙程度呈正相關及負相關，中度烘焙者咖啡因含量最高 (203.63 mg/L)，綠原酸則在生咖啡豆中檢測出最高含量 (543.23 mg/L)。且只有綠原酸 (而非總酚類) 與咖啡的抗氧化活性有關。綜上述研究，經 155℃ 烘焙之咖啡具有較佳的風味及抗氧化性。

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