



Ultra High-Speed Analysis of Curcumin in Turmeric by UHPLC

Introduction

Curcumin is the principal curucuminoid of the popular Indian spice turmeric, which is a member of the polyphenols. It is well known that it has physiological effects such as anti-ulcer, antioxidant and anti-inflammatory activities. Turmeric curucuminoids contain curcumin as keto and enol types.

In this report, curcuminoids in turmeric were analyzed using Ultra High-Performance Liquid Chromatography (UHPLC) with PDA detector, which enables ultra high-speed data aquisition of 100 spectra/sec..

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Keyword : UHPLC, Turmeric, Curcumin, 1.8 μ m, C18 Column, PDA Detector, Bis-demethoxycurcumin, Demethoxycurcumin, Curcumin Fluorescence detector



JASCO X-LC system

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Application Library: <http://www.jascoinc.com/applications>

Experimental Equipment:

Eluent pump:	X-LC 3185PU x 2
Degasser:	X-LC 3080DG
Mixer:	X-LC 3180MX
Column oven:	X-LC 3067CO
Autosampler:	X-LC 3159AS
Detector:	X-LC 3110MD

Conditions:

Column:	ZORBAX Eclipse Plus C18 (3.0 mmID x 50 mmL, 1.8 μ m)
Eluent A:	0.2 % Formic acid
Eluent B:	Acetonitrile
Gradient condition:	((A/B), 0 min(95/5), 1 min(40/60), 1.05 min(10/90), 1.5 min (10/90) 1 cycle; 4 min
Flow rate:	0.8 mL/min
Column temp.:	40°C
Wavelength:	200-650 nm
Injection volume:	1 μ L
Standard sample:	Bis-demethoxycurcumin, Demethoxycurcumin, Curcumin 50 mg/mL each in Water/ Acetonitrile (50/50)

Results

Figure 1 shows the chromatogram and contour plot of the curcuminoid standard mixture. The components were clearly separated within 1 minute.

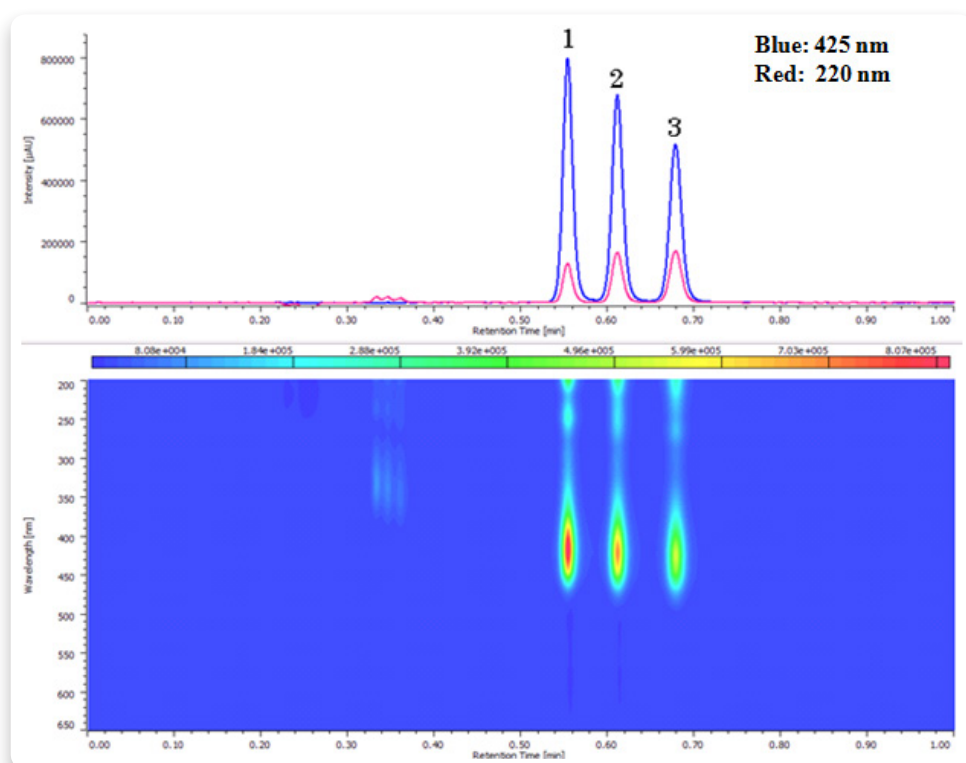


Figure 1. Chromatogram of the Curcumin standard mixture. 1: Bis-demethoxycurcumin, 2: Demethoxycurcumin, 3: Curcumin

Figure 2 shows the on-peak spectra of the components of the curcuminoid standard. High quality spectra were obtained for all three components.

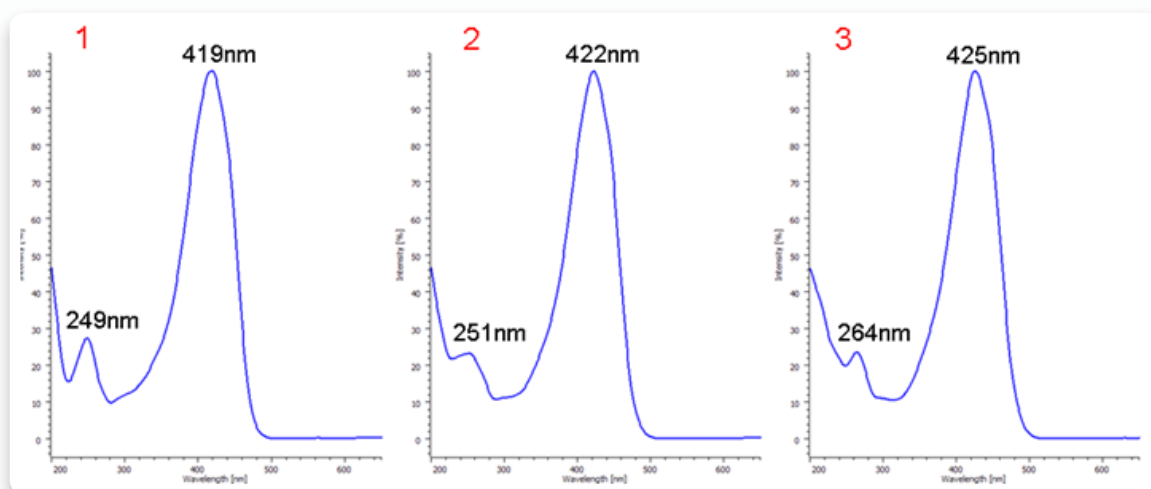


Figure 2. On-peak spectra of the Curcumin standard. 1: Bis-demethoxycurcumin, 2: Demethoxycurcumin, 3: Curcumin

Figure 3 shows the chromatogram of commercial turmeric and the on-peak spectrum of each peak. By registering the spectra of standard components in figure 2, the correlation coefficient was calculated to be as good as 1.000

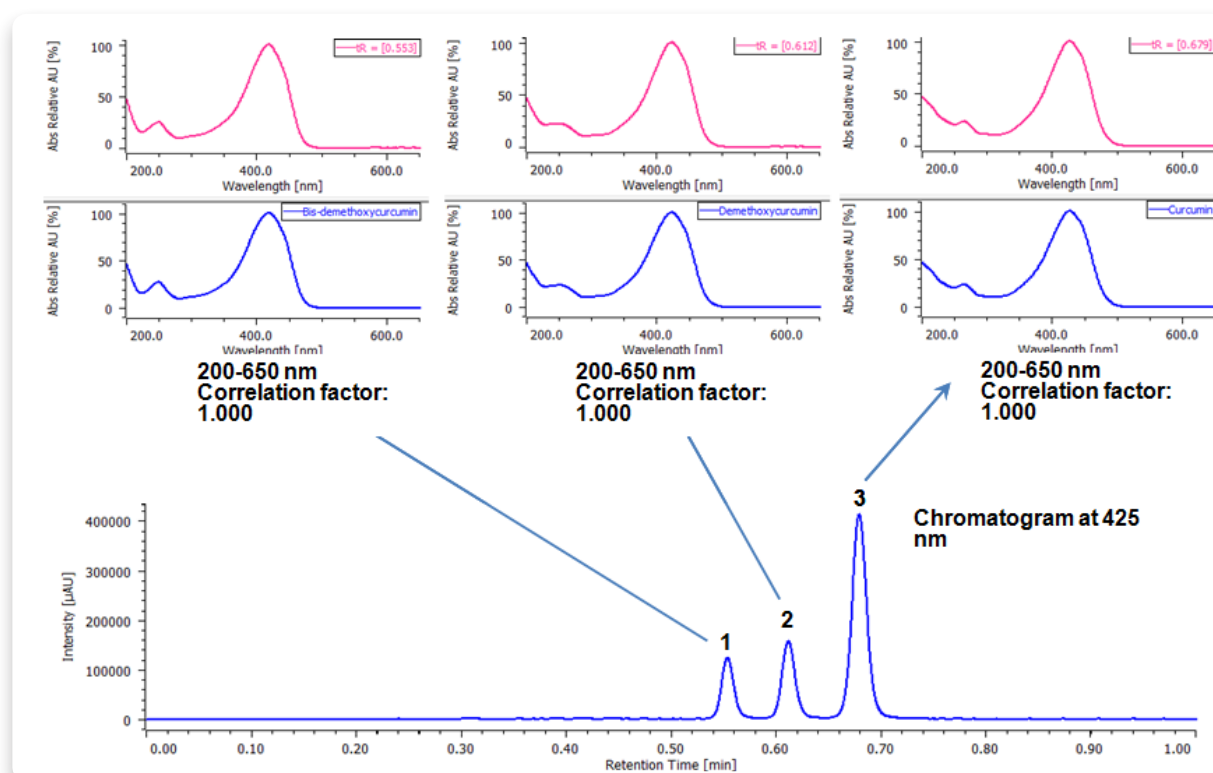


Figure 3. Chromatogram of commercial turmeric. 1: Bis-demethoxycurcumin, 2: Demethoxycurcumin, 3: Curcumin. Preparation: 500 milligrams of turmeric was first dissolved in 5 ml of acetonitrile. After sonication, the supernatant was filtered using 0.45 µm membrane filter, the filtrate was diluted with pure water [1:1] and it was filtered again using 0.2 µm membrane filter.