HPLC Separation of 9 Kavalactones on YMC-Triart C8

Zeshan Aqeel, YMC America

HPLC Application Note

Kavalactones

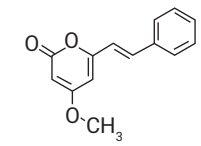
This application note demonstrates the use of YMC-Triart C8 for HPLC potency analysis of 9 Kavalactones.

Background

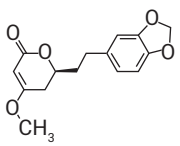
Kavalactones are a class of compounds found in the roots of the kava plant, which is native to the South Pacific. These compounds are responsible for the psychoactive and sedative effects of kava, a traditional beverage consumed for its calming properties. Ongoing research focuses on understanding the pharmacological effects of kavalactones, optimizing extraction methods, and developing new formulations such as tinctures and instant powdered drink mixes. The YMC-Triart C8 column (3 µm, 150 x 4.6 mm) provided acceptable resolution of all the peaks for the standards and the commercial formulation of Kava.

The 9 Kavalactones analyzed (elution order):

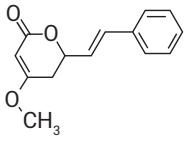
1. Methysticin
2. Dihydromethysticin
3. Kavain
4. Dihydrokavain
5. Yangonin
6. Demethoxyyangonin
7. Flavokavain C
8. Flavokavain A
9. Flavokavain B



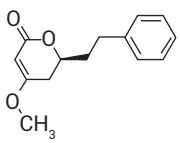
Demethoxyyangonin



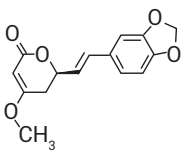
Dihydromethysticin



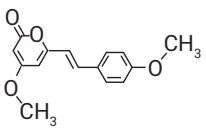
Kavain



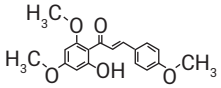
Dihydrokavain



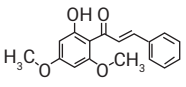
Methysticin



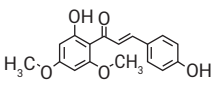
Yangonin



Flavokavain A



Flavokavain B



Flavokavain C

Operating Parameters

Mobile Phase A: 95:5:0.1 Water:Isopropanol:Phosphoric Acid

Mobile Phase B: 70:30:01 Acetonitrile:Isopropanol:Phosphoric acid

Column Temp:	40 °C
Flow rate:	1.2 mL/min
Inj Volume:	0.5 µL @ 100 µg/mL standards; filtered Kava sample
Detection λ:	240 nm (no reference signal)
Column:	YMC-Triart C8; 3 µm, 150 x 4.6 mm (TO12S03-1546WT)
HPLC system:	Agilent 1290 Binary UHPLC system

Gradient:

Time (min)	%B
0	30
0.5	30
15	85
17	85
18	30
22	30

Results and Discussion

The YMC-Triart C8 phase offered softer resolving power for analytes that may differ by only a double bond (i.e. Methysticin and Dihydromethysticin) in some cases, compared to traditional C18 stationary phases.

The addition of isopropyl alcohol to the mobile phase enhanced the selectivity for the kavalactones by adjusting the polarity and hydrophobic interactions. This led to improved peak shape, better resolution, and provided an effective separation of lactones with subtle structural differences.

Conclusions

In conclusion, the YMC-Triart C8 3 µm column demonstrated superior resolution for both Kavalactone standards and a commercially available Kava tincture.

Kavalactones Chromatographs

Figure 1: HPLC separation of 9 Kavalactone Standards

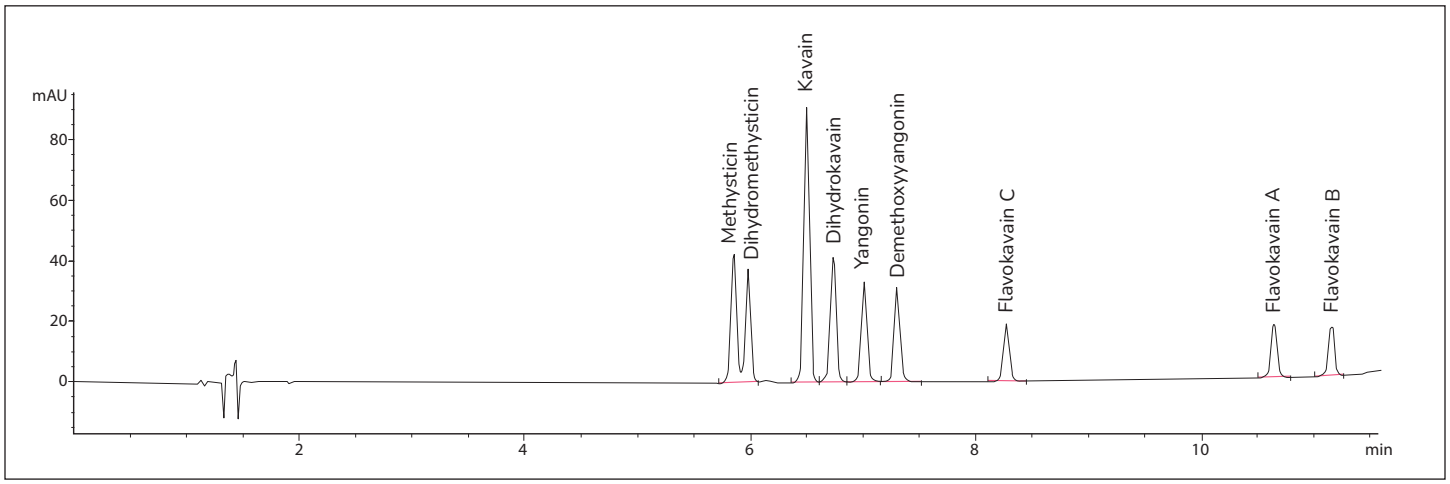


Figure 2: HPLC separation of 9 Kavalactones in a commercial formulation tincture

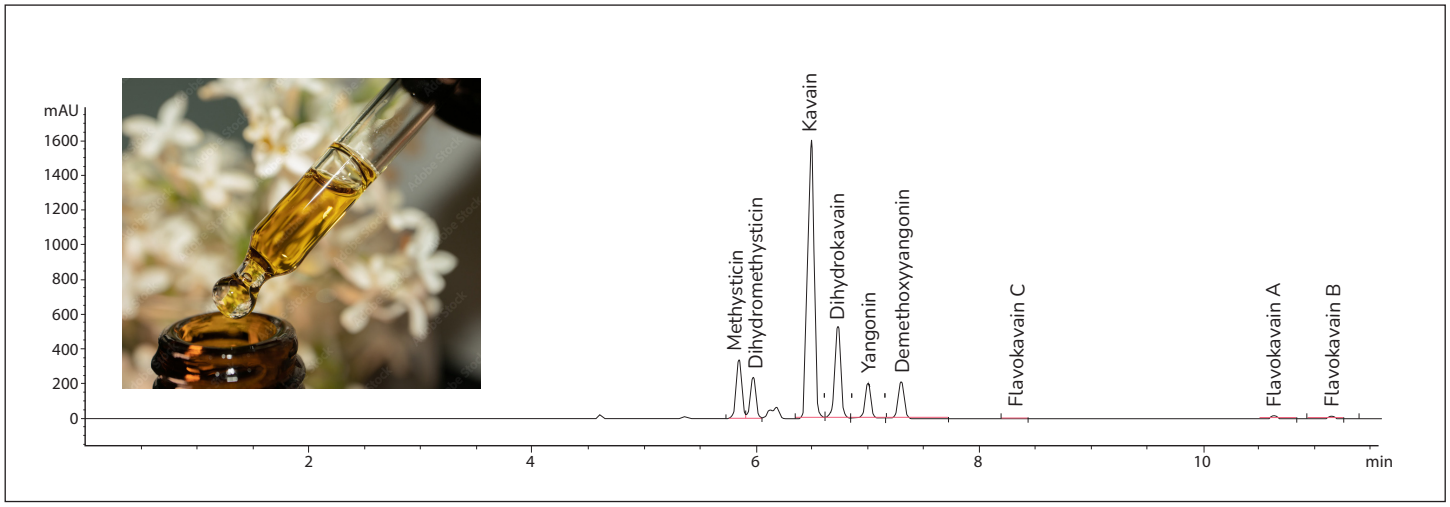


Figure 3: HPLC separation of 9 Kavalactones in a commercial formulation tincture (Zoom in)