

Application News

High Performance Liquid Chromatography

No.L367

High Speed, High Resolution Analysis (Part 17) Analysis of Paeoniflorin in Peony Root

Peony root is an herbal medicine that is often used in Chinese herbal preparations as *paeoniae radix* for its anti-inflammatory, analgesic, antibacterial, hemostatic, and anticonvulsant activity. It is often mixed with other herbal medicines in traditional Chinese herbal remedies.

■ Analysis of Standard Solution

Fig. 1 shows the structural formulas of paeoniflorin and albiflorin, also a constituent of peony root. The Japanese Pharmacopeia specifies that albiflorin be included with paeoniflorin in the resolution solution to verify that separation of the principal substance is adequate.

Here, the retention time of paeoniflorin was observed at about 2 minutes. Table 1 shows the

This Application News focuses on paeoniflorin as one of the principle active substances in peony root, and introduces an example of analysis of paeoniflorin using the ultra high-speed LC system "Prominence UFLC" with the SPD-M20A photodiode array detector.

analytical conditions, and Fig. 2 shows the chromatographic results.

In addition, Fig. 3 shows the overlaid UV spectra of the 2 constituents, obtained using the photodiode array detector. Both show similar spectral patterns with absorbance maxima in the vicinity of 232 nm and 274 nm.

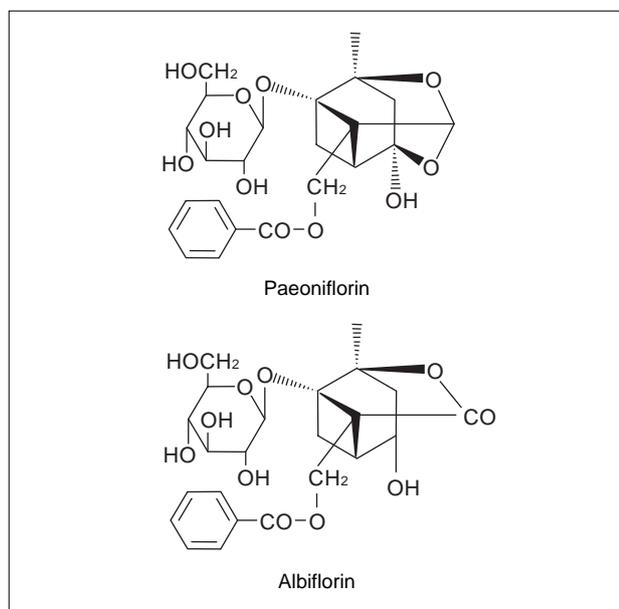


Fig.1 Structures of Paeoniflorin and Albiflorin

Table 1 Analytical Conditions

Column	: Shim-pack XR-ODS (75 mmL. × 3.0 mmI.D., 2.2 μm)
Mobile Phase	: Water / Acetonitrile / Phosphoric acid = 850 / 150 / 1 (v/v/v)
Flow Rate	: 0.9 mL/min
Injection Volume	: 4 μL
Column Temp.	: 35 °C
Detection	: SPD-M20A at 232 nm
Flow Cell	: Semi-micro cell

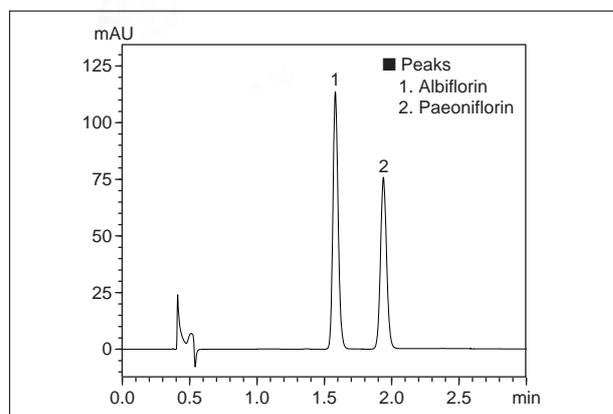


Fig.2 2 Chromatogram of a Standard Mixture of Paeoniflorin and Albiflorin (100 mg/L each, 4 μL injected)

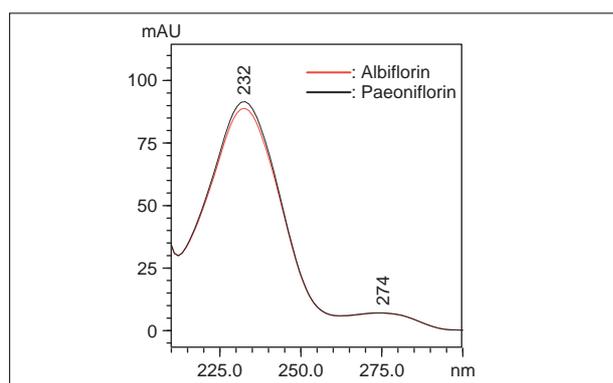


Fig.3 UV Spectra of Paeoniflorin and Albiflorin

■ Analysis of Powdered Peony Root

The powdered peony root was prepared as indicated in Fig. 4, and then analyzed. Fig. 5 shows the chromatographic results. Here, the retention time axis only shows as far as 3 minutes, but since there are some late-eluting substances, the actual analysis was conducted using a 10-minute cycle.

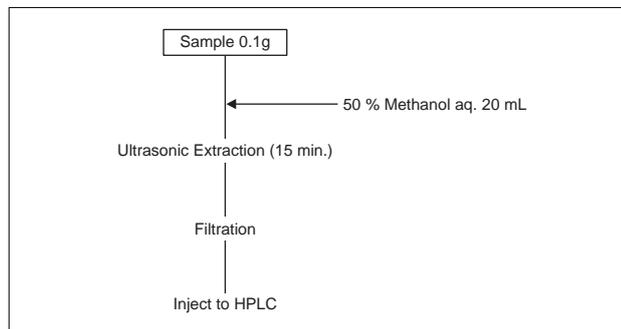


Fig.4 Sample Preparation

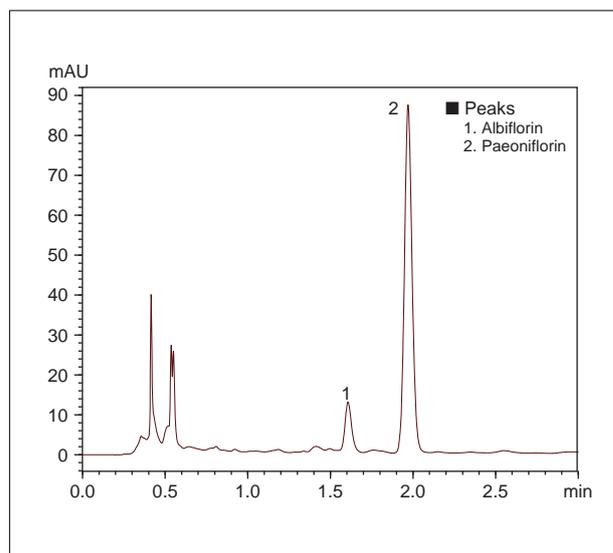


Fig.5 Chromatogram of Powdered Peony Root

The paeoniflorin spectral pattern at the peak apex nearly perfectly matches that of the standard, with a greater than 0.99999 degree of similarity. In addition, when overlaying data at multiple wavelengths, and extracting spectra at different

times from the paeoniflorin peak for a 3-point purity determination, nearly the same pattern was obtained, as shown in Fig. 6. Fig. 7 shows a contour plot of the powdered peony root analysis results.

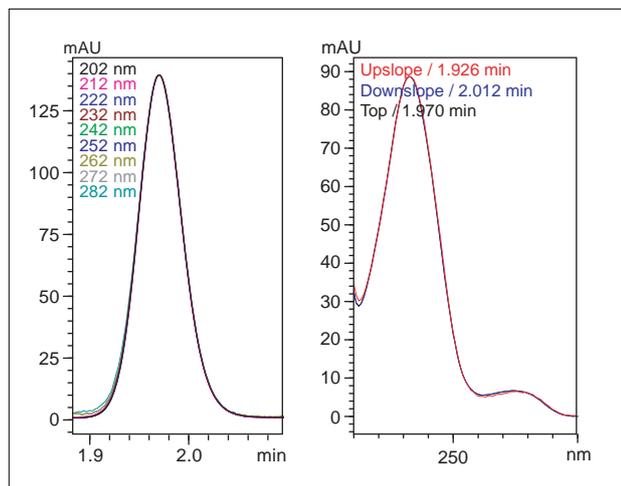


Fig.6 Peak Profile and 3 point-Spectra of Paeoniflorin

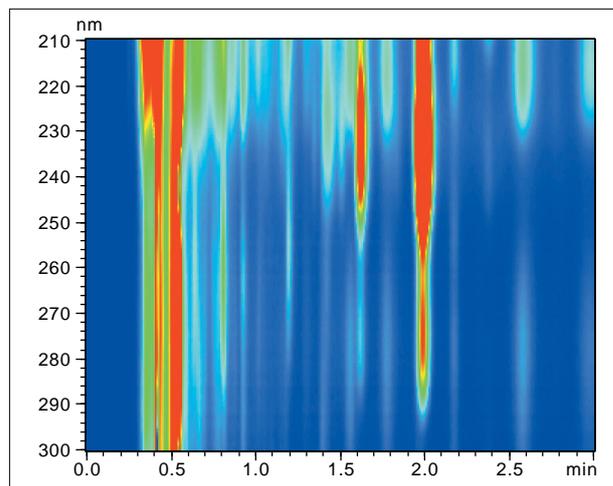


Fig.7 Contour Plot

[References]

The Japanese Pharmacopeia, 15th edition (Society of Japanese Pharmacopeia)

NOTES:

*This Application News has been produced and edited using information that was available when the data was acquired for each article. This Application News is subject to revision without prior notice.



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