

Determination of Catechins in Tea

Application News L299 introduced the analysis of teanin and amino acids in tea. This Application News introduces the analysis of catechins in commercially marketed tea products.

Catechins are being reported in an increasing number of studies to have antioxidant and cancer-controlling

effects, and therefore attracting attention as a substance in commercial drinks.

There are five types of catechin that are known; epigallocatechin, catechin, epigallocatechin gallate, epicatechin, and epicatechin gallate. All these can be analyzed using HPLC.

■ Analysis of Standard Catechins

Fig. 1 shows the structure of the five catechins analyzed in this example: epigallocatechin (EGC), catechin (C), epigallocatechin gallate (EGCG), epicatechin (EC), and epicatechin gallate (ECG).

Fig. 2 shows the result of analyzing the five catechins and caffeine at the same time. The four catechins

other than EGC and caffeine show the maximum absorption between 270 and 280nm, so detection was carried out at 270nm using an UV detector. The analytical conditions are shown in Table 1. The lower limits of detection (S/N = 3.3) for the five catechins and caffeine was 0.7 to 1.3ng.

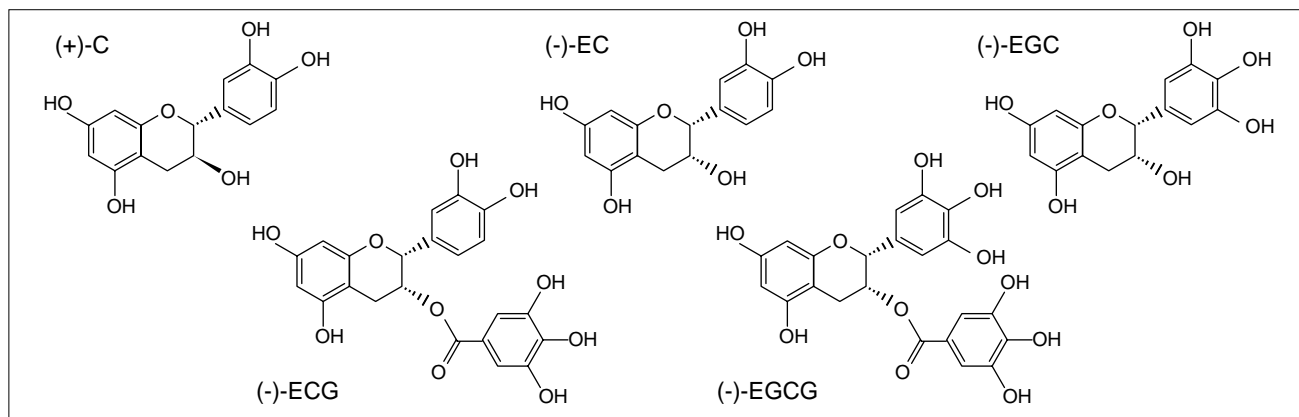


Fig.1 Structure of Catechins

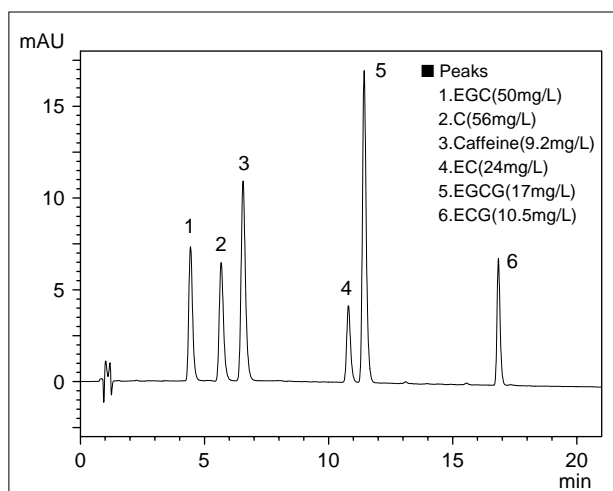


Fig.2 Chromatogram of a Standard Mixture of Catechins and Caffeine

Table 1 Analytical Conditions

Column	: Shim-pack FC-ODS (75mm L. × 4.6mm I.D.)
Mobile Phase A	: 10.0mM (Sodium)Phosphate Buffer (pH2.6)
	B : Acetonitrile
Flow Rate	: 1.0mL/min
Column Temp.	: 40°C
Detection	: UV 270nm
Injection Volume	: 5μL

Time Program		
Time	FUNC	VALUE
0	B.Conc	7
6	B.Conc	7
20	B.Conc	20
20.01	B.Conc	50
25	B.Conc	50
25.01	B.Conc	7
35	STOP	

■ Analysis of Tea

Figs. 3 to 6 show examples of the analysis of commercial green tea, oolong tea, and black tea sold in PET bottles. Each sample was diluted tenfold with

20% methanol solution, and filtrated. The analytical conditions are shown in Table 1.

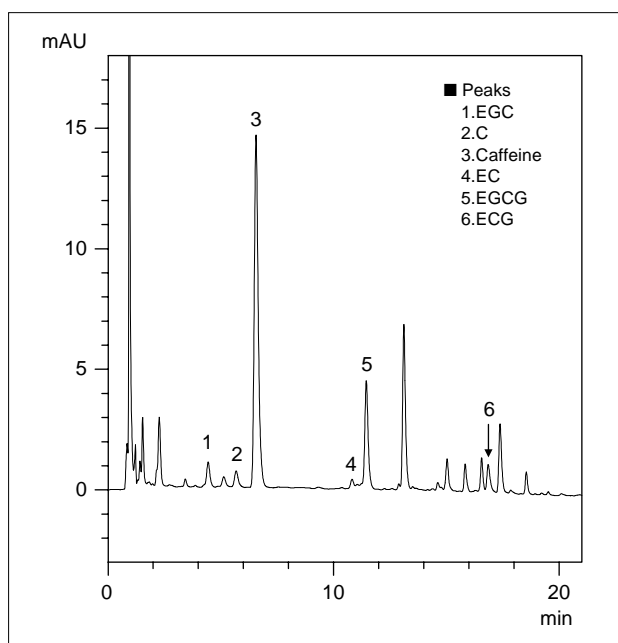


Fig.3 Chromatogram of Green Tea A

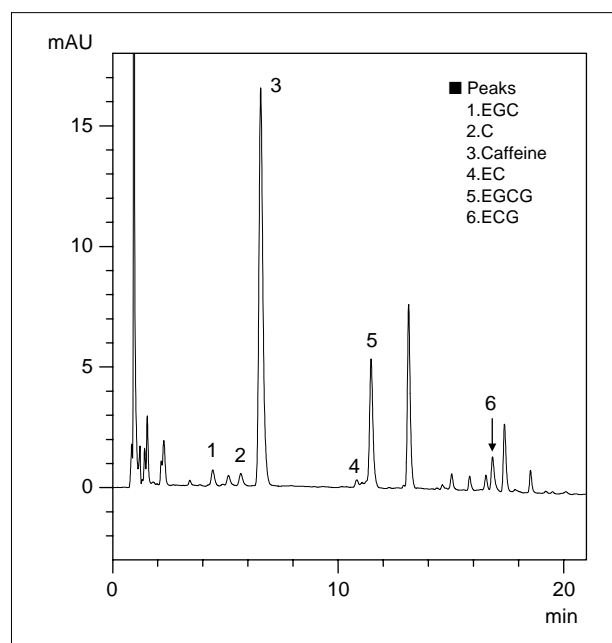


Fig.4 Chromatogram of Green Tea B

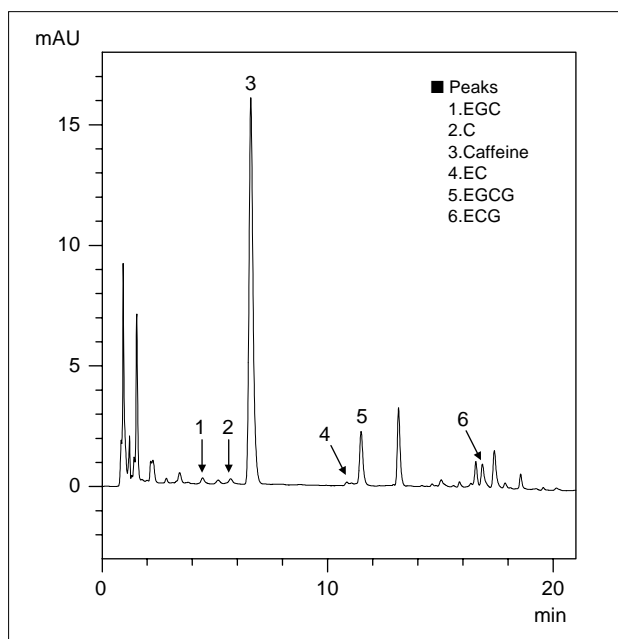


Fig.5 Chromatogram of Oolong Tea

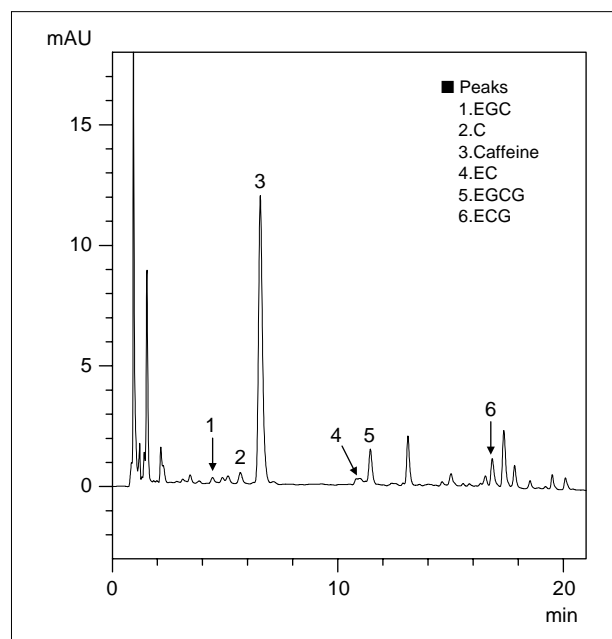


Fig.6 Chromatogram of Black Tea