

## Analysis of Catechins Using LCMS-2010EV

Polyphenols have attracted recent attention as bioactive components in functional foods and drinks. Polyphenols exhibit antioxidant activities, especially, catechins, are known to be key components in tea. This Application News introduces the analysis of the typical catechins shown in Fig.1 ((+)-catechin, (-)-epicatechin, (-)-epigallocatechin, (-)-epicatechin gallate, (-)-epigallocatechin gallate) by LC-MS with electrospray ionization (ESI).

As a proton of a phenolic hydroxyl group is removed from a catechin molecule in ESI process, deprotonated molecule ions  $[M-H]^-$  are produced.

Fig.2 shows mass chromatograms of standards (10 $\mu$ g/mL each) in scan mode. Gradient elution was performed with 0.1% formic acid water and methanol for separation of 5 compounds: (1)(-)-epigallocatechin, (2)(+)-catechin, (3)(-)-epigallocatechin gallate, (4)(-)-epicatechin, (5)(-)-epicatechin gallate. As shown in Fig.3, simple mass spectra were obtained with an m/z peak of  $[M-H]^-$  detected for each of the catechins.

Fig.4 shows the TIC, mass chromatograms of green tea filtered in a 0.45 $\mu$ m membrane filter. Target compounds were completely separated with no interference from other components.

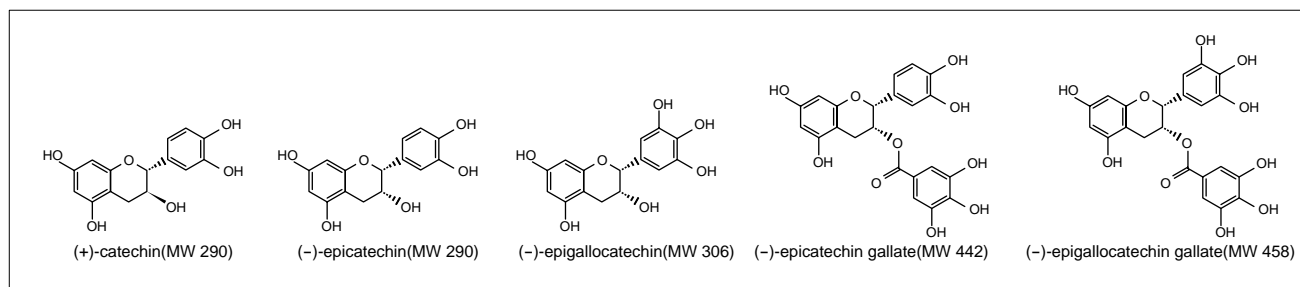


Fig.1 Structures of Catechins

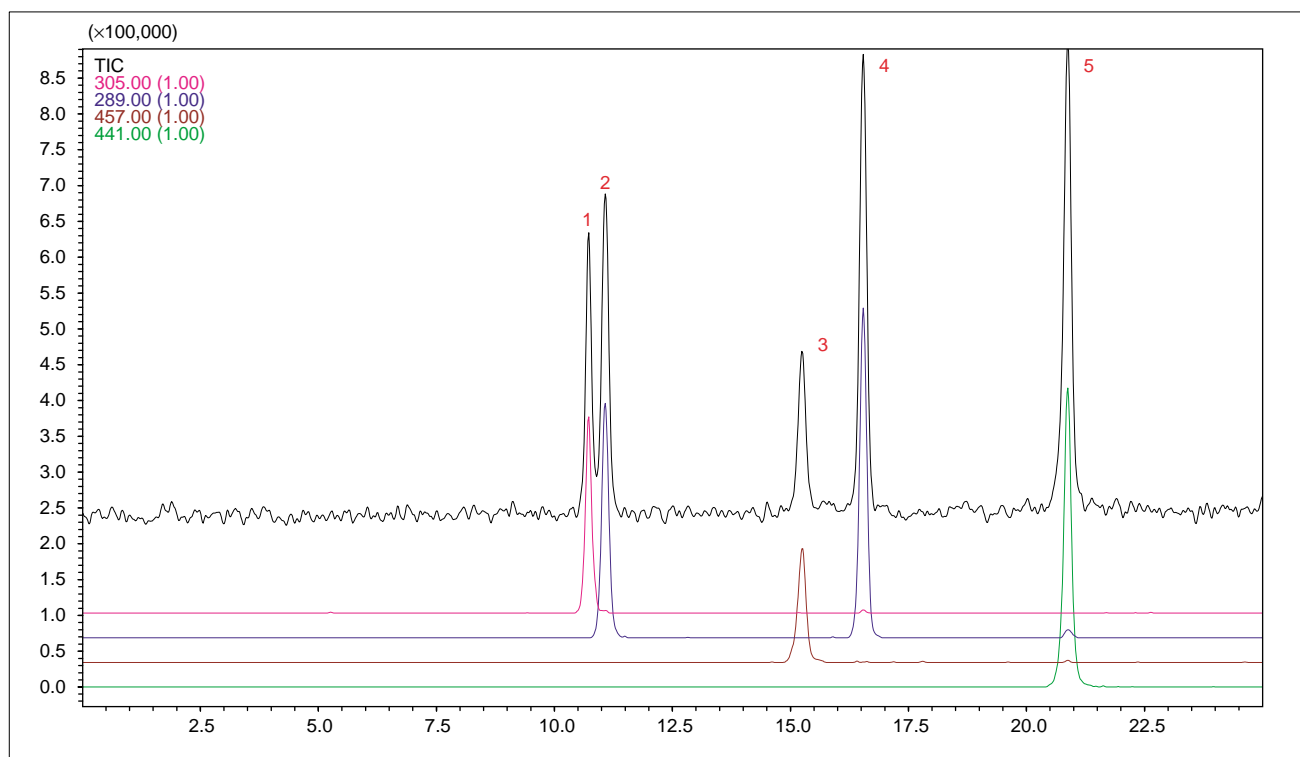
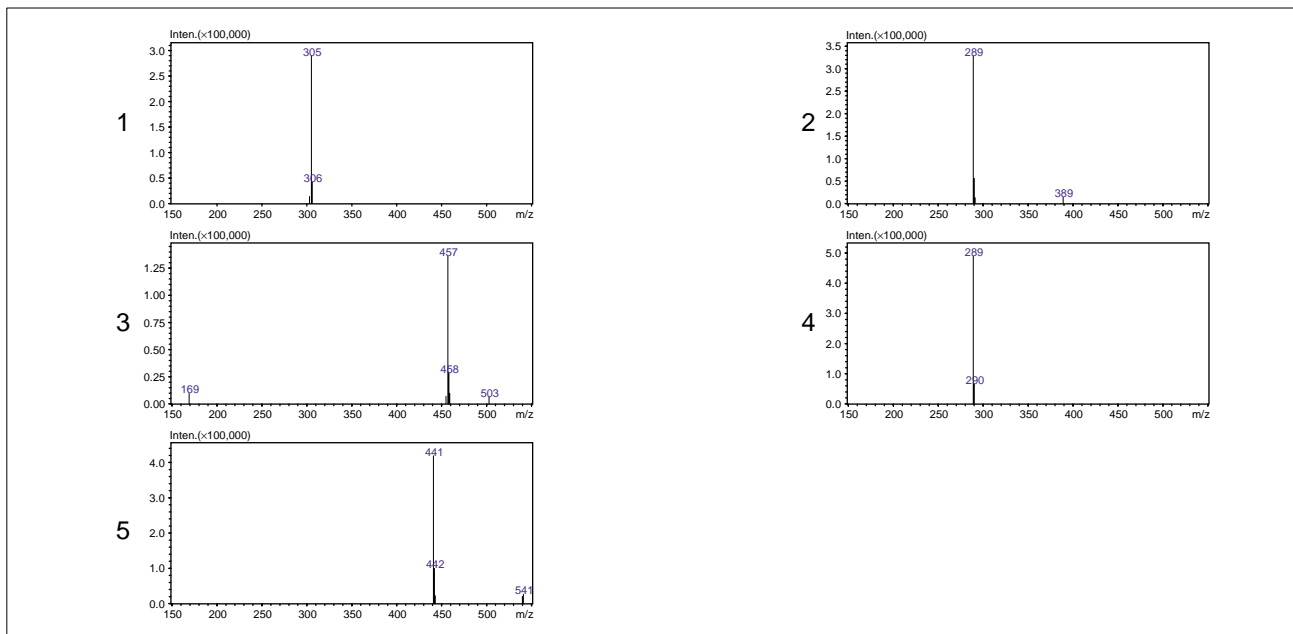


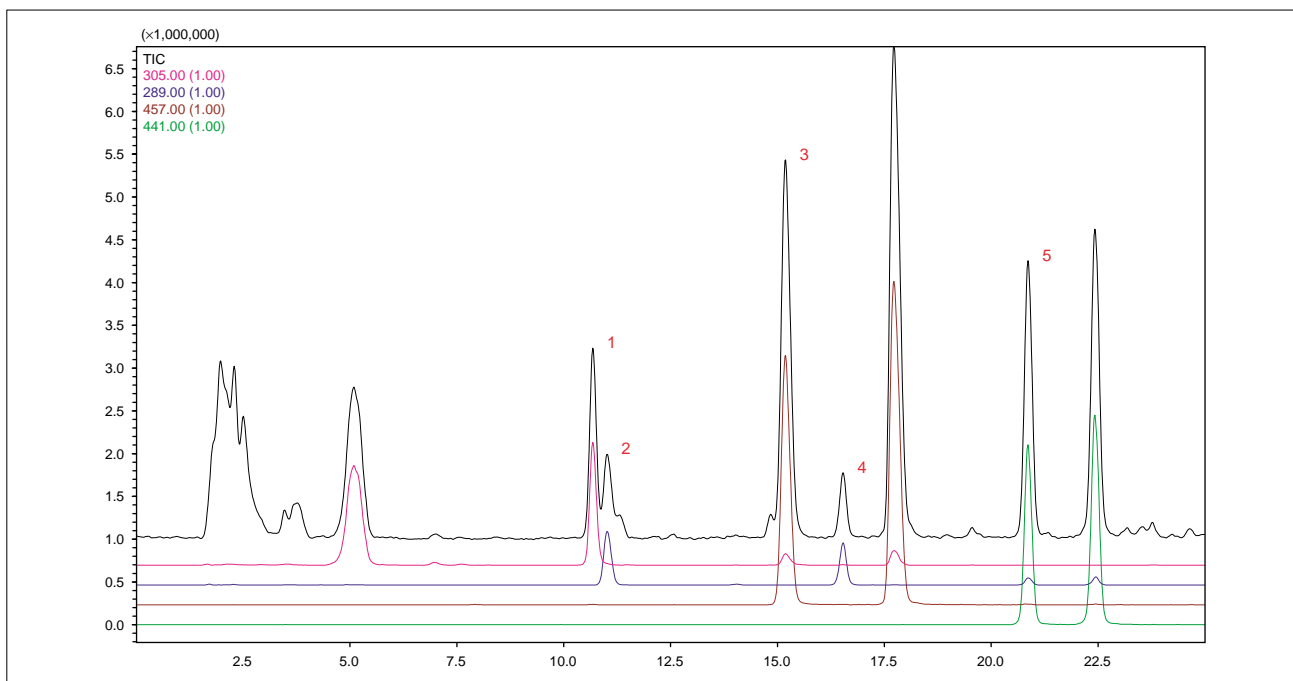
Fig.2 TIC, Mass Chromatograms of Standard Mixture

(1: (-)-epigallocatechin, 2: (+)-catechin, 3: (-)-epigallocatechin gallate, 4: (-)-epicatechin, 5: (-)-epicatechin gallate)



**Fig.3 Mass Spectra of Catechin Standards**

(1: (-)-epigallocatechin, 2: (+)-catechin, 3: (-)-epigallocatechin gallate, 4: (-)-epicatechin, 5: (-)-epicatechin gallate)



**Fig.4 TIC, Mass Chromatograms of Green Tea**

(1: (-)-epigallocatechin, 2: (+)-catechin, 3: (-)-epigallocatechin gallate, 4: (-)-epicatechin, 5: (-)-epicatechin gallate)

**Table 1 Analytical Conditions**

Column	: Shim-pack FC-ODS (150mmL.×2.0mm I.D.)	Probe voltage	: -3.5kV (ESI-Negative mode)
Mobile phase A	: water containing 0.1% formic acid	Nebulizing gas flow	: 1.5L/min
Mobile phase B	: methanol	Drying gas pressure	: 0.2MPa
Time program	: 10%B(0min)→35%B(20min)→80%B(25min) →10%B(25.01-40min)	CDL temperature	: 300°C
Flow rate	: 0.2mL/min	Block heater temperature	: 250°C
Injection volume	: 10μL	CDL, Q-array voltages	: using default values
Column temperature	: 40°C	Scan	: m/z 150-550 (1.0sec)



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