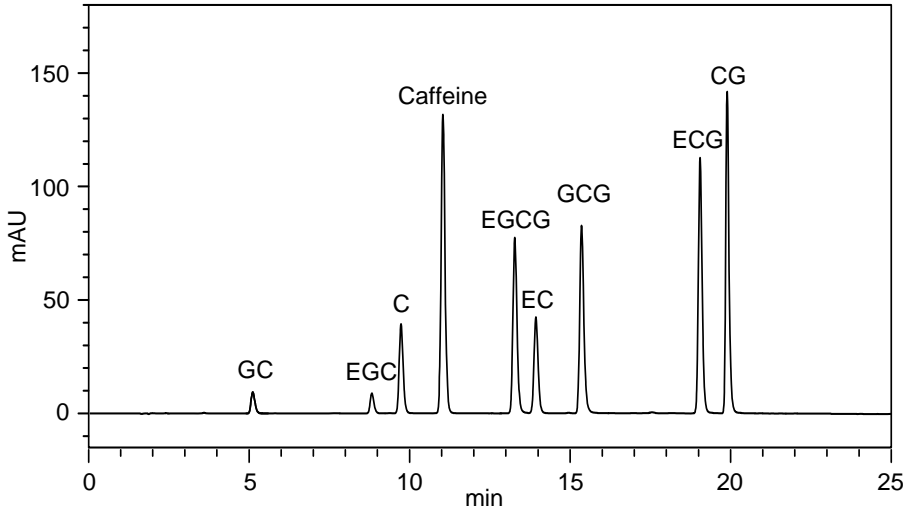
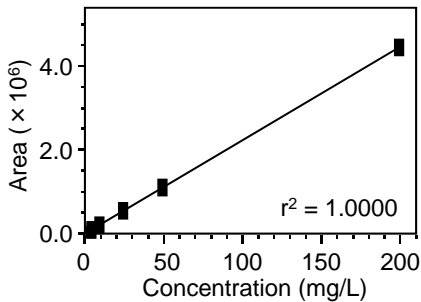


Analysis of Catechins

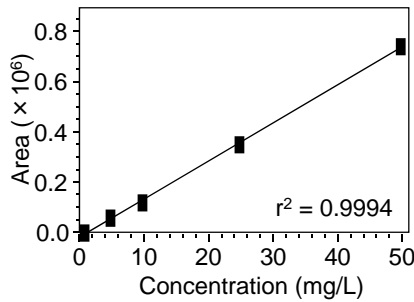
Catechins, a type of polyphenol, is the main ingredient of tea. Its effects and efficacies are various and the functions of catechins are drawing attention. Commercially available green tea drinks in bottles, unlike the tea prepared in tea pots as it has been, contain non-negligible concentrations of thermally isomerized catechins generated during the sterilization process, and the study of the physiological effects is being conducted. The analysis example for caffeine and eight types of catechins in bottled drinks is introduced here.



GC : (-)-Gallocatechin
 EGC : (-)-Epigallocatechin
 C : (-)-Catechin
 EGCG : (-)-Epigallocatechin gallate
 EC : (-)-Epicatechin
 GCG : (-)-Gallocatechin gallate
 ECG : (-)-Epicatechin gallate
 CG : (-)-Catechin gallate



[Calibration Curve of Caffeine]



[Calibration Curve of GCG]

*** Gradient Program

Time (min)	A (%)	B (%)
0.0	90	10
15.0	75	25
25.0	40	60
25.1	90	10
40.0	90	10

The range of the calibration curve is 1 - 50 mg/L (However, 5 - 50 mg/L for EGC and 1 - 200 mg/L for Caffeine)

SAMPLE	10 μ L of Std. Soln. (50 mg/L) *	PRESSURE	
PACKING MATERIAL	HITACHI LaChrom C18 (5 μ m)	TEMPERATURE	40°C
COLUMN SIZE	4.6 mm I.D. \times 150 mm (P/N : 891-5050)	SEPARATION METHOD	Partition
ELUENT	Gradient Program *** (A) 0.05 % v/v H ₃ PO ₄ ** (B) CH ₃ OH / CH ₃ CN = 3 / 2 (v/v)	DETECTOR	UV 280 nm
FLOW RATE	1.0 mL/min	INSTRUMENTS	Chromaster 5110 (Pump), 5210 (Autosampler), 5310 (Column Oven), 5420 (UV-VIS Detector)

NOTE * Stock standard solution : Prepared with methanol to have the concentration of 1 mg/mL for each.
 Standard solution : Prepared by diluting the stock standard solution with purified water to have the concentration of 1-50 mg/L for each.
 The sample was cooled to 10°C.
 ** Special grade H₃PO₄ (85.0%) was used.

KEY WORDS

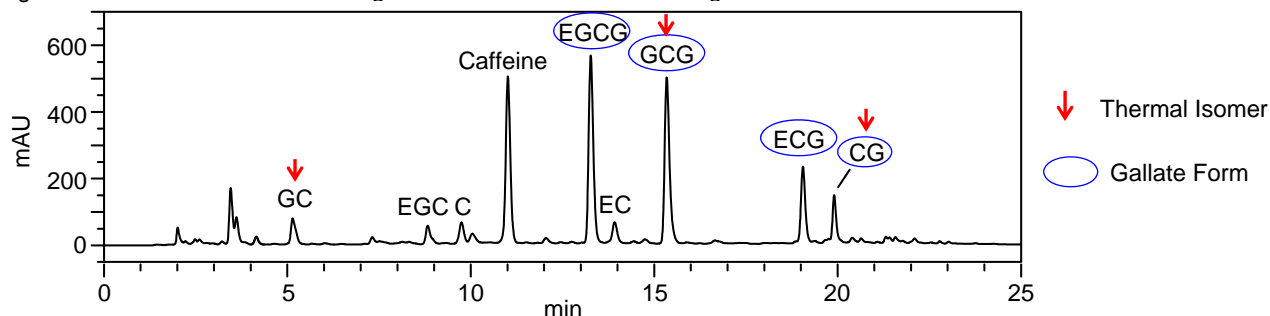
Bio/Medical Science/Food/Pharmaceutical, Food, Food Component, Catechin, Green Tea, Oolong Tea, UV-VIS Spectrometry, Bottled Drink, Chromaster, LaChrom C18, Partition

High Performance Liquid Chromatograph (HPLC)

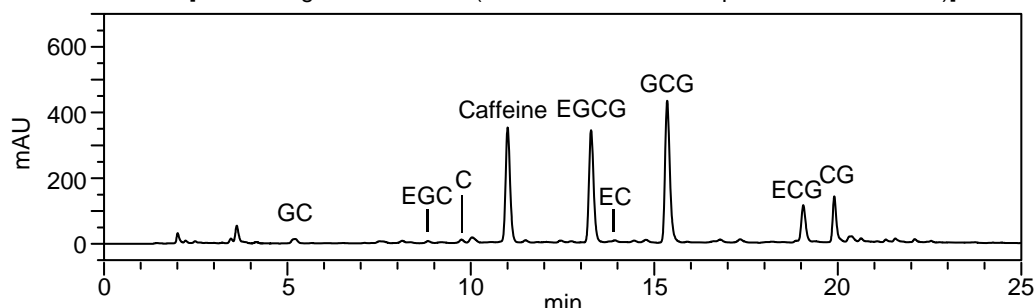
Sheet No. LC110005-01

Analysis of Catechins in Bottled Drinks

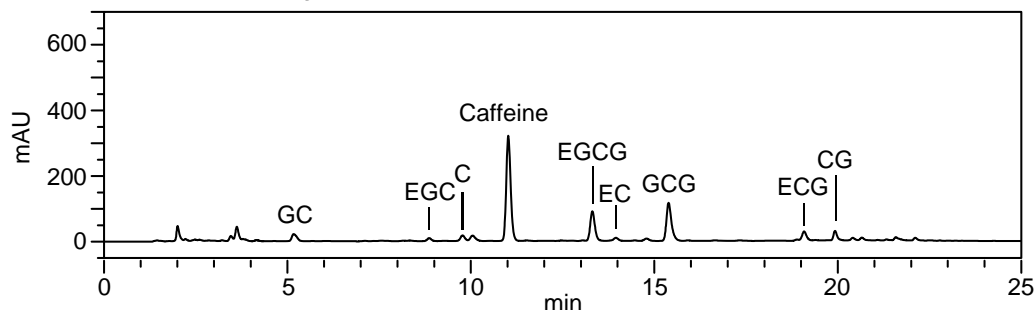
The catechins naturally existing in tea are in the epi-forms and four types, (-)-epigallocatechin gallate (EGCG), (-)-epigallocatechin (EGC), (-)-epicatechin gallate (ECG), and (-)-epicatechin (EC), were detected while thermal isomers, (-)-gallocatechin (GC), (-)-gallocatechin gallate (GCG), and (-)-catechin gallate (CG), were also detected from bottled drinks. It is shown that Drink A, a food for specified health uses, generally contains high concentrations of catechins while Drink B, another food for specified health uses, contains only gallatecatechins having the gallate structure at high concentrations. The effects of gallatecatechins include lowering cholesterol.



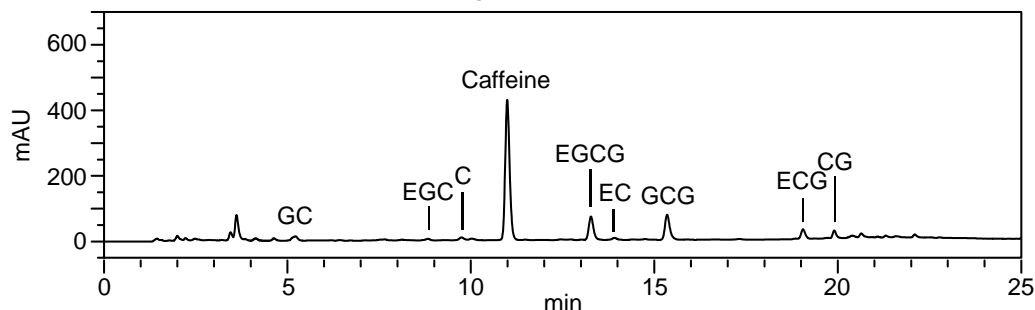
[Chromatogram of Drink A (Green Tea: Food for Specified Health Uses)]



[Chromatogram of Drink B (Green Tea: Food for Specified Health Uses)]



[Chromatogram of Drink C (Green Tea)]



[[Chromatogram of Drink D (Oolong Tea)]

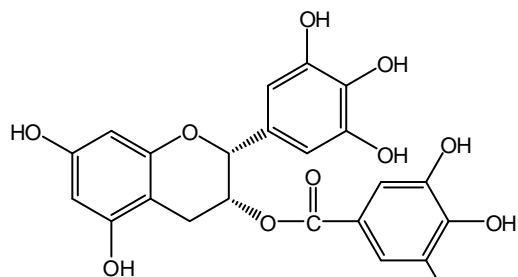
[Sample Preparation Method]
 Filtered through a 0.45 μm filter
 (When the assay is to be performed, it was diluted with purified water to make the concentration within the range of the calibration curve.)

High Performance Liquid
 Chromatograph (HPLC)

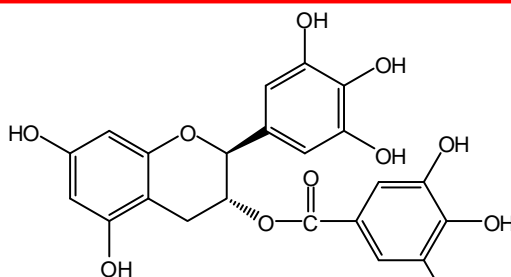
Sheet No. LC110005-02

Chemical Structural Formula of Catechins

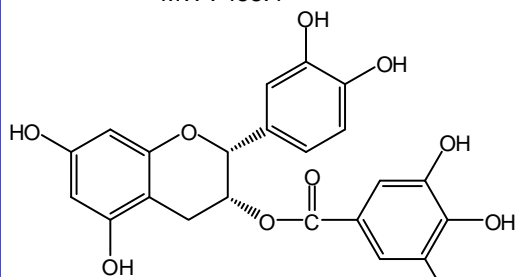
Thermal Isomer



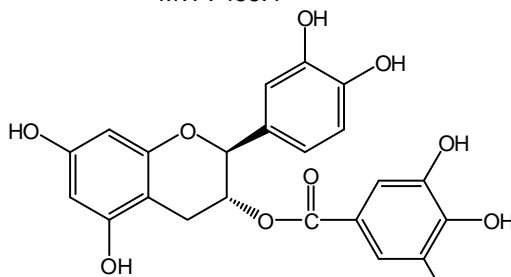
(-)-Epigallocatechin gallate (EGCG)
MW : 458.4



(-)-Gallocatechin gallate (GCG)
MW : 458.4

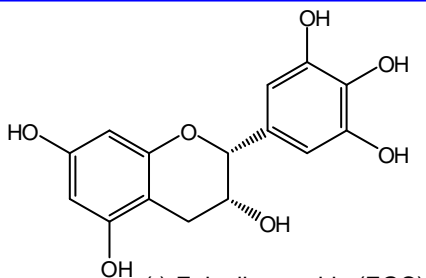


(-)-Epicatechin gallate (ECG)
MW : 442.4

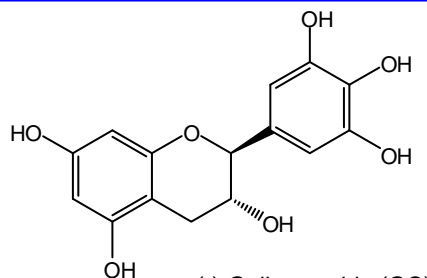


(-)-Catechin gallate (CG)
MW : 442.4

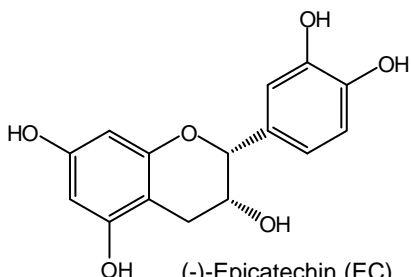
Gallate Form



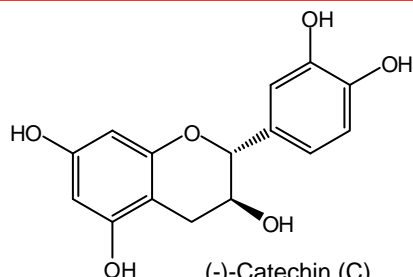
(-)-Epigallocatechin (EGC)
MW : 306.3



(-)-Gallocatechin (GC)
MW : 306.3



(-)-Epicatechin (EC)
MW : 290.3



(-)-Catechin (C)
MW : 290.3

Epi-form, Main Component of Tea

High Performance Liquid
Chromatograph (HPLC)

Sheet No. LC110005-03