Analysis of catechins in tea by HPLC with electrochemical detector

Kuniko Koizumi and Hiroki Kumagai

Food

Abstract

Catechin (C), epicatechin (EC), epigallocatechin (EGC) and epigallocatechingallate (EGCG)—collectively called catechins, have many phenolic hydroxyl groups in the molecule. It is known that catechins have various physiological benefits such as anti-oxidation, anti-bacterium, and anti-tumor effects, as well as the suppression of the increase of cholesterol concentration in blood. Catechins also effect the flavor of foods such as tea, wine, and beer.

This brief demonstrates the analysis of catechins in tea using the Agilent 1100 Series modules and systems for LC with an electrochemical detector.

Analyzed Compounds

(+)-catechin,
(-)-epicatechin
(-)-epigallocatechin
(-)-epigallocatechingallate

Sample

Green tea, tea and woolong tea

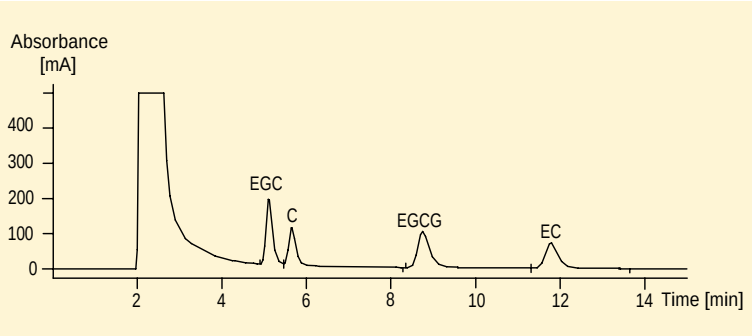


Figure 1
Chromatogram of standard solution, 2 mg/L each

Conditions

Column
250 x 4.0 mm Hypersil BDS
(Agilent Parts No: 79926 OB-584)
Mobile phase
Methanol: (2g $NaNO_3$ + 0.05 g H_2SO_4 in 1l Water) = 22:78
Column temp 25 °C
Injection vol 20 µl
Detector
Agilent 1049 Electrochemical detector
Mode
Amperometry Working electrode; glassy carbon. Applied Potential:0.850 V

Sample preparation
Green tea, tea and woolong tea were diluted with water and filtrated.

Agilent Technologies
Innovating the HP Way

Method Performance

Limit of detection
0.26–2.00 ng (S/N = 3)

RSD of peak area
0.73–1.14 %

RSD of retention time
0.09–0.14 %

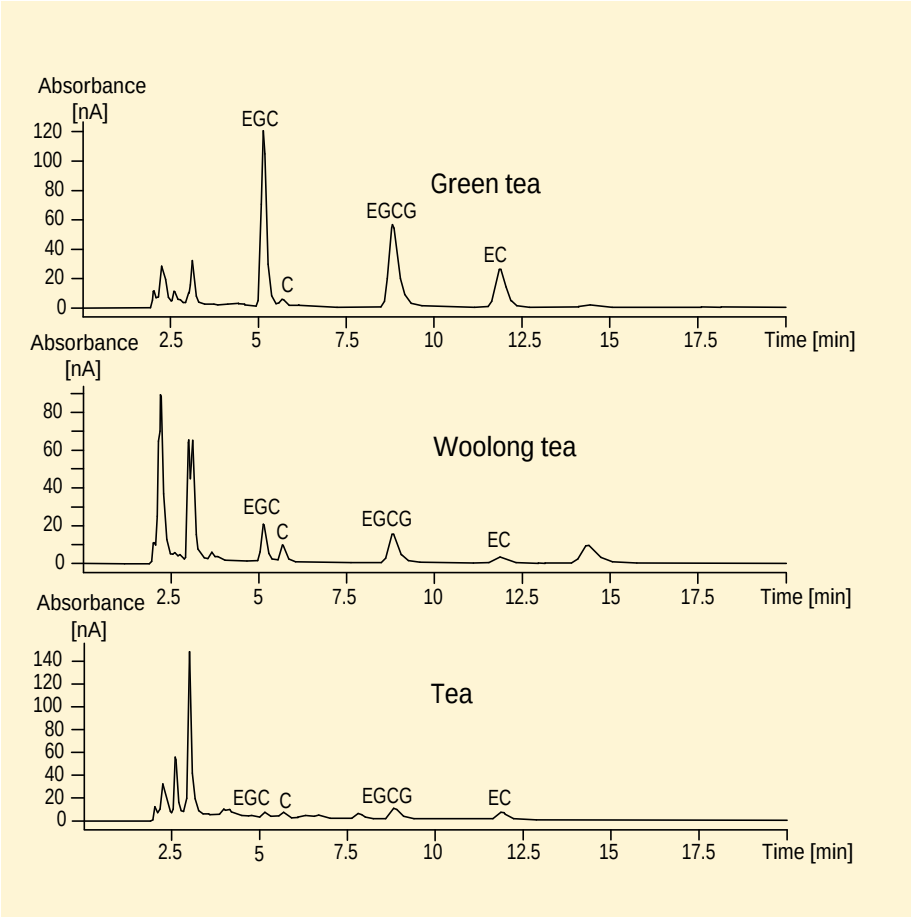
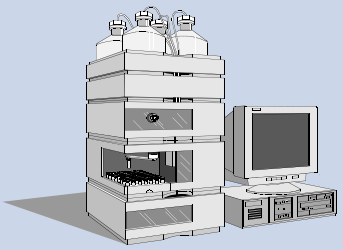


Figure 2
Chromatogram of catechins in various teas

Equipment

Agilent 1100 Series
- binary pump with
- vacuum degasser
- autosampler
- thermostatted column compartment
- programmable electro chemical detector
- diode array detector

Agilent ChemStation + software



Kuniko Koizumi and Hiroki Kumagai are application engineers based at Yokogawa Analytical Systems Inc., Tokyo, Japan.

For more information on our products and services, visit our worldwide website at http://www.agilent.com/chem

Released 10/97
Publication Number 5965-9802E

Agilent Technologies
Innovating the HP Way