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Phenolic Compounds of *Quercus infectoria* O. Roots by High Performance Liquid Chromatograph (HPLC)

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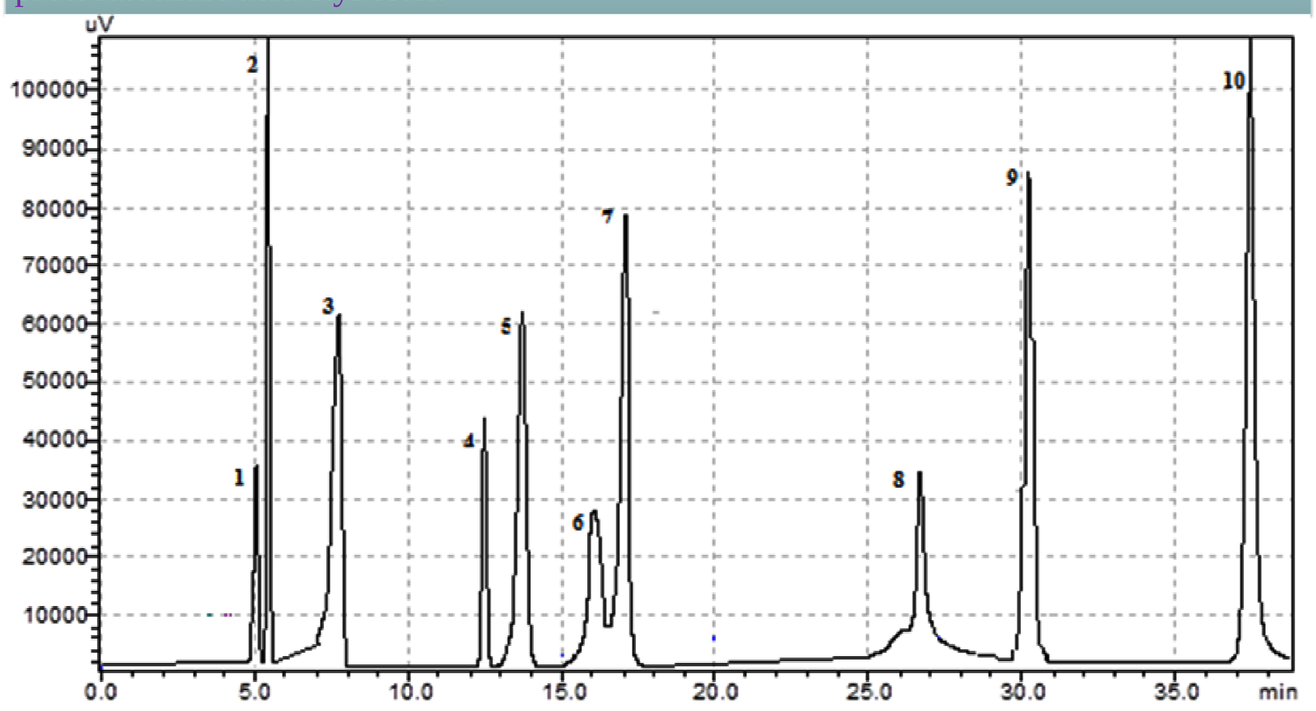
Typical chromatograms of the standard mixture. (1) Fumaric acid, (2) Gallic acid, (3) (-) Gallocatechin, (4) Catechin, (5) t-3-hydroxy cinnamic acid,, (6) Cafeic acid, (7) syringic acid, (8) Ellagic acid, (9) t-3 hidroksicinnamic acid, (10) protocatechuic acid etyl ester.

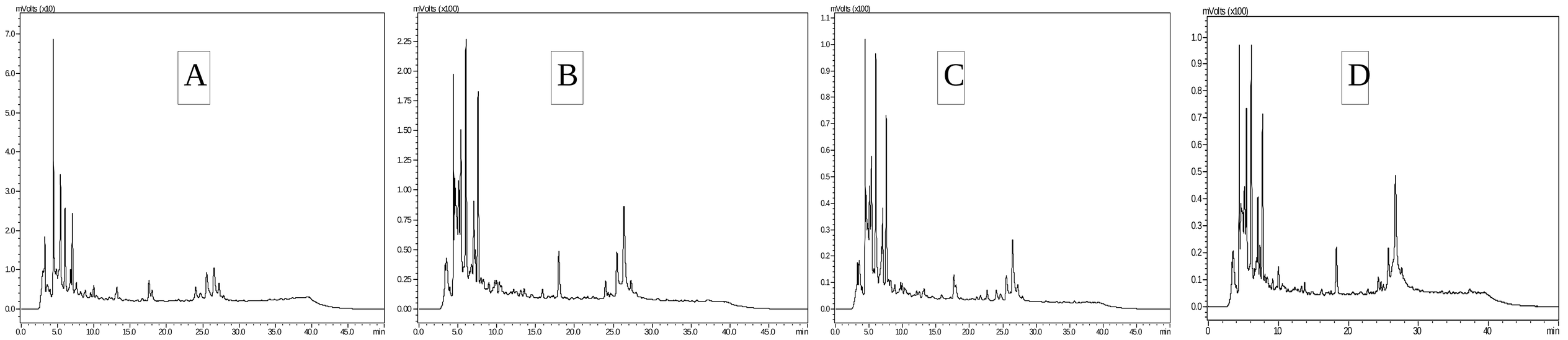


Regression equation, retention time, correlation coefficient of reference compounds on HPLC

No	Reference Compound	Retention Time (min)	Regression equation[a]	Correlation coefficient (r^2)
1.	Caffeic acid	16,10	y = 1E-05x	0.9978
2.	(-) Gallocatechin	7,70	y = 5E-05x	0.9930
3.	Fumaric acid	5,13	y = 0,0006x	0.9986
4.	Gallic acid	5,41	y = 7E-06x	0.9993
5.	Catechin	12,44	y = 5E-05x	0.9920
6.	Protocatechuic acid ethyl ester	37,44	y = 3E-05x	0.9957
7.	Syringic acid	17,06	y = 2E-05x	0.9834
8.	t-3-hydroxycinnamic acid	30,53	y = 6E-06x	0.9812
9.	4-hydroxybenzoic acid	13,73	y = 1E-05x	0.9865
10.	Ellagic acid	26,61	y = 9E-06x	0.9850

[a] x: peak area of components, y: concentration of components

Typical HPLC chromatograms of the *Q. infectoria* for (A) 30, (B) 60, (C) 90 and (D) 120 min extraction time respectively in conventional extraction method.



No	Chemical Compounds	Extraction time (min) 30		60		90		120	
		mg/kg	%[1]	mg/kg	%[2]	mg/kg	%[3]	mg/kg	%[4]
1.	Caffeic acid	1,7	0,545	0,97	0,661	0,4	0,488	0,22	0,392
2.	Ellagic acid	0,01	7,694	7,32	9,523	6,06	7,524	4,55	17,081
3.	Fumaric acid	2,33	2,712	290,06	8,170	163,07	8,600	90	7,339
4.	Gallic acid	2,55	14,866	6,65	10,212	3,42	10,821	2,62	9,890
5.	Catechin	0,26	0,362	1,03	0,420	2,03	0,587	0,5	0,341
6.	Protocatechuic acid ethyl ester	0,1	0,810	1,05	0,826	0,32	0,280	0,7	0,355
7.	Siringic acid	-	-	0,11	0,136	0,25	0,273	0,13	0,160
8.	t-3-hydroxy cinnamic acid	-	-	0,12	0,151	-	-	-	-
9.	4-Hydroxy benzoic acid	-	-	0,25	0,529	0,12	0,170	0,31	0,453
10.	(-) Gallocatechin	6,62	2,990	68,9	10,225	26,61	9,920	26,17	8,333

Abstract

The aim of the present work was to identify the extractable phenolic compounds in the roots of Turkish Kermes oak (*Quercus infectoria O.*). The roots were obtained from Kahramanmaras province of Turkey. The roots were extracted by using conventional hot water extraction method as a function of time. Phenolic compounds were determined by using high performance liquid chromatography (HPLC). Moreover, it is found that about 30-44 % of the total compounds in the oak roots were determined by HPLC for all the extractions. The results showed that ten active compounds were found in the oak roots. Concentration (mg/kg) and percent amount of the total compounds differed in the extraction time for all the compounds.

The main compounds in the oak roots were determined (about 2-290) fumaric acid, (about 6-68) gallocatechin, (about 4-7,) ellagic acid and (about 2-11) gallic acid for all the extraction time as mg/kg (ppm) quantitatively. The results for percent amount of major compounds in all the extraction time indicated that *Q. infectorica* roots primarily contained gallic acid, ellagic acid and (-) gallocatechin.

Key Words: *Quercus infectoria O.*, phenolic compounds, active compounds, extraction times, HPLC.