

Quantification and Varietal Variation of Fatty Acids in Mulberry Fruits

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Objectives

Mulberry containing many bioactive components is very useful as functional food resource. Mulberry leaf ice cream, mulberry leaf tea, mulberry noodle, mulberry fruit jam, mulberry wine etc. have been developed in Korea. Because mulberry fruit has abundant natural pigments belonging to anthocyanins, we can expect their therapeutic and physiological effects. However, there are few reports about mulberry seed. So we studied on fatty acids of mulberry seed for the purpose of increasing the functional utilization of mulberry fruit.

Materials and Methods

Materials : Mulberry seed (49 accessions)

Method : One-step extraction/methylation method, Rafael and Mancha(1993)

Capillary GC analysis : Agilent 6890 system(HP Co., Wilmington, DE, USA), FID detector, HP-Innowax capillary(30m× 0.25mm× 0.25 μ m) film(cross-linked polyethylene glycol) column, FAME(fatty acid methyl ester) Mix(C14-C22) from Supelco(Bellefonte, PA, USA)

Results and Discussion

Fatty acids analysis was carried out with mulberry seed. Palmitic acid, stearic acid, oleic acid and linoleic acid were detected as a major fatty acid. Their rates of composition were 8.8± 3.3, 4.2± 1.6, 5.8± 2.3, and 81.2± 6.9(%), respectively. The unsaturated fatty acids such as oleic acid and linoleic acid were abundant in mulberry seed. Particularly, five accessions including "Gukkwang", "Jaelaenosang", "Sangbansibmunja (Jeonnam)", "Neunggeum" and "Suwonnosang" were observed only with linoleic acid. Unsaturated fatty acids are known to have physiological effects decreasing the serum cholesterol. From the above result, we confirmed that mulberry fruit had abundant unsaturated fatty acids and anthocyanin pigments, and it was of great value as functional food resource.

Table 1. Analysis of fatty acids of mulberry seed with different varieties.

No.	Accessions	Composition of fatty acids(%)			
		16:0	18:0	18:1	18:2
1	452	10.5	4.0	6.1	79.4
2	Amloesang	9.3	5.4	6.9	78.3
3	Cheongilppong	8.8	4.3	5.4	81.5
4	Cheongsipyung	8.5	4.4	6.8	80.3
5	Daegajokhongpisang	9.3	5.0	5.6	80.1
6	Daemansang	10.7	4.4	5.5	79.4
7	Eoguknosang	9.9	4.6	5.0	80.5
8	Ficus	9.2	4.4	6.1	80.4
9	Ficus 4X	10.8	4.1	5.7	79.4
10	Gasaeppong	8.4	5.5	7.4	78.7
11	Geunanosang	9.6	4.3	7.0	79.2
12	Gosu 9	9.8	5.2	6.4	78.5
13	Gukkwang	0.0	0.0	0.0	100.0
14	Gwandongnae B	10.2	3.8	8.5	77.6
15	Haenam 1	9.2	4.9	5.9	80.0
16	Hasusang	9.2	4.5	6.3	80.0
17	Hwachosipmunja	9.5	4.0	6.4	80.2
18	Hwansipchosaeng	10.3	5.7	5.0	79.1
19	Hwanyoupkgeomji	9.3	4.3	6.5	79.9
20	Iran N	14.2	4.2	7.3	74.3
21	Jaelaenosang	0.0	0.0	0.0	100.0
22	Jangsosang	8.8	5.0	7.7	78.4
23	Jasan	9.6	4.4	6.2	79.8
24	Jeolgokchosaeng	9.8	4.9	5.5	79.8
25	Junggojo	8.9	5.2	7.2	78.7
26	Kaeryangchosaengsipmunja	10.0	4.4	7.4	78.2
27	Kangsun	9.4	4.5	6.0	80.1
28	Kangwon 76/5/8	7.7	4.8	6.5	81.0
29	Kuksang 13	9.6	3.9	6.3	80.2
30	Moksang	8.7	4.5	7.2	79.6
31	Naesujeon 100/3	8.8	4.7	8.1	78.4
32	Naesujeon 103/A	16.4	7.6	12.3	63.7
33	Neunggeum	0.0	0.0	0.0	100.0
34	Odamsanjang	9.0	4.2	5.6	81.2
35	Palcheongsipyung	9.6	4.6	6.0	79.7
36	PC 11	9.7	2.9	8.6	78.7
37	PC 5	8.3	4.3	6.7	80.7
38	Pilipin 1	9.4	4.5	5.9	80.2
39	Sabangso	9.9	4.5	5.4	80.2
40	Sangbansibmunja(jeonnam)	0.0	0.0	0.0	100.0
41	Sangchonchosaeng	11.0	6.0	4.7	78.4
42	Seoban	9.0	4.0	4.5	82.4
43	Sinbaekgeum	9.2	4.3	5.5	81.0
44	Sinsang 1	12.6	5.4	5.2	76.8
45	Sobeun	10.1	4.7	5.3	79.9
46	Suwonnosang	0.0	0.0	0.0	100.0
47	Taejeonchosaeng	8.9	4.3	6.2	80.7
48	Wongo	11.2	5.9	6.2	76.7
49	Wonwoowimun	9.4	4.2	6.8	79.6
	Mean± S.D	8.8± 3.3	4.2± 1.6	5.8± 2.3	81.2± 6.9

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