

Manufacture of Spring Black Tea with Newly Developed Korea Tea Cultivar and Their Physiochemical Properties

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ABSTRACT

Novel Korea Tea cultivar, “Bohyang” was harvested to produce high quality black tea and further investigated its physiochemical properties and sensory evaluation. High quality black tea was manufactured by withering (55, 60, 65, and 70% moisture content), rolling (20, 25, 30, and 40 min) and fermenting (90, 120, 150, 180 min) processes. For withering step, tea leaves with 60% moisture content showed higher amounts of total amino acid (8.92%), catechin (2.15%), free sugar (2.66%), and quality factors. Longer rolling period led to decreased total amino acid, catechin, and free sugar contents but improved a color value. Fermentation was optimum for 150 min since black tea contained increased total amino acid, catechin, free sugar contents, and improved sensory factors. In conclusion, high quality black tea was successfully produced by the means of processing by withering at 60% moisture content, rolling for 30 min and fermentation for 150 min with Korea Bohyang tea cultivar

MATERIALS & METHOD

- Bohyang and native green tea from tea industry institute
- Fermentation time (25°C, 90~180분), Moisture content (70~ 55%),
- Detection: color, catechnin, free sugar
- Color- grinded black tea 500mg+ 60% MeOH addition, 10 min sonication and filtered at 25C for 20 min.
- Spectrophotometer(MINOLTA CM-3600d) L, a, b values
- Sensory evaluation with taste, color, aroma, overall values
- Total phenolics Folin-Denis method, Total flavonoids, Lister et al method, catechnin, High performance liquid chromatography analysis
 - HPLC system Agillant 1260, UV detector 280nm, 20uL injection
 - Column : ZORBAX Eclipse plus C18 (250mm*4.6mm, 5um)
 - Mobile phase : Water in 0.01% AA/ACN in 0.01% AA
 - Flow rate : 1.0mL/min, column temperature : 30°C

RESULTS & CONCLUSIONS

Table 1. Black tea product quality on various water content

Tea water content [%]	varieties	TAA	CA	Catechin mg/ml	Sucrose Total [%]	A value		Sensory score
						Tea	water	
70	Native	8.23	3.34	50.8	2.41	0.88	13.8	6.7
	Bohyang	8.76	3.59	34.5	2.46	0.77	12.5	6.8
65	Native	8.40	3.39	33.5	1.81	0.73	12.4	7.0
	Bohyang	8.56	3.62	24.6	2.51	0.72	14.9	7.2
60	Native	8.60	3.46	33.1	2.49	0.72	14.6	6.2
	Bohyang	8.93	3.72	21.5	2.66	0.80	17.8	7.3
55	Native	8.55	3.37	41.6	2.28	0.80	11.4	6.2
	Bohyang	8.69	3.32	31.8	2.62	0.80	13.5	6.8

* Total Amino acid (TAA); caffeine (CA)

Table 2. Black tea product quality on various rubbing period

Rubbing Time (min)	varieties	TAA	CA	Catechin mg/ml	Sucrose Total [%]	Sensory score		
						Tea	water	
20	Native	8.31	3.55	50.8	1.33	0.77	12.4	6.3
	Bohyang	7.75	3.40	30.5	2.14	0.77	13.0	6.8
25	Native	7.25	3.47	38.7	1.36	0.81	11.5	6.5
	Bohyang	7.71	3.39	23.6	2.30	0.72	15.3	7.0
30	Native	8.51	3.44	25.3	1.48	0.75	14.0	6.8
	Bohyang	8.65	3.57	19.6	2.06	0.70	16.7	7.7
40	Native	8.57	3.41	24.9	1.48	0.75	14.6	6.5
	Bohyang	8.61	3.72	19.1	2.25	0.71	17.0	7.2

Table 3. Black tea product quality on various fermentation period

Ferm. Time (min)	varieties	TAA	CA	Catechin mg/ml	Sucrose Total [%]	Sensory score		
						Tea	water	
90	Native	8.31	3.55	49.8	1.20	0.77	13.1	6.0
	Bohyang	8.75	3.63	37.4	2.31	0.76	13.7	7.0
120	Native	9.25	3.47	40.6	1.96	0.75	13.0	6.7
	Bohyang	8.80	3.65	22.3	2.36	0.67	16.3	7.1
150	Native	9.51	3.44	35.3	2.32	0.80	14.3	6.8
	Bohyang	8.87	3.64	21.6	2.58	0.70	16.7	7.7
180	Native	9.07	3.41	32.2	2.49	0.78	14.0	6.5
	Bohyang	9.12	3.64	20.2	2.43	0.71	16.5	7.2

Table 4. Black tea product quality on various drying period

Drying Temp. [°C]	varieties	TAA	CA	Catechin mg/ml	Sucrose Total [%]	Sensory score		
						Tea	water	
100	Native	8.51	3.52	31.4	1.20	0.82	12.6	6.0
	Bohyang	8.82	3.27	29.6	2.31	0.65	13.4	7.0
110	Native	8.40	3.51	27.4	1.96	0.68	14.2	6.7
	Bohyang	8.93	3.28	18.5	2.36	0.70	15.2	7.1
120	Native	8.50	3.43	24.0	2.32	0.73	14.5	6.8
	Bohyang	8.57	3.36	16.7	2.58	0.66	15.5	7.7

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