

Effect of Fermentation Humidity on Quality of Congou Black Tea

Supplementary

Table S1. Effect of fermentation humidity on the chromatic aberration of congou black tea's infusion.

Samples	L*	a*	b*	b*/a*
RH55	84.18±0.44a	6.16±0.53a	68.4±1.3a	11.15±0.78a
RH65	84.12±0.35a	6.16±0.47a	68.24±1.28a	11.11±0.63a
RH75	84.29±0.55a	5.8±0.7a	67.13±1.57a	11.68±1.19a
RH85	84.19±0.62a	5.8±0.69a	66.71±2.85a	11.65±1.83a
RH95	84.1±0.64a	5.94±0.69a	67.26±1.79a	11.4±1.04a

Note: L*, the brightness of the infusion; a*, red-green tones, with positive values indicating the degree of redness; b*, yellow-blue tones, with positive values indicating the degree of yellow; b*/a*, the hue. Different lowercase letters in the same column indicate a significant difference at $p < 0.05$.

Table S2. Content of volatile compounds under different fermentation humidity conditions. ($\mu\text{g/g}$)

RT	RI	Compound Name	RH55	RH65	RH75	RH85	RH95
Alcohols							
4.30	863	3-Hexen-1-ol	6.07 \pm 0.23	6.05 \pm 0.25	6.56 \pm 0.64	7.67 \pm 1.91	7.74 \pm 0.81
8.09	1034	Benzyl alcohol	20.87 \pm 1.49	21.30 \pm 1.93	21.73 \pm 2.16	22.15 \pm 2.29	22.14 \pm 0.72
9.35	1073	cis-Furan linalool oxide	20.20 \pm 1.98	20.25 \pm 0.91	21.50 \pm 0.57	21.52 \pm 1.57	21.55 \pm 0.93
9.93	1089	trans-Furan linalool oxide	31.52 \pm 1.48	31.59 \pm 1.64	31.62 \pm 1.25	31.86 \pm 1.54	32.21 \pm 1.17
10.43	1102	Linalool	31.63 \pm 0.62b	31.87 \pm 1.59ab	32.26 \pm 1.00ab	32.76 \pm 1.79ab	34.37 \pm 1.94a
10.98	1115	Phenylethyl Alcohol	51.24 \pm 2.20	51.41 \pm 2.39	51.68 \pm 1.92	52.07 \pm 2.85	52.59 \pm 0.71
12.61	1152	Isopulegol	0.32 \pm 0.02	0.31 \pm 0.02	0.30 \pm 0.03	0.30 \pm 0.03	0.32 \pm 0.02
12.82	1156	cis-3-Nonen-1-ol	1.47 \pm 0.08	1.48 \pm 0.16	1.51 \pm 0.27	1.54 \pm 0.21	1.61 \pm 0.07
12.94	1158	(E,Z)-3,6-Nonadien-1-ol	1.32 \pm 0.04	1.28 \pm 0.15	1.30 \pm 0.15	1.26 \pm 0.13	1.31 \pm 0.03
13.24	1164	Myrtenol	0.46 \pm 0.02a	0.42 \pm 0.02b	0.40 \pm 0.03bc	0.40 \pm 0.01bc	0.37 \pm 0.02c
13.66	1173	trans-Pyranoid linalool oxide	16.73 \pm 1.01b	17.19 \pm 1.24ab	17.24 \pm 1.10ab	18.08 \pm 1.04ab	18.78 \pm 0.36a
13.94	1178	cis-Pyranoid linalool oxide	29.23 \pm 0.78	29.46 \pm 2.46	29.48 \pm 2.43	29.56 \pm 2.25	29.78 \pm 0.25
14.43	1187	2,6-Dimethyl-3,7-octadiene-2,6-diol	1.49 \pm 0.07	1.50 \pm 0.18	1.50 \pm 0.18	1.51 \pm 0.12	1.51 \pm 0.08
14.87	1195	dihydrocarveol	1.81 \pm 0.04	1.77 \pm 0.11	1.80 \pm 0.08	1.80 \pm 0.16	1.83 \pm 0.12
16.36	1224	Nerol	3.21 \pm 0.29b	3.34 \pm 0.32ab	3.55 \pm 0.14ab	3.57 \pm 0.32ab	3.77 \pm 0.24a
16.64	1229	Isogeraniol	1.94 \pm 0.11	1.95 \pm 0.15	2.00 \pm 0.18	2.04 \pm 0.33	2.06 \pm 0.10
17.96	1253	Geraniol	26.84 \pm 0.78	26.89 \pm 1.86	27.12 \pm 1.56	27.33 \pm 1.69	27.83 \pm 1.28
19.13	1273	2,6-Dimethyl-1,7-octadiene-3,6-diol	1.82 \pm 0.15	1.85 \pm 0.11	1.85 \pm 0.15	2.08 \pm 0.11	2.15 \pm 0.25

20.77	1299	Cumic alcohol	0.32±0.04c	0.44±0.04ab	0.49±0.05a	0.40±0.02b	0.39±0.01b
23.87	1361	8-Hydroxylinalool	0.81±0.08	0.83±0.09	0.84±0.08	1.02±0.14	0.95±0.13
33.82	1555	Nerolidol	4.71±0.25a	4.36±0.48ab	4.27±0.31ab	4.25±0.60ab	3.92±0.12b
35.62	1591	Alpha-Cedrol	0.94±0.05	0.96±0.05	1.15±0.12	1.00±0.10	1.02±0.05
36.50	1616	Widdrol	0.56±0.05	0.63±0.01	0.66±0.11	0.75±0.10	0.66±0.04
37.06	1636	Cadinol T	0.36±0.01c	0.37±0.02c	0.41±0.04bc	0.52±0.05a	0.42±0.01b
37.45	1649	alpha-Cadinol	0.82±0.02	0.87±0.08	0.93±0.11	0.80±0.08	0.64±0.48
39.85	1750	cis-Lanceol	0.04±0.00b	0.05±0.00a	0.04±0.00b	0.05±0.01a	0.05±0.01a
44.58	2108	Phytol	0.50±0.01a	0.47±0.05ab	0.37±0.04c	0.30±0.03d	0.41±0.03bc
Alkanes & Alkenes							
8.00	1031	Limonene	10.33±0.80b	10.40±1.00b	13.97±1.56a	12.37±1.61ab	12.27±0.75ab
15.20	1201	Dodecane	0.38±0.04b	0.38±0.01b	0.43±0.02b	0.49±0.05a	0.50±0.04a
20.93	1302	1-Methylnaphthalene	0.13±0.02ab	0.12±0.01bc	0.15±0.02a	0.10±0.01c	0.11±0.02bc
25.97	1398	Tetradecane	0.36±0.02	0.35±0.02	0.37±0.06	0.40±0.07	0.41±0.01
29.15	1461	Alloaromadendrene	0.03±0.00c	0.04±0.00bc	0.05±0.01a	0.04±0.01b	0.04±0.00bc
31.08	1496	α-Farnesene	0.61±0.06c	0.85±0.03bc	1.01±0.17b	1.56±0.08a	1.59±0.23a
31.60	1505	δ-Cadinene	0.81±0.06b	0.83±0.06b	0.97±0.06a	0.82±0.01b	0.75±0.04b
Esters							
14.64	1191	Methylsalicylate	12.25±0.88	12.32±0.92	12.82±0.90	12.91±0.99	12.92±0.80
16.58	1228	Linalylformate	1.28±0.03	1.28±0.05	1.27±0.13	1.28±0.13	1.30±0.09
17.11	1238	cis-3-Hexenyl3-methylbutanoate	2.97±0.16	2.95±0.18	2.96±0.14	3.12±0.29	3.20±0.45

19.43	1278	1,5-Octalactone	1.88±0.05	1.96±0.17	1.99±0.14	2.04±0.08	2.38±0.35
19.81	1284	Isopulegylacetate	0.24±0.03a	0.21±0.02a	0.21±0.04a	0.15±0.02b	0.20±0.02a
23.65	1356	Gamma-Nonalactone	0.76±0.11	0.77±0.11	0.79±0.05	0.90±0.07	0.85±0.12
24.06	1364	Butoxyethoxyethylacetate	2.74±0.17	2.83±0.15	3.16±0.23	3.06±0.30	2.90±0.15
24.91	1380	cis-3-Hexenylhexanoate	6.73±0.29	6.46±0.26	6.22±0.93	6.17±0.75	5.75±0.40
25.09	1383	cis-3-Hexenylcis-3-hexenoate	1.33±0.14a	0.96±0.11b	0.90±0.06b	1.03±0.16b	0.93±0.11b
25.19	1385	Hexylhexanoate	2.76±0.08	2.79±0.14	2.86±0.26	3.03±0.28	2.73±0.18
25.37	1388	trans-2-Hexenylhexanoate	5.45±0.20a	4.51±0.27b	4.49±0.29b	4.48±0.54b	4.27±0.30b
27.05	1420	Coumarin	0.80±0.09	0.82±0.04	0.86±0.04	0.92±0.07	0.92±0.09
27.58	1431	Phenethylbutyrate	0.50±0.02c	0.51±0.03c	0.52±0.02bc	0.55±0.02b	0.64±0.02a
29.98	1476	Jasminelactone	1.41±0.13	1.40±0.07	1.37±0.11	1.39±0.16	1.43±0.09
30.16	1480	δ-Amylvalerolactone	0.39±0.01c	0.45±0.03ab	0.42±0.04bc	0.38±0.02c	0.48±0.00a
31.71	1509	Dihydroactinidiolide	1.37±0.06	1.38±0.07	1.42±0.14	1.45±0.12	1.57±0.06
32.98	1537	BenzylHexanoate	0.32±0.01a	0.23±0.01b	0.25±0.04b	0.24±0.02b	0.24±0.01b
34.16	1562	cis-3-Hexenylbenzoate	1.96±0.16	1.94±0.15	2.02±0.22	1.93±0.24	1.98±0.05
34.57	1570	Hexylbenzoate	0.32±0.02	0.32±0.05	0.36±0.03	0.33±0.02	0.35±0.02
34.95	1578	trans-2-Hexenylbenzoate	0.58±0.03	0.60±0.05	0.66±0.07	0.60±0.06	0.61±0.03
35.50	1589	Caryophylleneoxide	0.30±0.04	0.30±0.01	0.31±0.06	0.29±0.02	0.32±0.02
39.31	1720	Methylmyristate	0.18±0.02	0.18±0.01	0.18±0.01	0.18±0.02	0.17±0.02
41.52	1854	Diisobutylphthalate	0.34±0.01	0.36±0.02	0.40±0.05	0.38±0.01	0.40±0.03
42.45	1924	Methylhexadecanoate	2.05±0.07	2.06±0.17	2.01±0.11	2.00±0.04	2.01±0.12

42.79	1952	Dibutylphthalate	0.09±0.01	0.10±0.02	0.10±0.02	0.10±0.01	0.12±0.02
44.46	2098	Methyloleate	0.19±0.01	0.18±0.03	0.18±0.01	0.18±0.03	0.19±0.01
Aldehydes & Ketones							
4.16	854	(E)-2-Hexenal	11.70±0.11	11.93±0.77	12.26±0.43	12.53±2.17	13.17±1.27
6.04	956	(E)-2-Heptenal	0.15±0.01	0.14±0.02	0.17±0.02	0.17±0.01	0.17±0.01
6.21	963	Benzaldehyde	3.79±0.24	3.84±0.16	4.08±0.26	4.18±0.61	4.41±0.31
7.43	1012	(E,E)-2,4-Heptadienal	1.05±0.05b	1.07±0.03b	1.30±0.11a	1.34±0.19a	1.39±0.16a
8.43	1045	Phenylacetaldehyde	28.51±1.02	28.41±1.45	28.66±2.67	29.21±3.66	31.87±1.06
8.88	1059	(E)-2-Octenal	1.26±0.11b	1.29±0.21b	1.88±0.14a	1.82±0.03a	1.67±0.20a
9.22	1069	Furaneol	2.95±0.06a	2.93±0.15a	2.86±0.23a	2.26±0.33b	1.62±0.23c
13.13	1162	(E)-2-Nonenal	0.78±0.05	0.76±0.09	0.82±0.09	0.82±0.03	0.88±0.05
15.00	1197	Safranal	1.83±0.11	1.71±0.14	1.71±0.23	1.63±0.15	1.65±0.19
15.44	1206	Decanal	1.06±0.14	1.06±0.15	1.07±0.14	1.09±0.10	1.11±0.16
15.85	1214	(E,E)-2,4-Nonadienal	0.60±0.02c	0.83±0.02bc	1.05±0.17ab	1.07±0.20ab	1.09±0.19a
16.05	1218	β-Cyclocitral	7.92±0.18b	8.02±0.21b	8.54±0.56b	8.59±0.58ab	9.40±0.58a
18.06	1255	2,6,6-Trimethyl-1-cyclohexene-1-acetaldehyde	2.55±0.09	2.53±0.22	2.54±0.27	2.55±0.03	2.53±0.20
18.58	1264	trans-2-Decenal	0.95±0.10	0.96±0.14	0.98±0.15	0.99±0.13	1.13±0.09
18.77	1267	α-Ethylidenbenzeneacetaldehyde	6.98±0.19a	5.69±0.21bc	5.88±0.27bc	5.91±0.18b	5.54±0.14c
18.86	1269	Citral	1.37±0.12c	1.31±0.08c	1.35±0.05c	1.53±0.04b	1.70±0.09a
20.57	1296	Perillaldehyde	0.23±0.02	0.25±0.01	0.25±0.02	0.24±0.02	0.26±0.02
21.65	1317	(E,E)-2,4-Decanedienal	1.59±0.18	1.53±0.22	1.49±0.11	1.33±0.08	1.33±0.12

24.63	1374	Damascenone	1.68±0.14	1.75±0.06	1.87±0.09	1.76±0.14	1.67±0.08
25.32	1387	Jasmone	1.56±0.08bc	1.44±0.10c	1.89±0.23a	1.88±0.11a	1.81±0.15ab
26.70	1413	Alpha-Ionone	1.39±0.09	1.42±0.17	1.51±0.10	1.60±0.19	1.69±0.19
28.07	1440	Nerylacetone	1.06±0.08	1.05±0.14	1.02±0.15	0.99±0.14	0.98±0.16
29.53	1468	β-Ionone	9.40±0.09	8.51±0.99	8.48±1.12	8.34±0.81	8.44±0.72
29.69	1471	β-Ionone-5,6-epoxide	1.61±0.19b	1.67±0.12b	1.83±0.14ab	1.85±0.10ab	1.98±0.07a
29.84	1474	5-Methyl-2-phenylhex-2-enal	1.49±0.06	1.51±0.19	1.51±0.14	1.50±0.13	1.52±0.14
Acids							
6.87	991	Hexanoic acid	2.47±0.30c	2.68±0.45c	2.79±0.96c	3.84±0.28b	4.90±0.49a
7.38	1010	(E)-3-hexenoic acid	10.33±1.19	10.41±0.35	10.52±0.70	10.95±0.67	11.84±0.86
9.70	1082	Heptanoic acid	0.77±0.12	0.79±0.03	0.93±0.15	0.87±0.05	0.84±0.12
19.04	1272	Nonoic acid	2.49±0.04c	2.44±0.12c	2.31±0.14c	2.88±0.30b	3.39±0.19a
23.39	1351	Geranic acid	1.48±0.09	1.40±0.21	1.39±0.13	1.37±0.19	1.36±0.25
Phenols							
20.14	1289	Thymol	1.07±0.05	1.06±0.02	1.08±0.04	1.07±0.02	1.08±0.06
23.26	1349	Eugenol	2.88±0.27ab	3.11±0.07a	2.59±0.21bc	2.42±0.18c	2.67±0.11bc
30.88	1492	Butylated Hydroxytoluene	0.26±0.02b	0.22±0.03b	0.15±0.02c	0.36±0.01a	0.37±0.00a
31.18	1498	2,4-Di-t-Butylphenol	0.97±0.07a	0.96±0.05a	0.69±0.03b	0.67±0.05b	0.72±0.03b
Others							
9.14	1067	2-Acetylpyrrole	nd	nd	1.84±0.17a	1.43±0.10b	1.45±0.08b
20.07	1288	Indole	1.25±0.05a	1.21±0.02a	1.10±0.03b	1.07±0.02b	1.08±0.00b

21.11	1306	Edulane	nd	nd	0.99±0.07a	0.82±0.01b	0.89±0.05b
21.32	1310	2,6,10,10-Tetramethyl-1-oxaspiro[4.5]dec-6-ene	0.40±0.02c	0.66±0.03a	0.53±0.05b	0.39±0.04c	0.40±0.01c

Note: nd indicates that the substance was not detected in the samples; different small letters in the same row indicate significant difference at $p < 0.05$.