

## Supplementary Materials

Table S1 Peak area of volatile compounds ( $\times 10^6$ ) in two rice samples during rice cooking process

No.	Compounds	Chunjiangnuo				Fuxiangnuo				RI <sub>cal</sub> <sup>a</sup>	RI <sub>ref</sub> <sup>b</sup>	Odor description <sup>c</sup>
		RR	WR	PR	CR	RR	WR	PR	CR			
1	(Z)-5-Octen-1-ol	0.25±0.01 <sup>b</sup>	0.28±0.02 <sup>b</sup>	0.36±0.03 <sup>b</sup>	1.08±0.28 <sup>a</sup>	0.22±0.02 <sup>b</sup>	0.24±0.01 <sup>b</sup>	0.27±0.09 <sup>b</sup>	1.12±0.31 <sup>a</sup>	1287	1287	fat, soap, lemon, green
2	1-Octen-3-ol	0.84±0.05 <sup>b</sup>	0.96±0.10 <sup>b</sup>	1.12±0.14 <sup>ab</sup>	1.32±0.30 <sup>a</sup>	0.65±0.01 <sup>b</sup>	0.81±0.03 <sup>ab</sup>	0.93±0.27 <sup>ab</sup>	1.10±0.31 <sup>a</sup>	1455	1455	mushroom
	Alcohols	1.09±0.06	1.24±0.11	1.47±0.17	2.40±0.57	0.87±0.01	1.05±0.04	1.20±0.35	2.22±0.61			
3	Pentanal	0.07±0.01 <sup>b</sup>	0.04±0.04 <sup>b</sup>	0.07±0.01 <sup>b</sup>	0.18±0.05 <sup>a</sup>	ND	0.05±0.01 <sup>b</sup>	ND	0.16±0.04 <sup>a</sup>	972	972	almond, malt, pungent
4	Hexanal	3.27±0.06 <sup>b</sup>	3.19±0.20 <sup>b</sup>	4.28±0.64 <sup>b</sup>	9.32±1.71 <sup>a</sup>	2.84±0.18 <sup>b</sup>	2.84±0.2 <sup>b</sup>	3.58±0.86 <sup>b</sup>	7.91±1.99 <sup>a</sup>	1078	1078	grass, tallow, fat
5	Heptanal	0.15±0.13 <sup>b</sup>	0.15±0.13 <sup>b</sup>	0.44±0.09 <sup>a</sup>	0.46±0.12 <sup>a</sup>	0.17±0.15 <sup>b</sup>	0.27±0.02 <sup>ab</sup>	0.51±0.20 <sup>a</sup>	0.44±0.11 <sup>a</sup>	1182	1182	fat, citrus, rancid
6	<i>trans</i> -2-Heptenal	0.49±0.02 <sup>b</sup>	0.52±0.01 <sup>ab</sup>	0.63±0.09 <sup>a</sup>	0.58±0.11 <sup>ab</sup>	0.31±0.03 <sup>a</sup>	0.35±0.02 <sup>a</sup>	0.48±0.20 <sup>a</sup>	0.45±0.11 <sup>a</sup>	1318	1318	green, soap, fat, almond

7	Nonanal	2.26±0.11 <sup>c</sup>	7.48±0.62 <sup>a</sup>	8.11±0.43 <sup>a</sup>	3.45±0.83 <sup>b</sup>	2.82±0.36 <sup>c</sup>	7.68±0.98 <sup>ab</sup>	8.83±2.69 <sup>a</sup>	4.89±1.13 <sup>bc</sup>	1391	1391	fat, citrus, green
8	<i>trans</i> -2-octenal	1.80±0.10 <sup>a</sup>	1.66±0.16 <sup>a</sup>	2.17±0.44 <sup>a</sup>	1.76±0.31 <sup>a</sup>	1.06±0.08 <sup>a</sup>	1.02±0.09 <sup>a</sup>	1.47±0.30 <sup>a</sup>	1.46±0.37 <sup>a</sup>	1425	1425	green, nut, fat
9	Decanal	1.20±0.22 <sup>c</sup>	1.64±0.01 <sup>a</sup>	1.53±0.03 <sup>ab</sup>	1.25±0.23 <sup>bc</sup>	0.42±0.37 <sup>b</sup>	1.31±0.22 <sup>a</sup>	1.37±0.36 <sup>a</sup>	1.06±0.23 <sup>a</sup>	1497	1497	soap, orange peel, tallow
10	<i>trans</i> -2-Nonenal	1.29±0.18 <sup>c</sup>	1.86±0.14 <sup>b</sup>	2.69±0.27 <sup>a</sup>	0.55±0.05 <sup>d</sup>	1.35±0.33 <sup>bc</sup>	1.91±0.46 <sup>ab</sup>	2.62±0.53 <sup>a</sup>	0.68±0.16 <sup>c</sup>	1531	1531	cucumber, fat, green
11	( <i>E</i> )-2-Decenal	0.49±0.17 <sup>a</sup>	0.42±0.14 <sup>a</sup>	0.17±0.30 <sup>a</sup>	0.30±0.05 <sup>a</sup>	0.20±0.17 <sup>a</sup>	ND	0.23±0.21 <sup>a</sup>	0.42±0.11 <sup>a</sup>	1640	1640	tallow
12	2-Butyl-2-octenal	6.25±0.84 <sup>a</sup>	2.30±0.46 <sup>b</sup>	2.51±0.49 <sup>b</sup>	6.47±0.65 <sup>a</sup>	3.53±0.25 <sup>a</sup>	1.81±0.54 <sup>b</sup>	1.63±0.07 <sup>b</sup>	3.24±0.45 <sup>a</sup>	1666	1666	green
13	( <i>E,E</i> )-2,4-Nonadienal	0.39±0.14 <sup>a</sup>	0.28±0.25 <sup>a</sup>	0.56±0.05 <sup>a</sup>	0.31±0.10 <sup>a</sup>	0.31±0.04 <sup>a</sup>	0.45±0.21 <sup>a</sup>	0.35±0.04 <sup>a</sup>	0.25±0.11 <sup>a</sup>	1696	1696	fat, wax, green
14	2-Undecenal	0.36±0.10 <sup>ab</sup>	0.25±0.22 <sup>ab</sup>	0.42±0.15 <sup>a</sup>	0.12±0.11 <sup>b</sup>	0.25±0.03 <sup>a</sup>	0.23±0.10 <sup>a</sup>	0.28±0.07 <sup>a</sup>	0.21±0.05 <sup>a</sup>	1749	1749	sweet
15	( <i>E,E</i> )-2,4-Decadienal	0.24±0.24 <sup>a</sup>	0.31±0.09 <sup>a</sup>	0.34±0.09 <sup>a</sup>	0.19±0.06 <sup>a</sup>	ND	0.06±0.11 <sup>a</sup>	ND	0.17±0.05 <sup>a</sup>	1805	1805	fried, wax, fat
16	Vanillin	0.08±0.04 <sup>ab</sup>	0.05±0.02 <sup>b</sup>	0.04±0.01 <sup>b</sup>	0.11±0.0 <sup>a</sup>	0.08±0.03 <sup>ab</sup>	0.05±0.02 <sup>bc</sup>	0.03±0.01 <sup>c</sup>	0.11±0.02 <sup>a</sup>	2554	2554	vanilla
	Aldehydes	18.33±1.61	20.16±1.21	23.96±2.47	25.06±3.94	13.33±0.45	18.03±1.83	21.39±4.97	21.44±4.78			

17	6-Methyltridecane	ND	ND	ND	0.42±0.26	ND	ND	ND	0.99±0.06	1300	1300	
18	3-Methyltridecane	0.69±0.25 <sup>a</sup>	0.35±0.14 <sup>bc</sup>	0.53±0.22 <sup>ab</sup>	0.13±0.00 <sup>c</sup>	0.79±0.25 <sup>a</sup>	0.41±0.07 <sup>ab</sup>	0.59±0.19 <sup>ab</sup>	0.24±0.04 <sup>b</sup>	1368	1368	
19	Tetradecane	1.36±0.88 <sup>a</sup>	1.14±0.68 <sup>a</sup>	1.23±0.77 <sup>a</sup>	0.68±0.36 <sup>a</sup>	1.29±0.94 <sup>a</sup>	1.18±0.27 <sup>a</sup>	1.33±0.67 <sup>a</sup>	0.74±0.29 <sup>a</sup>	1400	1400	
20	Hexadecane	1.70±0.65 <sup>a</sup>	1.64±0.27 <sup>a</sup>	1.75±0.52 <sup>a</sup>	1.05±0.34 <sup>a</sup>	1.33±0.49 <sup>ab</sup>	1.68±0.34 <sup>a</sup>	1.88±0.36 <sup>a</sup>	0.62±0.10 <sup>b</sup>	1600	1600	alkane
	Alkanes	3.75±1.75	3.13±1.01	3.52±1.47	2.28±0.17	3.41±1.69	3.27±0.26	3.80±0.85	2.59±0.18			
21	Styrene	1.03±0.41 <sup>a</sup>	0.29±0.09 <sup>b</sup>	0.39±0.06 <sup>b</sup>	0.15±0.04 <sup>b</sup>	1.44±0.40 <sup>a</sup>	0.35±0.07 <sup>b</sup>	0.40±0.09 <sup>b</sup>	0.18±0.09 <sup>b</sup>	1251	1251	balsamic, gasoline
22	Naphthalene	0.88±0.12 <sup>b</sup>	0.88±0.05 <sup>b</sup>	1.05±0.06 <sup>a</sup>	0.55±0.07 <sup>c</sup>	0.92±0.07 <sup>a</sup>	0.97±0.16 <sup>a</sup>	0.98±0.06 <sup>a</sup>	0.54±0.09 <sup>b</sup>	1730	1730	tar
23	<i>trans</i> -Calamenene	0.13±0.02 <sup>b</sup>	0.13±0.02 <sup>b</sup>	0.11±0.07 <sup>b</sup>	0.15±0.01 <sup>b</sup>	0.09±0.01 <sup>a</sup>	0.12±0.04 <sup>a</sup>	0.09±0.03 <sup>a</sup>	0.11±0.02 <sup>a</sup>	1828	1828	herb, spice
	2-											floral
24	Methylnaphthalene	0.47±0.14 <sup>a</sup>	0.16±0.14 <sup>b</sup>	0.32±0.20 <sup>ab</sup>	0.17±0.01 <sup>b</sup>	0.50±0.16 <sup>a</sup>	0.48±0.38 <sup>a</sup>	0.34±0.25 <sup>a</sup>	0.19±0.01 <sup>a</sup>	1877	1877	sweet floral woody
25	Fluorene	0.05±0.04 <sup>a</sup>	0.06±0.01 <sup>a</sup>	0.03±0.02 <sup>a</sup>	0.03±0.01 <sup>a</sup>	0.05±0.04 <sup>a</sup>	0.05±0.01 <sup>a</sup>	0.02±0.02 <sup>a</sup>	0.03±0.00 <sup>a</sup>	2324	2324	
26	Benzophenone	0.06±0.01 <sup>a</sup>	0.02±0.02 <sup>b</sup>	0.03±0.01 <sup>b</sup>	ND	0.05±0.00 <sup>a</sup>	0.02±0.01 <sup>b</sup>	0.02±0.02 <sup>b</sup>	ND	2469	2469	

27	Dibutyl phthalate	0.86±0.84 <sup>a</sup>	0.27±0.12 <sup>a</sup>	0.19±0.07 <sup>a</sup>	0.14±0.02 <sup>a</sup>	0.53±0.32 <sup>a</sup>	0.30±0.28 <sup>a</sup>	0.28±0.32 <sup>a</sup>	0.09±0.02 <sup>a</sup>	2675	2675	
	Aromatics	3.48±1.35	1.80±0.14	2.11±0.40	1.19±0.11	3.57±0.90	2.30±0.76	2.15±0.67	1.14±0.22			
28	Acetic acid, methyl ester	0.22±0.05 <sup>a</sup>	0.02±0.03 <sup>b</sup>	0.02±0.03 <sup>b</sup>	0.03±0.03 <sup>b</sup>	0.35±0.02 <sup>a</sup>	ND	0.03±0.05 <sup>b</sup>	ND	835	835	ethereal
29	Ethyl Acetate	1.06±0.15 <sup>a</sup>	0.18±0.03 <sup>b</sup>	0.14±0.06 <sup>b</sup>	0.14±0.03 <sup>b</sup>	2.01±0.23 <sup>a</sup>	0.20±0.02 <sup>b</sup>	0.23±0.06 <sup>b</sup>	0.05±0.04 <sup>b</sup>	888	888	pineapple
30	Methyl tetradecanoate	0.32±0.14 <sup>a</sup>	0.04±0.07 <sup>b</sup>	ND	0.32±0.11 <sup>a</sup>	0.87±0.18 <sup>a</sup>	0.16±0.06 <sup>b</sup>	0.05±0.08 <sup>b</sup>	0.55±0.15 <sup>a</sup>	2000	2000	orris
	(Z)-9-Octadecenoic acid, methyl ester	0.54±0.30 <sup>ab</sup>	0.05±0.09 <sup>b</sup>	ND	1.23±0.99 <sup>a</sup>	0.87±0.63 <sup>a</sup>	ND	ND	0.53±0.53 <sup>a</sup>	2447	2447	mild fatty
	Esters	2.14±0.50	0.29±0.10	0.16±0.09	1.72±1.15	4.10±0.58	0.36±0.07	0.31±0.12	1.13±0.65			
32	2-Ethylfuran	ND	ND	ND	0.12±0.04	ND	ND	ND	0.08±0.02	946	946	chemical
33	2-Propylfuran	ND	ND	ND	0.07±0.06	ND	ND	ND	0.02±0.03	1029	1029	
34	2-n-Butylfuran	0.15±0.02 <sup>b</sup>	0.07±0.06 <sup>b</sup>	0.10±0.09 <sup>b</sup>	0.73±0.20 <sup>a</sup>	0.09±0.08 <sup>b</sup>	ND	ND	0.51±0.1 <sup>a</sup>	1133	1133	spicy
35	2-Pentylfuran,	3.02±0.20 <sup>b</sup>	2.30±0.06 <sup>b</sup>	2.40±0.43 <sup>b</sup>	16.10±4.68 <sup>a</sup>	2.16±0.14 <sup>b</sup>	1.66±0.31 <sup>b</sup>	1.87±0.53 <sup>b</sup>	12.82±2.68 <sup>a</sup>	1231	1231	green bean, butter

36	2-n-Heptylfuran	ND	ND	ND	0.09±0.08	ND	ND	ND	0.05±0.09	1432	1432	green
	Furans	3.17±0.22	2.37±0.05	2.50±0.52	17.11±5.04	2.25±0.16	1.66±0.31	1.87±0.53	13.47±2.88			
37	2-Heptanone	0.28±0.02 <sup>b</sup>	0.13±0.11 <sup>b</sup>	0.20±0.04 <sup>b</sup>	0.62±0.14 <sup>a</sup>	0.33±0.21 <sup>ab</sup>	0.11±0.09 <sup>b</sup>	0.13±0.11 <sup>ab</sup>	0.51±0.13 <sup>a</sup>	1180	1180	soap
38	2-Octanone	0.69±0.12 <sup>b</sup>	0.64±0.17 <sup>b</sup>	1.34±0.27 <sup>a</sup>	0.19±0.05 <sup>c</sup>	0.80±0.25 <sup>b</sup>	0.93±0.08 <sup>b</sup>	1.85±0.33 <sup>a</sup>	0.22±0.05 <sup>c</sup>	1283	1283	soap, gasoline
39	6-Methyl-5-hepten-2-one	ND	ND	ND	0.17±0.04	ND	ND	ND	0.13±0.03	1336	1336	pepper, mushroom, rubber
40	2-Nonanone	ND	ND	ND	0.26±0.07	ND	ND	ND	0.25±0.05	1387	1387	hot milk, soap, green fruity berry
41	3-Nonen-2-one	0.46±0.07 <sup>a</sup>	0.33±0.08 <sup>a</sup>	0.44±0.21 <sup>a</sup>	0.46±0.13 <sup>a</sup>	0.24±0.08 <sup>a</sup>	0.16±0.15 <sup>a</sup>	0.24±0.08 <sup>a</sup>	0.21±0.05 <sup>a</sup>	1509	1509	fatty oily ketonic weedy spicy licorice
42	6-Undecanone	ND	ND	ND	0.54±0.07	ND	ND	ND	0.35±0.09	1526	1526	orange, fresh, green
43	Geranylacetone	1.11±0.21 <sup>a</sup>	1.05±0.10 <sup>a</sup>	1.22±0.19 <sup>a</sup>	1.15±0.14 <sup>a</sup>	0.88±0.10 <sup>a</sup>	1.00±0.25 <sup>a</sup>	1.02±0.05 <sup>a</sup>	0.63±0.13 <sup>a</sup>	1853	1853	magnolia, green

44	2-Pentadecanone	0.09±0.16 <sup>a</sup>	ND	0.08±0.14 <sup>a</sup>	0.19±0.02 <sup>a</sup>	ND	0.38±0.06 <sup>a</sup>	0.22±0.20 <sup>ab</sup>	0.21±0.04 <sup>ab</sup>	2009	2009	
	Ketones	2.63±0.47	2.15±0.23	3.28±0.68	3.59±0.64	2.25±0.62	2.58±0.34	3.46±0.33	2.50±0.53			
45	Methylene chloride	0.18±0.07	ND	ND	ND	0.15±0.03 <sup>a</sup>	0.01±0.01 <sup>a</sup>	ND	ND	925	925	
46	2-Pentylthiophene	ND	ND	ND	0.64±0.10	ND	ND	ND	0.16±0.28	1454	1454	sweet, fruit
47	Isophorone	ND	ND	ND	ND	0.29±0.50 <sup>b</sup>	0.58±0.50 <sup>ab</sup>	0.62±0.54 <sup>ab</sup>	1.44±0.36 <sup>a</sup>	1586	1586	
48	Cedrol	2.84±0.61 <sup>a</sup>	1.52±0.91 <sup>ab</sup>	1.34±1.08 <sup>b</sup>	0.18±0.16 <sup>b</sup>	2.81±0.69 <sup>a</sup>	1.23±0.89 <sup>ab</sup>	1.74±1.81 <sup>ab</sup>	0.16±0.14 <sup>b</sup>	2109	2109	
49	Indole	0.34±0.08 <sup>b</sup>	0.38±0.03 <sup>ab</sup>	0.37±0.03 <sup>b</sup>	1.08±0.74 <sup>a</sup>	2.40±0.44 <sup>a</sup>	2.13±0.44 <sup>a</sup>	2.17±0.34 <sup>a</sup>	4.11±2.09 <sup>a</sup>	2436	2436	mothball, burnt
	Others	3.36±0.63	1.90±0.88	1.71±1.09	1.90±0.92	5.65±0.97	3.94±0.29	4.52±1.03	5.87±2.53	1287	1287	

ND: not detected.

Means with the same superscript letter were not significantly different ( $p < 0.05$ ).

a: calculated retention index were determined using n-alkanes C6 to C24 as external standards on a DB-Wax column.

b: RI<sub>ref</sub> were obtained from <https://webbook.nist.gov/>.

c: odor description were obtained from <https://www.flavornet.org/> and <http://www.thegoodscentscompany.com/>.

RR: raw rice; WR: washed rice; PR: presoaked rice; CR: cooked rice; ND: not detected.