Table S1 Chemical sensors used in electronic nose corresponding to different types of volatile substances

Sensor array	Sensor name	Sensor sensitives
S1	W1C	Aromatic organic compounds
S2	W5S	High sensitivity and sensitive with nitrogen oxides
S3	W3C	Ammonia, a sensor for aromatic compounds
S4	W6S	Mainly selective for hydrogen
S5	W5C	Alkanes, aromatic compounds, and nonpolar organic compounds
S6	W1S	Sensitive to methane. Broad range of organic compounds detected
S7	W1W	Sensitive to sulfides, for example, H_2S, sensitive to organic components of hydrocarbon and sulphur
S8	W2S	Detection of alcohol, partially sensitive to aromatic compounds, wide range
S9	W2W	Aromatic compounds, sensitive to organic sulfides
S10	W3S	Sensitive to alkanes, for example, high concentrations (>100 mg/kg) of methane and aliphatic organic compounds

Table S2 Standard solution for electronic tongue analysis

Solution	Ingredient
Reference solution	2.2365g NaCl, 0.0450g tartaric acid
Anionic solution	300 mL ethyl alcohol, 8.3 mL HCl
Cationic solution	7.46 g KCl, 0.56 g KOH, 300 mL ethyl alcohol
Saltiness standard solution	22.365 g KCl, 0.0450 g tartaric acid
Sourness standard solution	2.2365 g KCl, 0.0450 g tartaric acid
Umami	2.2365 g KCl, 0.0450 g tartaric acid, 1.691 g sodium glutamate
Bitterness standard solution 1	2.2365g KCl, 0.0450g tartaric acid, 0.0361 g quinine hydrochloride
Bitterness standard solution 2	2.2365g KCl, 0.0450g tartaric acid, 0.1 mL iso-α-acid
Astringency standard solution	2.2365 g KCl, 0.0450 g tartaric acid, 0.5 g tannin

Table S3 Sensory scoring rules for the SCG fermented beverages

Items and weight	Characteristics	Score
Color and lustre (20 points)	Clear, transparent, glossy, pleasing, and harmonious	20-19
	Clear, transparent, and glossy	17-18
	Clear, no impurities, and no luster	14-16
	Slight turbidity and light loss	<13
Aroma (30 points)	A typical coffee aroma, wine is fragrant and harmonious	27-30
	Good and relative harmonious coffee and wine aromas	23-26
	A light coffee aroma and a weak wine aroma	19-22
	Insufficient, unpleasant, or slight peculiar aromas	15-18
	Bad and disgusting aromas	<14
Taste (40 points)	Full-bodied, mellow, and refreshing wine with a harmonious sour, sweet, and bitter taste and a long aftertaste	37-40
	Soft and refreshing wine with an appropriate sour, sweet, and bitter taste	33-36
	A harmonious and pure wine taste	26-32
	Too sour/bitter/sweet, greasy, and less-rich wine tastes	19-25
	A bland sour, astringent, and bitter taste and a peculiar taste	<18
Style (10 points)	Perfect typicality of coffee wine and unique and elegant characteristics	10
	Obvious typicality of coffee wine and a good style	8-9
	A certain typicality of coffee wine but not elegant enough	6-7
	Without typicality of coffee wine	<5

Table S4 Performance of different yeast strains in SCG extract

Yeast strains	CO_2 production[a]	Ethanol (% vol)[b]	Sensory score[b]	Aroma description[b]
S. cerevisiae D254	+++	6.9 ± 0.2^{B}	75 ± 3.8^{A}	A typical coffee aroma with plump and harmonious wine
S. bayanus BV818	++	6.6 ± 0.1^{B}	66 ± 4.2^{BC}	A relative light coffee aroma with monotonous wine
S. bayanus DV10	++	5.5 ± 0.1^{C}	72 ± 3.2^{AB}	A typical coffee aroma with relative monotonous wine
S. bayanus EC1118	+++	7.5 ± 0.1^{A}	62 ± 1.8^{C}	A light coffee aroma with monotonous wine

Values with different superscript capital letters in the same column are significantly different according to the one-way ANOVA and HSD tests.

[a] CO_2 production was assayed in the Durham tube fermentation. 0.4 mL activated commercial yeast strains were inoculated in 10 mL 13°Brix SCG extract at 28°C for 12 h. + means that the Durham tube was filled with 1/4 volume of gas, ++ means that the Durham tube was filled with 1/2 volume of gas, +++ means that the Durham tube was filled with 3/4 volume of gas, ++++ means that the Durham tube was almost full of gas.

[b]4% activated commercial yeast strains were added to SCG extract, which was mixed with 20% sucrose and pH was adjusted to 4.0 by citric acid. The main fermentation was conducted at 25 ℃ for 9 days. The fermentations were conducted three times.

Table S5 Chemical parameters of unfermented SCG extract

Category	Compounds			
Sugars (g/L)[a]	Fructose 3.59 ± 0.08			
	Glucose 3.94 ± 0.25			
	Sucrose 240.85 ± 12.6			
	Arabinose 2.03 ± 0.11			
Organic acids (g/L)[b]	Oxalic acid 2.62 ± 0.02			
	L-Malic acid 1.05 ± 0.07			
	Lactic acid 1.39 ± 0.01			
	Acetic acid 0.08 ± 0.00			
	Citric acid 2.51 ± 0.01			
Free amino acids (mg/L)[c]	Asp 13.41 ± 0.07	Gly 5.06 ± 0.37	Cys 11.01 ± 0.07	Ile /
	Glu /	Thr /	Val 2.35 ± 0.07	Leu 2.82 ± 0.30
	Asn 31.73 ± 1.03	Cit /	Met /	Lys /
	Ser 0.94 ± 1.33	Arg /	Nva 3.24 ± 0.44	Hyp 78.12 ± 8.34
	Gln /	Ala 14.66 ± 3.62	Trp 12.47 ± 0.37	Sar 12.94 ± 0.15
	His /	Tyr /	Phe 6.89 ± 0.15	Pro 12.47 ± 1.25
Inorganic ions (mg/L)[d]	K 10.36 ± 0.37			
	Mg 1.92 ± 0.06			
	P 2.36 ± 0.01			
	S 1.63 ± 0.10			

/ Not detected

[a] Samples were mixed with 219 g/L zinc acetate solution and 106 g/L potassium ferrocyanide solution at a ratio of 10:1:1. After centrifuging at 9000 r/min at 4 °C for 15 min, the supernatants

were filtered through a 0.22 μm filter membrane (Millipore, Billerica, MA, USA). Sugars were analyzed using high-performance liquid chromatography (HPLC, Waters ACQUITY UPLC, Mass, USA) with a refractive index detector and a Luna ® 5μm NH_2 100Å LC column (250*4.6 mm, phenomenex, CA, USA) at 40 °C. Acetonitrile and deionized water (volume ratio 70:30) were used as the mobile phase at a flow rate of 1.0 mL/min. The detection wavelength was 210 nm. Sugars were quantified by external standards.

[b] Samples were mixed with 92 g/L zinc acetate solution and 183 g/L potassium ferrocyanide solution at a ratio of 1:1:1. After centrifuging at 9000 r/min at 4 °C for 15 min, the supernatants were filtered through a 0.22 μm filter membrane. Organic acids were analyzed using HPLC (Agilent 1260, Agilent, CA, USA) with a DAD detector and a ZORBAX-SB-Aq column (250*4.6 mm, Agilent, CA, USA) at 30 °C. Perchloric acid aqueous solution (perchloric acid aqueous: deionized water =4:10000, pH2.5) and methanol (volume ratio 98:2) were used as the mobile phase at a flow rate of 0.6 mL/min. The detection wavelength was 210 nm. Organic acids were quantified by external standards.

[c] 1.0 g samples were mixed with 5 mL 0.01M HCl in boiling water bath for 30 min. After centrifuging at 10000 r/min at 4 °C for 10 min, the supernatants were mixed with 2 mL 0.01M HCl with ultrasonic treatment for 5 min. The collected supernatants were filtered through a 0.22 μm filter membrane. The amino acids were derivatized using an automatic on-line derivatization method of Agilent. The primary and secondary amino acids were reacted with phthalaldehyde (OPA) and fluorene methoxycarbonyl chloride (FMOC), respectively. HPLC was used to determine the amino acids with an Agilent 1100 apparatus and a ZORBAX Eclipse AAA column (4.6 x 150 mm, 3.5 μm, Agilent, CA, USA). Sodium dihydrogen phosphate (40 mM, pH7.8) was used as the mobile phase A. The mobile phase B contained acetonitrile, methanol, and water (volume ratio 45:45:10). The gradient was 0% B (0 min), 0% B (1 min), 57% B (23 min), 100% B (27 min), 100% B (34 min), 0% B (40 min), and 0% B (41 min). The amino acids were quantified by external standards.

[d] Appropriate samples were mixed with 4 mL HNO_3, 1 mL HCl, and 0.5 mL H_2O_2 at a room temperature for 15 min. Then, the temperature raised to 220 °C in 30 min and held for 20 min. The mixtures were filtered through a 0.22 μm filter membrane and adjusted to 10 mL using deionized water. Four kinds of inorganic ions were analyzed by ICP-OES (Agilent 720, Agilent, CA, USA).

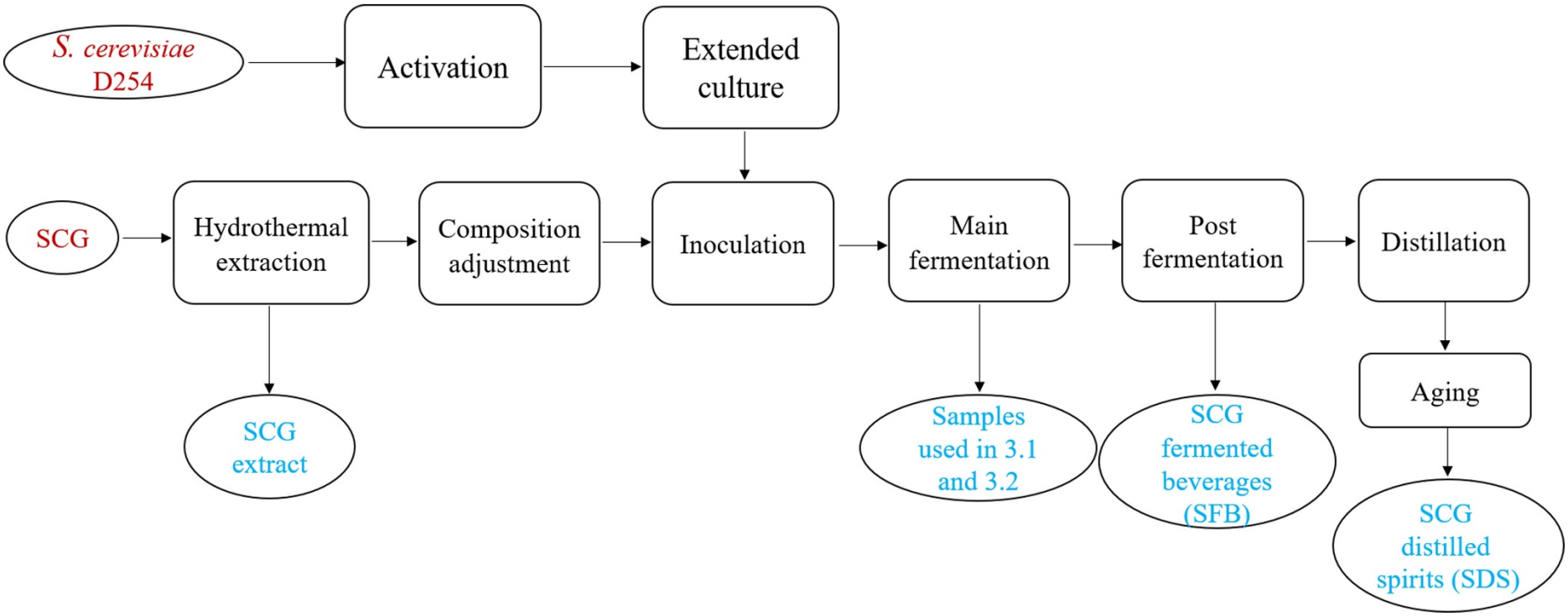

Figure S1. The brewing process of SCG beverages.

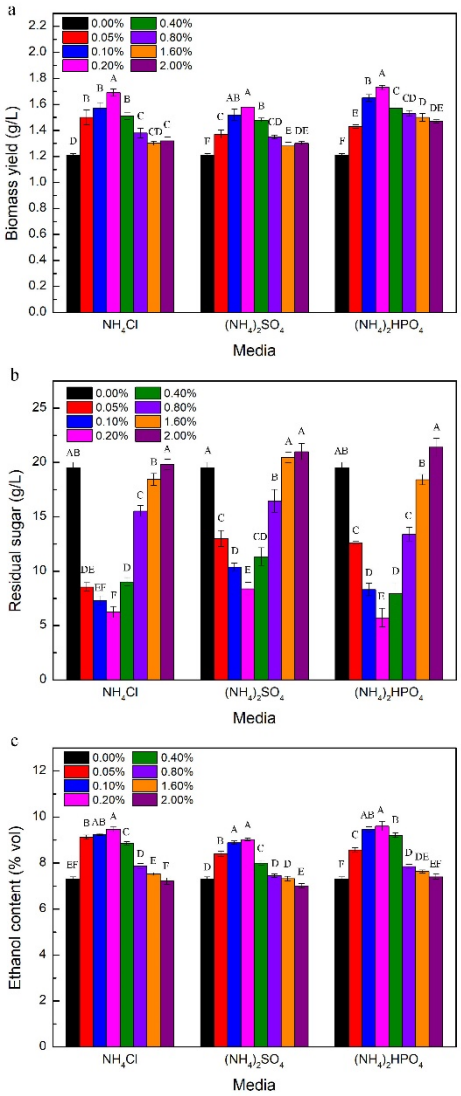
a
0.00%
0.05%
0.10%
0.20%
0.40%
0.80%
1.60%
2.00%
Biomass yield (g/L)
NH4Cl
(NH4)2SO4
(NH4)2HPO4
Media
b
Residual sugar (g/L)
c
Ethanol content (% vol)

Figure S2. Effects of types and concentrations of nitrogen source on **a** biomass yield of D254, **b** residual sugar, and **c** ethanol content in SCG substrate. Values with different capital letters in the columns of the same color are significantly different ($p < 0.05$).

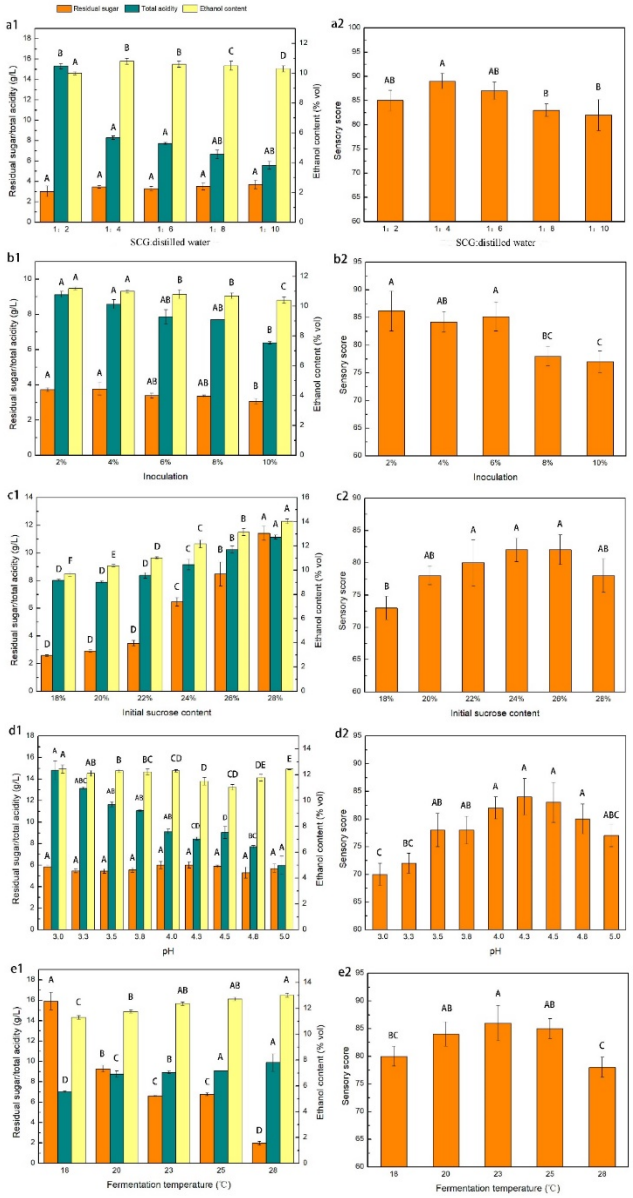
Residual sugar
Total acidity
Ethanol content
a1
Residual sugar/total acidity (g/L)
Ethanol content (% vol)
1：2
1：4
1：6
1：8
1：10
SCG:distilled water
a2
Sensory score
SCG:distilled water
b1
Residual sugar/total acidity (g/L)
Ethanol content (% vol)
2%
4%
6%
8%
10%
Inoculation
b2
Sensory score
Inoculation
c1
Residual sugar/total acidity (g/L)
Ethanol content (% vol)
18%
20%
22%
24%
26%
28%
Initial sucrose content
c2
Sensory score
Initial sucrose content
d1
Residual sugar/total acidity (g/L)
Ethanol content (% vol)
3.0
3.3
3.5
3.8
4.0
4.3
4.5
4.8
5.0
pH
d2
Sensory score
pH
e1
Residual sugar/total acidity (g/L)
Ethanol content (% vol)
16
20
23
25
28
Fermentation temperature (℃)
e2
Sensory score
Fermentation temperature (℃)

Figure S3. Effects of **a** the ratio of SCG **b** the inoculation amount of *S. cerevisiae* D254 **c** the initial content of sucrose **d** pH **e** fermentation temperature on the physicochemical and sensory properties of SFB. Values with different capital letters in the columns of the same color are significantly different ($p < 0.05$). **a** For the optimization of SCG/water ratio, SCG and distilled water were mixed at the ratio of 1:2, 1:4, 1:6, 1:8 and 1:10 (g/mL). 20% sucrose was added and pH was adjusted to 4.0 by citric acid. 4% activated *S. cerevisiae* strain D254 was inoculated and the fermentation was conducted at 25℃ for 9 days. **b** For the optimization of inoculations of *S. cerevisiae*, SCG and distilled water were mixed at the ratio of 1:4. 20% sucrose was added and pH was adjusted to 4.0 by citric acid. *S. cerevisiae* strain D254 was inoculated at a ratio of 2%, 4%, 6%, 8%, and 10%, and the fermentation was conducted at 25℃ for 9 days. **c** For the optimization of sugar degree, SCG and distilled water were mixed at the ratio of 1:4. Sucrose was added at a concentration of 18%, 20%, 22%, 24%, 26%, and 28%. pH was adjusted to 4.0 by citric acid and 6% activated *S. cerevisiae* strain D254 was inoculated. The fermentation was conducted at 25℃ for 9 days. **d** For the optimization of pH, SCG and distilled water were mixed at the ratio of 1:4. 24% sucrose was added and pH was adjusted to 3.0, 3.3, 3.5, 3.8, 4.0, 4.3, 4.5, 4.8, and 5.0 by citric acid. 6% activated *S. cerevisiae* strain D254 was inoculated and the fermentation was conducted at 25℃ for 9 days. **e** For the optimization of fermentation temperature, SCG and distilled water were mixed at the ratio of 1:4. 24% sucrose was added and pH was adjusted to 4.3 by citric acid. 6% activated *S. cerevisiae* strain D254 was inoculated and the fermentation was conducted at 18℃, 20℃, 23℃, 25℃, and 28℃ for 9 days.