**Supplementary data**

**Table S1** Volatile compounds of sour bamboo shoots during fermentation measure by GC-MS.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| NO. | Volatile components | Relative content (μg/L) |  |  |
| 1d | 7d | 14d | 21d | 28d | 60d |  |
| Alcohols |  |  |  |  |  |  |  |
| 1 | 1-Heptanol | - | - | 2.68±0.00c | 3.42±0.19b | - | 6.25±0.00a |  |
| 2 | 1-Hexanol, 2-ethyl- | 7.39 ±0.00b | - | 7.00±1.11bc | 12.94±0.00a | 7.34±0.00bc | 5.49±0.71c |  |
| 3 | 2-Octen-1-ol, (E)- | - | 4.39±1.08b | - | - | - | 6.01 ±0.00a |  |
| 4 | 1-Octanol | 5.11±0.72b | 13.04±2.72b | 16.30±3.08ab | 14.01±1.50b | 20.39±8.45ab | 32.07±6.16a |  |
| 5 | Linalool | 7.81±1.5bc | - | 6.77±0.25c | 12.57±3.00a | 11.07±2.92ab | - |  |
| 6 | Cyclohexanol, 5-methyl-2-(1-methylethyl)-, (1.alpha.,2.beta.,5.alpha.)-(.+/-.)- | - | - | 1.55±0.22b | 0.82±0.00c | 0.59±0.00d | 3.08±0.00a |  |
| 7 | 10-Undecen-1-ol | - | 4.62±1.51c | 2.38±0.00d | 6.34±0.14b | - | 11.31±0.00a |  |
| 8 | 3,6-Nonadien-1-ol, (E,Z)- | 2.54±0.23a | 60.9±28.7a | 49.27±30.48a | 56.14±6.36a | 91.44±87.48a | 93.96±39.21a |  |
| 9 | 1-Decanol | - | 1.69±0.62a | 3.21±1.51a | 3.08±1.35a | - | 6.16±6.86a |  |
| 10 | [1,1'-Biphenyl]-2,3'-diol, 3,4',5,6'-tetrakis(1,1-dimethylethyl)-l | 7.21±1.64ab | 2.54±1.59b | 6.93±4.33ab | 6.09±3.25ab | 3.58±0.68b | 14.65±8.32a |  |
| 11 | Silanediol, dimethyl- | 104.8±181.51b | 4.9±4.34b | - | 606.56±260.51a | 409.24±33.54a | 3.72±0.00b |  |
| 12 | 2-Ethyl-1-hexanol | 7.1±0.85c | 4.34±0.72d | 5.01±0.00d | 8.61±1.14ab | 7.45±0.14bc | 8.75±0.00a |  |
| 13 | 1-Nonanol | - | 0.89±0.02b | 1.87±0.49b | 5.43±1.48b | 4.15±1.21b | 47.81±38.49a |  |
| 14 | 1-Dodecanol | 9.05±1.37a | 1.53±0.37a | 10.4±15.78a | 5.7±4.37a | 2.21±0.46a | 5.07±3.33a |  |
| 15 | Cedrol | - | 1.35±0.12c | 1.42±0.06c | 6.48±0.00a | 2.69±0.00b | 2.36±1.3bc |  |
| 16 | Ethylene glycol - Adipate - Diethylene glycol | 5.29±0.00a | 2.86±0.02b | 2.56±0.83b | - | 4.39±0.76a | 2.75±0.00b |  |
| 17 | Isobutanol, TBDMS derivative | 3.55±0.00ab | - | - | 2.86±0.00b | 3.72±1.05a | - |  |
| 18 | 1,6,10-Dodecatrien-3-ol, 3,7,11-trimethyl-, (E)- | 0.62±0.00bc | 1.29±0.00ab | - | 0.57±0.15bc | 0.99±0.00b | 2.09±1.16a |  |
| 19 | Ledol | 4.13±0.81b | 3.05±0.38b | 3.57±0.00b | 2.49±0.11b | 4.37±0.53b | 9.09±2.7a |  |
| 20 | Z-4-Dodecenol | - | 5.1±0.00c | 6.62±0.00c | 7.79±0.00c | 12.33±3.73b | 20.92±0.00a |  |
| 21 | Diethylene glycol, 2TMS derivative | - | 1.08±0.00b | 1.04±0.12b | 2.46±0.00a | - | 2.74±0.38a |  |
| 22 | (5S,6R,7S,10R)-7-Isopropyl-2,10-dimethylspiro[4.5]dec-1-en-6-ol | - | 1.56±0.00b | 1.43±0.77b | 0.87±0b | - | 5.85±2.12a |  |
| 23 | 1-Hexadecanol | - | - | 3.28±0.00 | - | - | 13.66±0.00 |  |
| 24 | 1-Hexanol | - | - | - | - | 33.06±0.00 | - |  |
| Esters |  |  |  |  |  |  |  |
| 25 | 2,2,4-Trimethyl-1,3-pentanediol diisobutyrate | 5.06±0.27a | 2.26±0.5a | 2.46±1.63a | 22.4±27.98a | 8.32±3.78a | 6.89±6.35a |  |
| 26 | Propanoic acid, 2-methyl-, 3-hydroxy-2,2,4-trimethylpentyl ester | 1.71±0.68bc | 1.28±0.62c | 2.3±0.46bc | 6.44±3.61a | 4.56±1.77abc | 4.99±0.96ab |  |
| 27 | Hexanoic acid, 3,5,5-trimethyl-, 2-ethylhexyl ester | 4.49±1.97b | 4.8±2.05b | 3.41±0.46b | 3.5±1.00b | 3.94±0.03b | 10.59±4.09a |  |
| 28 | 1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester | 196.54±38.73a | 4.52±0.53b | 9.39±8.46b | 25±9.60b | 21.37±12.55b | 22.41±2.81b |  |
| 29 | Dibutyl phthalate | 11.62±2.78ab | 4.47±1.04b | 9.23±8.42ab | 8.91±2.43ab | 23.8±17.3a | 20.21±1.51ab |  |
| 30 | Methyl salicylate | 1.44±0.83b | 1.75±0.31b | 2.54±0.78b | 2.08±0.72b | 9.08±3.57a | 3.64±0.89b |  |
| 31 | Benzenepropanoic acid, 3,5-bis(1,1-dimethylethyl)-4-hydroxy-, methyl ester | 3.89±5.46a | 4.22±2.23a | 2.43±1.62a | 3.69±0.94a | 1.7±0.00a | - |  |
| 32 | 3-Methyl-2-(trimethylsilyl)oxybenzoic acidtrimethylsilyl ester | 19.79±0.00a | 13.7±0.00bc | 9.24±0.00d | 18.32±3.18a | 16.89±2.68ab | 10.66±0.00cd |  |
| 33 | Oxalic acid, isobutyl hexyl ester | - | - | - | - | 187.27±142.61a | - |  |
| Aldehydes |  |  |  |  |  |  |  |
| 34 | Octanal | 2.11±0.44b | 1.44±0.53b | 5.02±2.77a | 5.43±1.13a | 2.3±0.72b | 3.78±0.06ab |  |
| 35 | 2,5-Dihydroxybenzaldehyde, 2TMS derivative | 41.27±6.47bc | 24.86±3.38c | 29.05±10.69c | 54.68±11.49ab | 42.4±4.86abc | 61.35±16.07a |  |
| 36 | Nonanal | 12.17±3.01a | 5.22±2.89a | 13.7±13.66a | 20.09±4.29a | 14.51±6.58a | 17.85±8.72a |  |
| 37 | Decanal | 7.58±2.4a | 3.13±0.76a | 11.77±15.25a | 10.92±3.04a | 9.9±2.63a | 10.39±4.31a |  |
| 38 | Benzaldehyde, 2,4-dimethyl- | 9.78±1.02b | 213.63±122.08a | 76.48±57.75b | 47.37±17.07b | 20.85±14.09b | 35.51±13.08b |  |
| 39 | Dodecanal | 1.73±0.34a | 1.72±0.93a | 2.33±1.33a | 2.26±0.27a | 2.57±0.42a | 1.87±1.42a |  |
| 40 | 3-Hydroxy-4-methoxybenzaldehyde, TBDMS | 26.35±3.52b | 16.58±1.81c | 20.44±8.73bc | 35.87±0.00b | 27.29±2.42b | 26.34±3.34b |  |
| 41 | Undecanal | - | - | 4.89±0.00a | - | - | 2.51±1.25b |  |
| 42 | Benzeneacetaldehyde | 13.03±2.35a | - | 2.95±0.00d | 10.1±0.00b | - | 5.82±0.00c |  |
| 43 | Benzaldehyde | 7.27±2.85bc | - | 14.78±0.00a | 9.1±0.00b | 7.46±2.78bc | 4.91±0.00c |  |
| 44 | 3,5-di-tert-Butyl-4-hydroxybenzaldehyde | 1.29±0.19bc | 1.01±0.00bc | 1.01±0.00bc | 2.83±1.49a | 1.6±0.57ab | - |  |
| 45 | 2-Isopropylidene-3-methylhexa-3,5-dienal | - | - | 1.28±0.06b | 2.17±0.00a | - | - |  |
| 46 | Tetradecanal | - | - | 1.31±0.35a | 1.12±0.6a | - | - |  |
| 47 | Hexanal | - | - | - | 5.19±0.00 | - | - |  |
| Phenols |  |  |  |  |  |  |  |
| 48 | 2,4-Di-tert-butylphenol | 1645.6±106ab | 1376.87±100.76b | 1258.82±170.79b | 1722.8±452.03ab | 1519.28±44.57ab | 2100.92±625.11a |  |
| 49 | 2-Methoxy-4-vinylphenol | - | - | - | 21.3±10.5b | - | 56.96±24.51a |  |
| 50 | 1,3,5-Benzetriol, 3TMS derivative | 1.09±0.00c | 0.58±0.00d | - | 5.94±0.00a | 1.75±0.18b | - |  |
| Ketones |  |  |  |  |  |  |  |
| 51 | Isophorone | 55.89±1.33a | 19.75±8.8b | 14.26±1.56b | 26.47±1.18b | 43.3±13.31a | - |  |
| 52 | 2,5-cyclohexadien-1-one, 2,6-bis(1,1-dimethylethyl)-4-hydroxy-4-methyl- | 5.84±1.09b | 4.68±0.55b | 4.56±0.64b | 12.23±6.86a | 7.35±0.67ab | 5.44±0.00b |  |
| 53 | 2,5-Cyclohexadiene-1,4-dione, 2,6-bis(1,1-dimethylethyl)- | 2.2±1.29b | 2.5±1.12ab | 1.81±0.83b | 5.32±1.85a | 2.37±0.25b | 3.63±2.04ab |  |
| 54 | 7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione | 11.41±2.53a | 2.19±0.00a | 4.96±0.00a | 30.63±28.37a | 29.99±26.52a | - |  |
| 55 | Cyclohexanone, 2-cyclohexylidene- | 21.48±28.91a | 2.29±0.96a | 9.57±7.74a | 2.82±0.47a | 2.85±0.42a | 6.65±4.87a |  |
| 56 | 2,2,6,7-Tetramethyl-10-oxatricyclo[4.3.0.1(1,7)]decan-5-one | 0.71±0.00c | 0.81±0.17c | 1.27±0.34b | 2.02±0.00a | 1.37±0.16b | 1.17±0.00b |  |
| 57 | 5,9-Undecadien-2-one, 6,10-dimethyl- | 2.71±0.84b | - | 0.9±0.00c | 7.88±0.00a | 3.8±1.71b | 2.97±0b |  |
| 58 | 5,9-Undecadien-2-one, 6,10-dimethyl-, (E)- | 2.38±0.00b | 1.39±0.00bc | 3.03±0.73b | 5.91±2.12a | 2.87±0.00b | - |  |
| 59 | 2,4,4-Trimethyl-3-(3-methylbutyl)cyclohex-2-enone | 0.6±0.00c | - | 1.03±0.00b | 1.33±0.25a | 1.47±0.00a | - |  |
| 60 | 2-Pentadecanone | 1.79±0.52b | - | - | 0.49±0.00c | 1.61±0.34b | 2.39±0.00a |  |
| 61 | Benzophenone | - | - | - | 3.45±0.42c | 6.00±0.00a | 4.97±0.88b |  |
| 62 | 2-Octanone | - | - | - | - | - | 2.41±0.42a |  |
| Others |  |  |  |  |  |  |  |
| 63 | Naphthalene | 1.55±0.71c | 19.16±5.63ab | 7.29±5.17bc | 5.39±2.88bc | - | 32.14±16.63a |  |
| 64 | 2-Hydrazino-4,6-dimethylpyrimidine, 3TMS derivative | 1.12±0.07a | - | 1.01±0.00a | 1.42±0.64a | 1.23±0.20a | - |  |
| 65 | Nordiazepam, tert-butyldimethylsilyl derivative | 6.66±0.32ab | 2.41±2.27bc | 8.4±1.26a | 7.95±6.01ab | 5.03±1.52abc | - |  |
| 66 | Thymol | 8.11±1.16a | - | - | - | - | - |  |
| 67 | 1,4-Benzenediamine, N,N-diethyl- | - | - | - | - | 20.41±18.74a | - |  |
| 68 | (-)-O-Acetylmalic anhydride | - | - | - | - | 177.9±136.05a | - |  |
| 69 | .beta.-Myrcene | 1.13±0.26a | - | - | 0.94±0.20a | - | - |  |
| 70 | D-Limonene | 50.89±18.9a | 1.7±0.14b | 1.88±1.08b | 48.49±23.84a | 8.02±5.61b | 2.47±0.00b |  |
| 71 | Benzene, 2-ethyl-1,4-dimethyl- | - | 0.93±0.10b | 0.65±0.00b | - | - | 3.87±2.16a |  |
| 72 | Oxime-, methoxy-phenyl-\_ | 78.78±136.45ab | 1.92±0.00b | 0.48±0.00b | 351.93±364.19a | 182.62±27.38ab | - |  |
| 73 | Benzene, pentamethyl- | 1.22±1.77b | 1.09±1.03b | 0.59±0.00b | - | - | 3.83±0.00a |  |
| 74 | Ethylbenzene | - | 4.91±0.98b | - | - | - | 7.06±2.38a |  |
| 75 | o-Xylene | - | 42.99±0.00b | - | - | - | 88.87±15.66a |  |
| 76 | Benzene, 1,2,4,5-tetramethyl- | - | 4.97±2.48b | 2.98±1.98b | - | - | 25.06±20.17a |  |
| Acids |  |  |  |  |  |  |  |
| 77 | Heptadecane | 2.82±3.97bc | 3.87±0.54b | 1.97±1.7bc | 3.24±0.44bc | - | 7.84±0.04a |  |
| 78 | 2,6-Dihydroxybenzoic acid, 3TMS derivative | - | 2.31±0.98b | - | 3.71±0.21a | 4.41±0.12a | - |  |
| 79 | 2,5-Dihydroxybenzoic acid, 3TMS derivative | 1.00±1.73b | - | - | 1.9±0.36b | 9.51±2.47a | 7.7±0.00a |  |
| 80 | Acetic acid | 1.09±1.89b | - | - | 15.43±9.04a | 2.45±0.00b | - |  |

-: not detected.

Different letters in same row indicate significant differences between groups (*P* < 0.05).

**Table S2** Alpha diversity of the microbial community in sour bamboo shoots during the fermentation process.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Chao1 | ACE | Shannon | Simpson | Coverage |
| 1d | 353.54±18.48b | 354.31±18.39b | 4.86±0.24bc | 0.92±0.01a | 1.0 |
| 7d | 638.04±130.02b | 638.99±130.03b | 4.61±0.35bc | 0.76±0.07b | 1.0 |
| 14d | 838.88±76.95b | 840.25±77.06b | 5.43±0.23ab | 0.92±0.01a | 1.0 |
| 21d | 1234.97±120.55a | 1237.11±120.63a | 6.26±0.13a | 0.96±0.02a | 1.0 |
| 28d | 871.5±86.5b | 871.61±86.61b | 3.21±0.21c | 0.62±0.02c | 1.0 |



**Figure S1** Correlation among reducing sugar, hardness, fracturability, chewiness, TA, pH, and nitrite of sour bamboo shoots conducted by Pearson’s correlation analysis. Circles represent a positive (orange) or negative (blue) correlation between the quality indicators. The size of the circle represents the levels of the correlation coefficient (r), \* *P* ≤0.05,



**Figure S2** PCoA analysis of the microbial community in sour bamboo shoots during fermentation process.



**Figure S3** UPGMA analysis of the microbial community in sour bamboo shoots during fermentation process.