Table S1 Volatile compounds detected by GC-MS in sun-dried black tea

| No | Time (min) | Volatile compounds | RI | Identification |
|---|---|---|---|---|
| 1 | 3.845 | Hexanal | 800 | MS/RI |
| 2 | 5.325 | 2-Hexenal | 851 | MS/RI |
| 3 | 5.62 | 4-Methyl-1-pentanol | 861 | MS/RI |
| 4 | 6.655 | 5-Methyl-2-hexanol | 897 | MS/RI |
| 5 | 8.92 | Benzaldehyde | 960 | MS/RI |
| 6 | 9.695 | 1-Octen-3-ol | 982 | MS/RI |
| 7 | 9.95 | 6-Methyl-5-hepten-2-one | 989 | MS/RI |
| 8 | 10.05 | 2-Pentyl-furan | 992 | MS/RI |
| 9 | 11.025 | Hexanoic acid | 1015 | MS/RI |
| 10 | 11.42 | o-Cymene | 1024 | MS/RI |
| 11 | 11.565 | D-Limonene | 1027 | MS/RI |
| 12 | 11.84 | 2,2,6-Trimethyl-cyclohexanone | 1033 | MS/RI |
| 13 | 12.06 | (E)-β-Ocimene | 1038 | MS/RI |
| 14 | 12.43 | Benzeneacetaldehyde | 1046 | MS/RI |
| 15 | 12.55 | 1-Ethyl-1H-pyrrole-2-carbaldehyde | 1048 | MS/RI |
| 16 | 13.32 | (E)-2-Hexenoic acid | 1065 | MS/RI |
| 17 | 13.64 | Linalool oxide I | 1072 | MS/RI |
| 18 | 14.39 | Linalool oxide II | 1089 | MS/RI |
| 19 | 15.13 | Linalool | 1105 | MS/RI |
| 20 | 15.245 | Hotrienol | 1108 | MS/RI |
| 21 | 15.755 | Phenylethyl alcohol | 1119 | MS/RI |
| 22 | 16.865 | Lilac aldehyde A | 1144 | MS/RI |
| 23 | 17.075 | (R,S)-5-Ethyl-6-methyl-3E-hepten-2-one | 1149 | MS/RI |
| 24 | 17.235 | Lilac aldehyde B | 1153 | MS/RI |
| 25 | 17.415 | (E,Z)-2,6-Nonadienal | 1157 | MS/RI |
| 26 | 17.44 | Nerol oxide | 1157 | MS/RI |
| 27 | 17.9 | L-Borneol | 1168 | MS/RI |
| 28 | 18.47 | Epoxylinalol | 1181 | MS/RI |

| | | | | |
|---|---|---|---|---|
| 29 | 19.13 | α-Terpineol | 1196 | MS/RI |
| 30 | 19.29 | Methyl salicylate | 1199 | MS/RI |
| 31 | 19.435 | Safranal | 1202 | MS/RI |
| 32 | 20.38 | β-Cyclocitral | 1222 | MS/RI |
| 33 | 20.925 | (Z)-Geraniol | 1234 | MS/RI |
| 34 | 21.055 | (3Z)-3-Hexenyl 2-methylbutanoate | 1237 | MS/RI |
| 35 | 21.255 | (Z)-3-Hexenyl isovalerate | 1241 | MS/RI |
| 36 | 21.61 | Vinyl caproate | 1248 | MS/RI |
| 37 | 22.04 | β-Cyclohomocitral | 1258 | MS/RI |
| 38 | 22.19 | Geraniol | 1261 | MS/RI |
| 39 | 22.35 | (E)-2-Decenal | 1264 | MS/RI |
| 40 | 22.84 | α-Citral | 1274 | MS/RI |
| 41 | 23.445 | Anethole | 1287 | MS/RI |
| 42 | 23.625 | 1-Methyl-naphthalene | 1291 | MS/RI |
| 43 | 23.825 | Theaspirane | 1295 | MS/RI |
| 44 | 24.045 | Tridecane | 1300 | MS/RI |
| 45 | 26.21 | Dehydro-ar-ionene | 1348 | MS/RI |
| 46 | 26.365 | α-Ionene | 1351 | MS/RI |
| 47 | 26.695 | (Z)-β-Damascenone | 1359 | MS/RI |
| 48 | 26.81 | 2,6,10-Trimethyl-hexadecane | 1361 | MS/RI |
| 49 | 27.515 | Geranic acid | 1377 | MS/RI |
| 50 | 27.675 | (E)-β-Damascenone | 1381 | MS/RI |
| 51 | 27.87 | n-Hexyl caproate | 1385 | MS/RI |
| 52 | 28.63 | 6,10-Dimethyl-2-undecanone | 1402 | MS/RI |
| 53 | 29.02 | Caryophyllene | 1412 | MS/RI |
| 54 | 29.515 | α-Ionone | 1425 | MS/RI |
| 55 | 29.69 | 4-(2,4,4-Trimethyl-cyclohexa-1,5-dienyl)-but-3-en-2-one | 1429 | MS/RI |
| 56 | 29.94 | Dihydro-β-ionone | 1435 | MS/RI |
| 57 | 30.635 | Geranyl acetone | 1453 | MS/RI |
| 58 | 31.295 | 3-Methyl-tetradecane | 1469 | MS/RI |

| | | | | |
|---|---|---|---|---|
| 59 | 31.93 | β-Ionone | 1485 | MS/RI |
| 60 | 32.13 | 5-Methyl-2-phenyl-2-hexenal | 1490 | MS/RI |
| 61 | 32.505 | Pentadecane | 1500 | MS/RI |
| 62 | 32.86 | α-Farnesene | 1509 | MS/RI |
| 63 | 33.005 | Butylated hydroxytoluene | 1513 | MS/RI |
| 64 | 33.225 | 3,5-Di-t-butylphenol | 1518 | MS/RI |
| 65 | 33.605 | Dihydroactinidiolide | 1528 | MS/RI |
| 66 | 33.865 | (-)-Spathulenol | 1535 | MS/RI |
| 67 | 35.085 | (E)-Nerolidol | 1566 | MS/RI |
| 68 | 36.43 | Hexadecane | 1600 | MS/RI |
| 69 | 37.44 | 2,6,10-Trimethyl-tetradecane | 1627 | MS/RI |
| 70 | 37.58 | 6-epi-shyobunol | 1631 | MS/RI |
| 71 | 38.255 | 2,6,10-Trimethyl-pentadecane | 1649 | MS/RI |
| 72 | 38.6 | 8-Hexyl-pentadecane | 1658 | MS/RI |
| 73 | 39.315 | 2,2',5,5'-Tetramethyl-1,1'-biphenyl | 1677 | MS/RI |
| 74 | 40.15 | Heptadecane | 1700 | MS/RI |
| 75 | 40.345 | 2,6,10,14-Tetramethyl-pentadecane | 1705 | MS/RI |
| 76 | 43.695 | Octadecane | 1800 | MS/RI |
| 77 | 45.27 | 6,10,14-Trimethyl-2-pentadecanone | 1855 | MS/RI |
| 78 | 45.625 | Caffeine | 1868 | MS/RI |
| 79 | 46.065 | Diisobutyl phthalate | 1884 | MS/RI |
| 80 | 47.82 | Farnesyl acetone | 1923 | MS/RI |
| 81 | 48.16 | Methyl palmitate | 1929 | MS/RI |
| 82 | 49.55 | Dibutyl phthalate | 1953 | MS/RI |
| 83 | 51.14 | Ethyl palmitate | 1981 | MS/RI |
| 84 | 54.335 | Methyl linoleate | 2090 | MS/RI |
| 85 | 54.78 | Phytol | 2108 | MS/RI |
| 86 | 59.1 | Squalene | 2831 | MS/RI |

Table S2 The quantitative results of odor-active compounds

| Time | Odor-active compounds | Concentration (μg/kg) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 | Sample 6 | Sample 7 | Sample 8 | Sample 9 | Sample 10 | Sample 11 |
| 27.67 | (E)-β-Damascenone | 125.08 | 136.42 | 99.02 | 238.97 | 125.52 | 109.49 | 69.77 | 97.13 | 167.15 | 58.86 | 126.46 |
| 31.93 | β-Ionone | 248.43 | 271.30 | 317.45 | 257.71 | 302.59 | 244.72 | 297.74 | 409.08 | 297.86 | 282.99 | 292.71 |
| 29.94 | Dihydro-α-ionone | 23.80 | 22.16 | 12.39 | 24.15 | 22.56 | 18.95 | 33.86 | 22.38 | 25.16 | 42.08 | 25.94 |
| 15.13 | Linalool | 2110.46 | 1577.18 | 3196.25 | 2466.72 | 1930.80 | 3132.44 | 1961.21 | 1609.58 | 2916.57 | 900.49 | 1570.92 |
| 29.51 | α-Ionone | 49.17 | 38.70 | 66.41 | 55.78 | 71.34 | 45.64 | 90.46 | 113.52 | 64.94 | 79.38 | 66.86 |
| 22.19 | Geraniol | 591.59 | 172.91 | 1324.51 | 1285.33 | 321.98 | 206.56 | 132.79 | 172.65 | 364.92 | 79.47 | 1103.36 |
| 15.75 | Phenylethyl Alcohol | 393.05 | 562.85 | 259.32 | 286.93 | 220.34 | 205.78 | 223.79 | 398.09 | 773.33 | 244.85 | 421.37 |
| 22.35 | (E)-2-Decenal | 0.00 | 0.00 | 0.00 | 0.00 | 147.92 | 0.00 | 10.31 | 122.89 | 0.00 | 0.00 | 0.00 |
| 19.29 | Methyl salicylate | 705.90 | 1016.74 | 1418.74 | 1134.16 | 523.54 | 929.48 | 224.77 | 375.21 | 725.78 | 212.96 | 1384.81 |
| 12.43 | Benzeneacetaldehyde | 174.98 | 0.00 | 52.72 | 11.86 | 329.47 | 219.79 | 190.66 | 494.39 | 680.02 | 249.92 | 450.42 |
| 35.08 | (E)-Nerolidol | 241.40 | 207.64 | 265.05 | 259.03 | 172.47 | 284.47 | 141.15 | 263.99 | 180.87 | 0.00 | 265.00 |
| 14.39 | Linalool oxide II | 981.94 | 1430.37 | 862.25 | 1156.19 | 672.93 | 1853.65 | 853.47 | 1032.64 | 1126.53 | 1077.06 | 1204.17 |
| 9.69 | 1-Octen-3-ol | 9.53 | 10.11 | 0.00 | 9.05 | 18.19 | 9.94 | 178.23 | 0.00 | 15.82 | 0.00 | 7.84 |
| 23.62 | 1-Methyl-naphthalene | 71.48 | 79.81 | 67.46 | 75.28 | 64.75 | 0.00 | 0.00 | 32.79 | 254.97 | 298.42 | 11.73 |
| 20.38 | β-Cyclocitral | 51.07 | 0.00 | 38.17 | 0.00 | 87.02 | 42.22 | 123.52 | 90.90 | 87.29 | 53.40 | 63.49 |
| 3.845 | Hexanal | 53.94 | 69.26 | 74.19 | 80.26 | 44.57 | 78.33 | 23.65 | 164.09 | 147.63 | 36.09 | 76.37 |
| 10.05 | 2-Pentyl-furan | 36.13 | 29.03 | 17.29 | 33.48 | 51.08 | 49.10 | 69.98 | 62.32 | 54.48 | 33.56 | 30.22 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13.64 | Linalool oxide I | 392.87 | 519.05 | 352.21 | 487.96 | 355.09 | 1000.30 | 456.90 | 493.12 | 466.65 | 613.61 | 466.66 |
| 11.56 | D-Limonene | 57.72 | 26.52 | 17.69 | 29.99 | 0.00 | 82.23 | 45.84 | 32.04 | 49.50 | 28.74 | 10.83 |
| 19.13 | α-Terpineol | 90.42 | 76.15 | 0.00 | 38.07 | 39.99 | 75.09 | 69.20 | 18.00 | 55.72 | 113.30 | 0.00 |
| 30.63 | Geranyl acetone | 131.61 | 84.33 | 101.15 | 114.67 | 108.66 | 94.74 | 121.16 | 126.37 | 121.64 | 59.66 | 116.12 |
| 5.32 | 2-Hexenal | 14.61 | 19.98 | 81.73 | 105.40 | 140.54 | 0.00 | 28.96 | 55.90 | 90.71 | 130.01 | 57.60 |
| 33.61 | Dihydroactinidiolide | 144.28 | 147.51 | 249.02 | 188.89 | 204.15 | 125.21 | 328.21 | 245.33 | 0.00 | 356.32 | 201.52 |
| 17.9 | L-Borneol | 40.05 | 57.23 | 31.05 | 46.58 | 8.36 | 0.00 | 0.00 | 38.74 | 0.00 | 0.00 | 82.63 |
| 18.47 | Epoxylinalol | 1049.11 | 1626.95 | 495.69 | 921.55 | 547.57 | 1552.48 | 505.67 | 1184.75 | 764.51 | 927.15 | 1135.44 |
| 23.82 | Theaspirane | 123.47 | 110.12 | 90.19 | 101.50 | 98.27 | 113.05 | 50.88 | 41.06 | 120.02 | 184.22 | 99.57 |
| 19.43 | Safranal | 256.32 | 24.42 | 0.00 | 28.50 | 0.00 | 0.00 | 236.66 | 231.80 | 0.00 | 97.17 | 0.00 |
| 8.92 | Benzaldehyde | 13.68 | 38.24 | 12.21 | 12.94 | 80.55 | 93.61 | 21.29 | 66.66 | 156.01 | 0.00 | 21.85 |
| 11.02 | Hexanoic acid | 76.32 | 65.54 | 75.90 | 57.70 | 55.99 | 0.00 | 0.00 | 41.29 | 148.17 | 29.63 | 0.00 |
| 20.92 | (Z)-Geraniol | 44.34 | 39.33 | 26.87 | 8.79 | 33.12 | 48.10 | 22.92 | 18.36 | 39.88 | 17.56 | 50.56 |
| 29.02 | Caryophyllene | 83.34 | 100.94 | 28.46 | 46.62 | 0.00 | 40.12 | 26.05 | 0.00 | 229.91 | 209.82 | 56.64 |
| 33.01 | Butylated Hydroxytoluene | 46.41 | 53.41 | 38.14 | 42.45 | 32.70 | 22.96 | 46.92 | 41.62 | 48.34 | 66.99 | 39.43 |
| 27.87 | n-Hexyl caproate | 114.41 | 104.49 | 100.45 | 116.67 | 126.64 | 88.27 | 108.70 | 34.50 | 0.00 | 0.00 | 36.48 |
| 21.05 | (3Z)-3-Hexenyl 2-methylbutanoate | 48.33 | 20.85 | 45.34 | 60.83 | 44.21 | 40.80 | 0.00 | 0.00 | 59.17 | 0.00 | 43.08 |
| 27.51 | Geranic acid | 0.00 | 0.00 | 65.96 | 0.00 | 117.92 | 28.67 | 0.00 | 0.00 | 0.00 | 0.00 | 63.91 |

Table S3 The OAVs of odor-active compounds

| Time | Odor-active compounds | OAV | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 | Sample 6 | Sample 7 | Sample 8 | Sample 9 | Sample 10 | Sample 11 |
| 27.67 | (E)-β-Damascenone | 62539.41 | 68208.90 | 49508.12 | 119483.38 | 62760.00 | 54746.15 | 34885.00 | 48563.91 | 83574.12 | 29427.88 | 63229.79 |
| 31.93 | β-Ionone | 35490.69 | 38756.86 | 45349.86 | 36816.08 | 43227.04 | 34960.64 | 42534.41 | 58440.00 | 42551.91 | 40426.71 | 41815.44 |
| 29.94 | Dihydro-α-ionone | 23798.09 | 22158.39 | 12385.95 | 24154.64 | 22561.51 | 18945.12 | 33863.36 | 22379.41 | 25155.64 | 42081.44 | 25936.52 |
| 15.13 | Linalool | 351.74 | 262.86 | 532.71 | 411.12 | 321.80 | 522.07 | 326.87 | 268.26 | 486.10 | 150.08 | 261.82 |
| 29.51 | α-Ionone | 122.93 | 96.75 | 166.03 | 139.45 | 178.36 | 114.10 | 226.15 | 283.81 | 162.35 | 198.46 | 167.14 |
| 22.19 | Geraniol | 184.87 | 54.04 | 413.91 | 401.67 | 100.62 | 64.55 | 41.50 | 53.95 | 114.04 | 24.83 | 344.80 |
| 15.75 | Phenylethyl Alcohol | 80.22 | 114.87 | 52.92 | 58.56 | 44.97 | 42.00 | 45.67 | 81.24 | 157.82 | 49.97 | 85.99 |
| 22.35 | (E)-2-Decenal | 0.00 | 0.00 | 0.00 | 0.00 | 369.80 | 0.00 | 25.77 | 307.21 | 0.00 | 0.00 | 0.00 |
| 19.29 | Methyl salicylate | 44.12 | 63.55 | 88.67 | 70.89 | 32.72 | 58.09 | 14.05 | 23.45 | 45.36 | 13.31 | 86.55 |
| 12.43 | Benzeneacetaldehyde | 27.77 | 0.00 | 8.37 | 1.88 | 52.30 | 34.89 | 30.26 | 78.47 | 107.94 | 39.67 | 71.50 |
| 35.08 | (E)-Nerolidol | 24.14 | 20.76 | 26.51 | 25.90 | 17.25 | 28.45 | 14.12 | 26.40 | 18.09 | 0.00 | 26.50 |
| 14.39 | Linalool oxide II | 16.37 | 23.84 | 14.37 | 19.27 | 11.22 | 30.89 | 14.22 | 17.21 | 18.78 | 17.95 | 20.07 |
| 9.69 | 1-Octen-3-ol | 6.35 | 6.74 | 0.00 | 6.03 | 12.13 | 6.62 | 118.82 | 0.00 | 10.54 | 0.00 | 5.23 |
| 23.62 | 1-Methyl-naphthalene | 9.53 | 10.64 | 8.99 | 10.04 | 8.63 | 0.00 | 0.00 | 4.37 | 34.00 | 39.79 | 1.56 |
| 20.38 | β-Cyclocitral | 10.21 | 0.00 | 7.63 | 0.00 | 17.40 | 8.44 | 24.70 | 18.18 | 17.46 | 10.68 | 12.70 |
| 3.845 | Hexanal | 5.39 | 6.93 | 7.42 | 8.03 | 4.46 | 7.83 | 2.36 | 16.41 | 14.76 | 3.61 | 7.64 |
| 10.05 | 2-Pentyl-furan | 6.02 | 4.84 | 2.88 | 5.58 | 8.51 | 8.18 | 11.66 | 10.39 | 9.08 | 5.59 | 5.04 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13.64 | Linalool oxide I | 3.93 | 5.19 | 3.52 | 4.88 | 3.55 | 10.00 | 4.57 | 4.93 | 4.67 | 6.14 | 4.67 |
| 11.56 | D-Limonene | 5.77 | 2.65 | 1.77 | 3.00 | 0.00 | 8.22 | 4.58 | 3.20 | 4.95 | 2.87 | 1.08 |
| 19.13 | α-Terpineol | 0.21 | 0.18 | 0.00 | 0.09 | 0.09 | 0.17 | 0.16 | 0.04 | 0.13 | 0.26 | 0.00 |
| 30.63 | Geranyl acetone | 2.19 | 1.41 | 1.69 | 1.91 | 1.81 | 1.58 | 2.02 | 2.11 | 2.03 | 0.99 | 1.94 |
| 5.32 | 2-Hexenal | 0.16 | 0.22 | 0.91 | 1.17 | 1.56 | 0.00 | 0.32 | 0.62 | 1.01 | 1.44 | 0.64 |
| 33.61 | Dihydroactinidiolide | 0.29 | 0.30 | 0.50 | 0.38 | 0.41 | 0.25 | 0.66 | 0.49 | 0.00 | 0.71 | 0.40 |
| 17.9 | L-Borneol | 0.29 | 0.41 | 0.22 | 0.33 | 0.06 | 0.00 | 0.00 | 0.28 | 0.00 | 0.00 | 0.59 |
| 18.47 | Epoxylinalol | 0.35 | 0.54 | 0.17 | 0.31 | 0.18 | 0.52 | 0.17 | 0.39 | 0.25 | 0.31 | 0.38 |
| 23.82 | Theaspirane | 0.12 | 0.11 | 0.09 | 0.10 | 0.10 | 0.11 | 0.05 | 0.04 | 0.12 | 0.18 | 0.10 |
| 19.43 | Safranal | 0.26 | 0.02 | 0.00 | 0.03 | 0.00 | 0.00 | 0.24 | 0.23 | 0.00 | 0.10 | 0.00 |
| 8.92 | Benzaldehyde | 0.02 | 0.05 | 0.02 | 0.02 | 0.11 | 0.12 | 0.03 | 0.09 | 0.21 | 0.00 | 0.03 |
| 11.02 | Hexanoic acid | 0.09 | 0.07 | 0.09 | 0.06 | 0.06 | 0.00 | 0.00 | 0.05 | 0.17 | 0.03 | 0.00 |
| 20.92 | (Z)-Geraniol | 0.07 | 0.06 | 0.04 | 0.01 | 0.05 | 0.07 | 0.03 | 0.03 | 0.06 | 0.03 | 0.07 |
| 29.02 | Caryophyllene | 0.06 | 0.07 | 0.02 | 0.03 | 0.00 | 0.03 | 0.02 | 0.00 | 0.15 | 0.14 | 0.04 |
| 33.01 | Butylated Hydroxytoluene | 0.05 | 0.05 | 0.04 | 0.04 | 0.03 | 0.02 | 0.05 | 0.04 | 0.05 | 0.07 | 0.04 |
| 27.87 | n-Hexyl caproate | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | 0.01 |
| 21.05 | (3Z)-3-Hexenyl 2-methylbutanoate | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| 27.51 | Geranic acid | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |

Figure S1

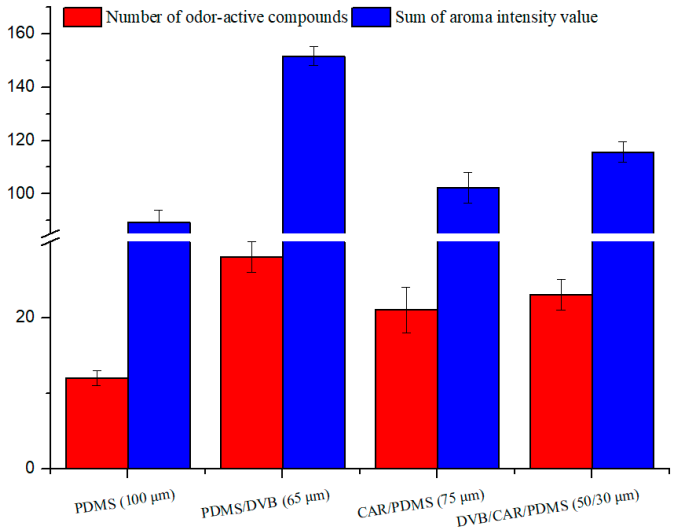


Figure S1 The extraction efficiency of four fibers

Figure S2

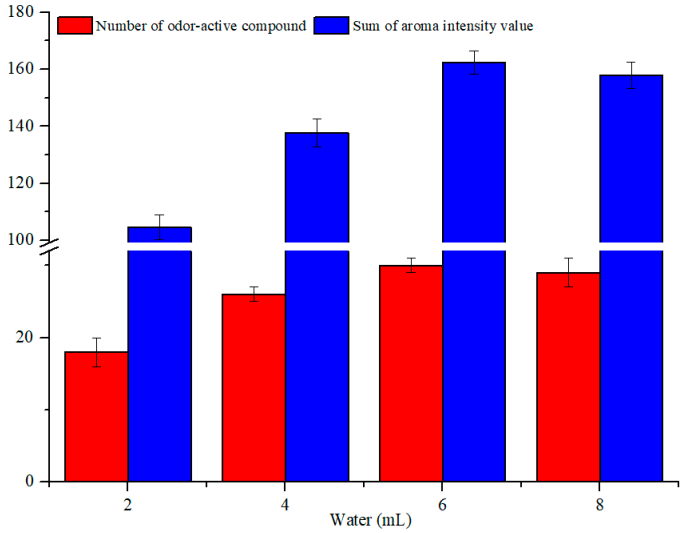


Figure S2 Influence of water amount on the number and sum of intensity value of aroma-active compounds

Figure S3

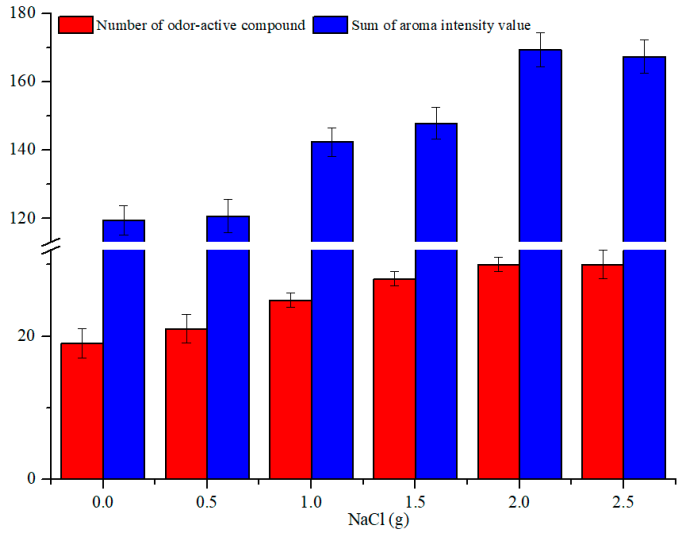


Figure S3 Influence of NaCl amount on the number and sum of intensity value of aroma-active compounds

Figure S4

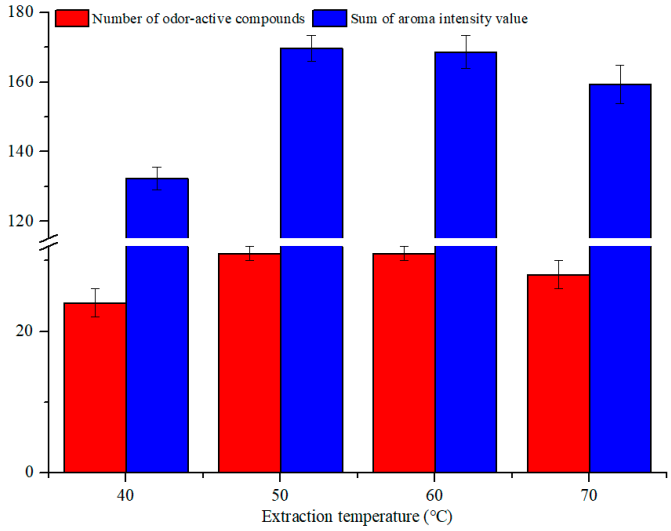


Figure S4 Influence of extraction temperature on the number and sum of intensity value of aroma-active compounds

Figure S5

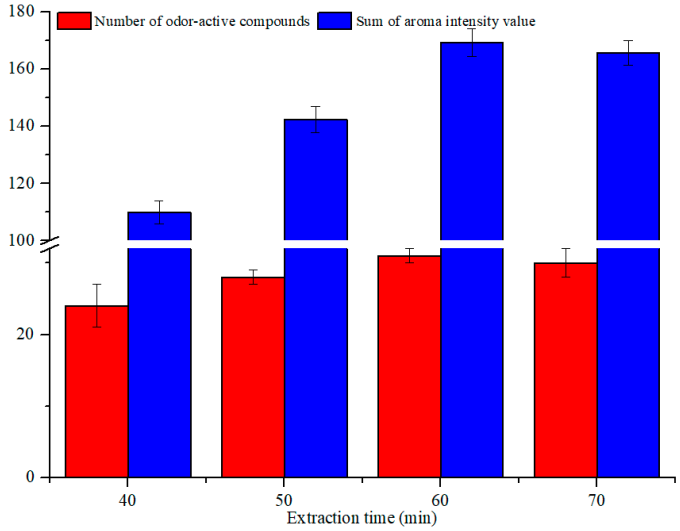


Figure S5 Influence of extraction time on the number and sum of intensity value of aroma-active compounds

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