

Identification of absorbed compounds of Xiao Yao San Jia Wei and pharmacokinetic study in depressed rats by force swimming stress

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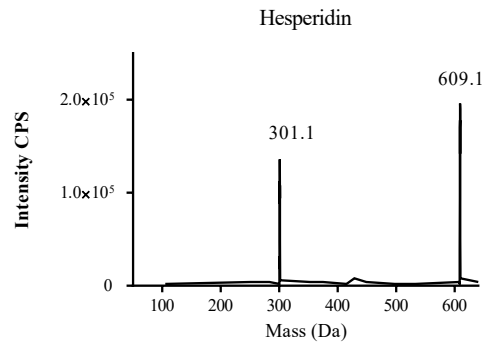
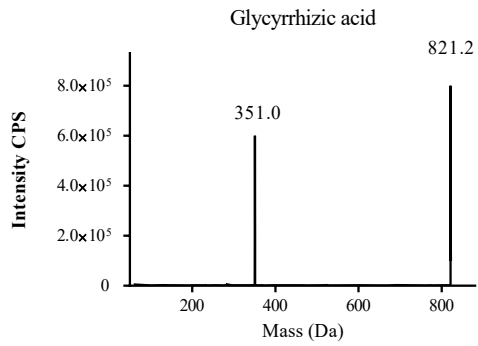
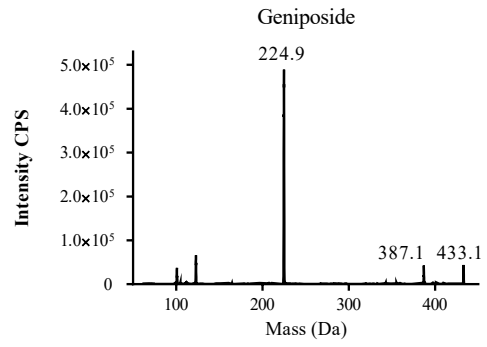
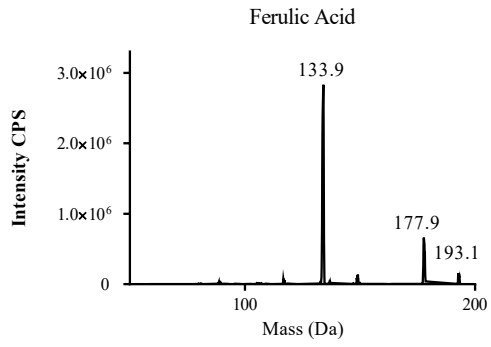
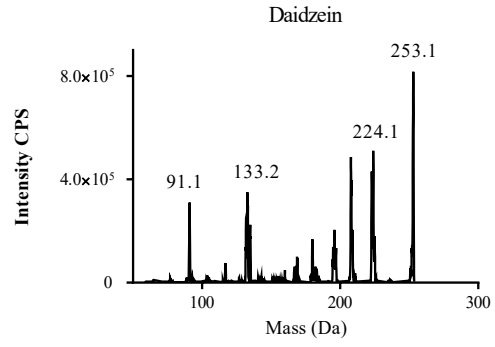
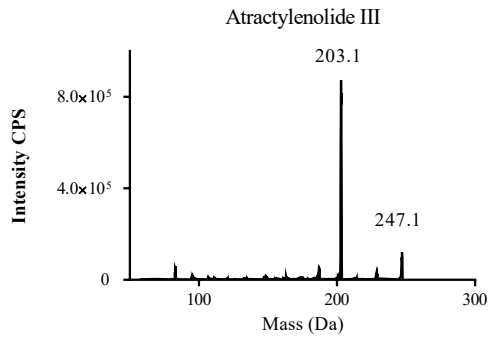
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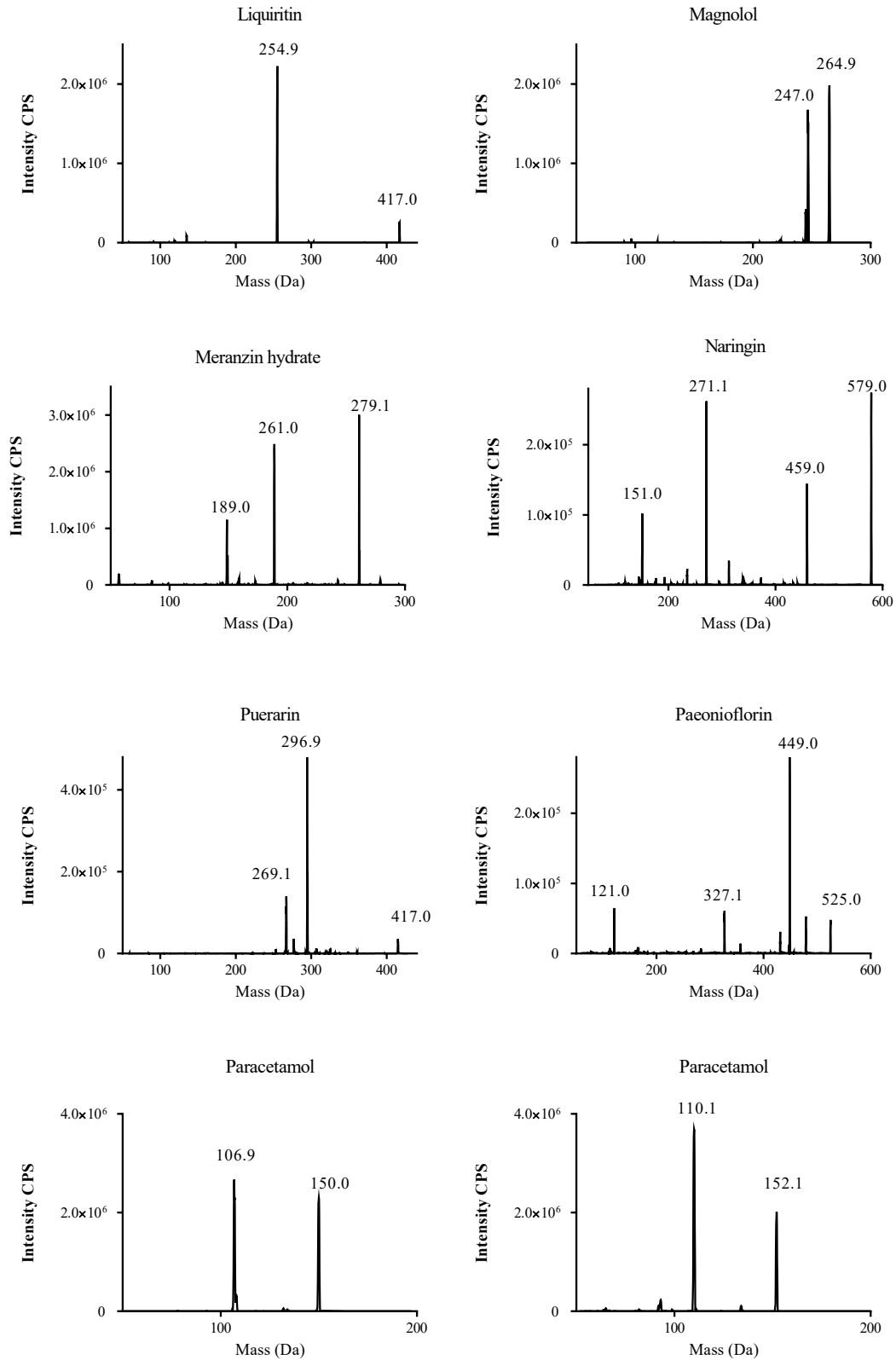
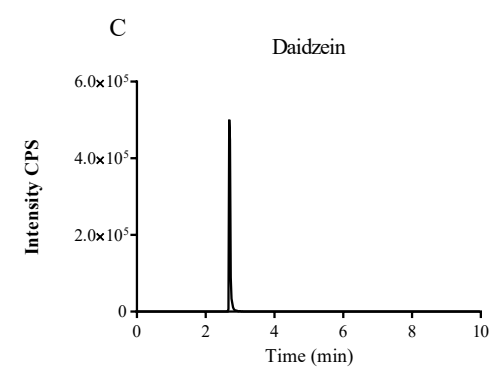
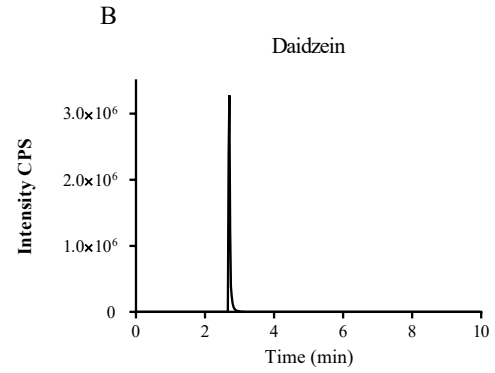
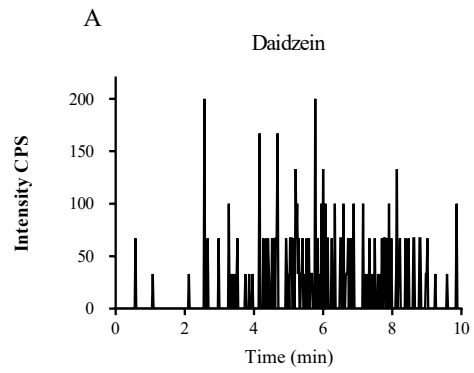
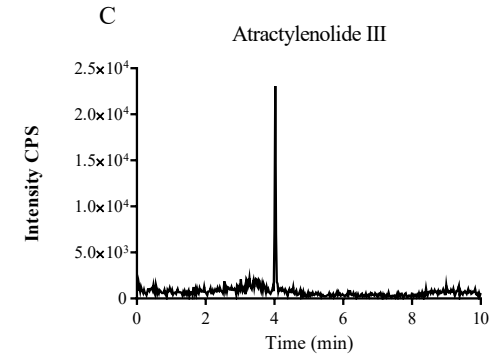
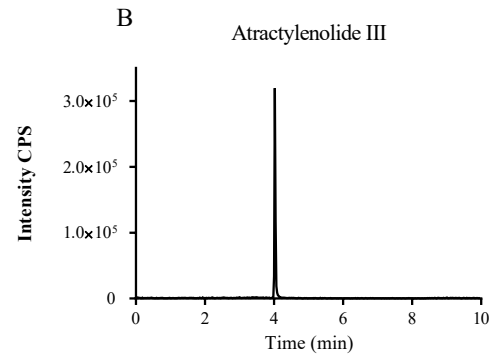
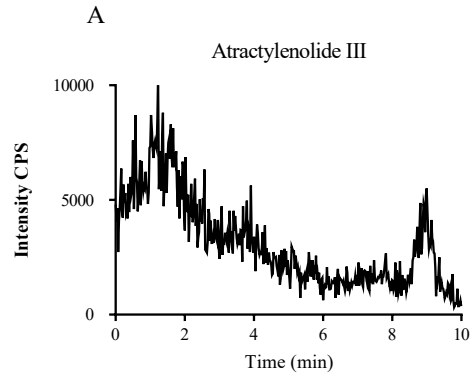
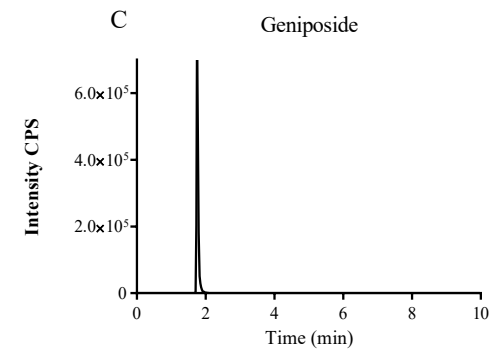
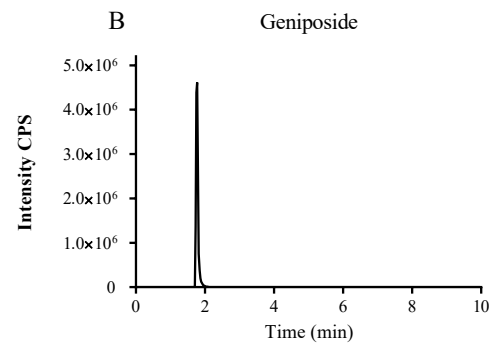
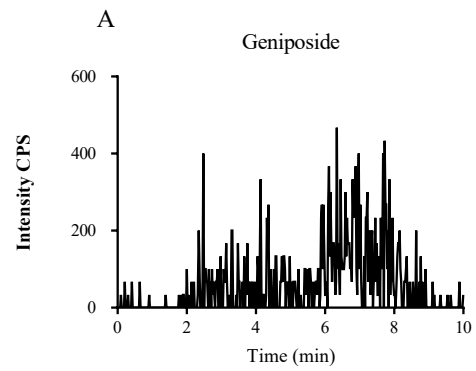
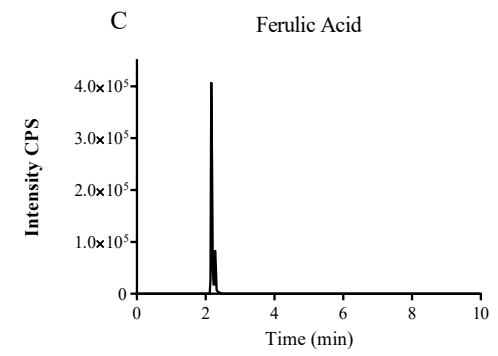
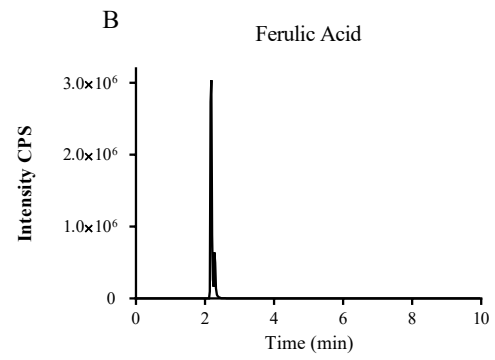
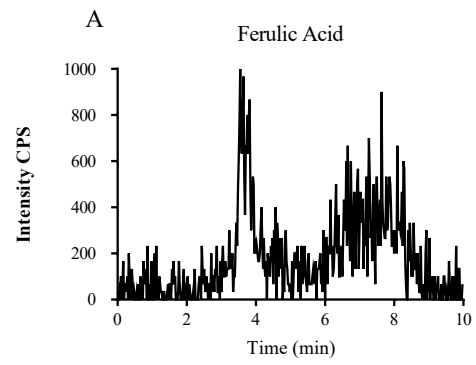
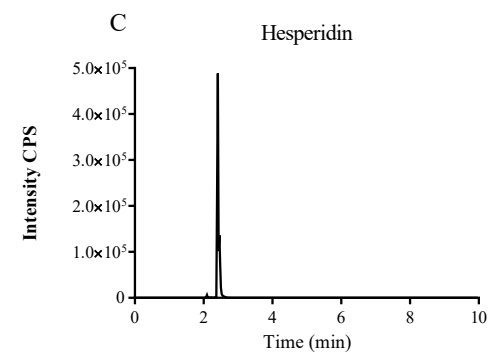
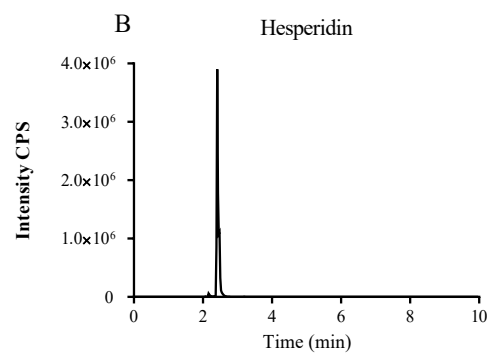
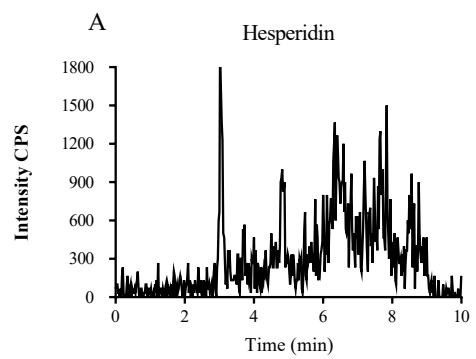
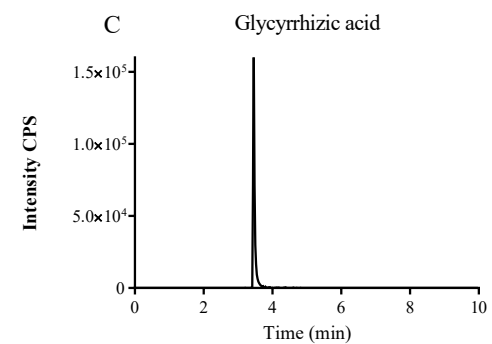
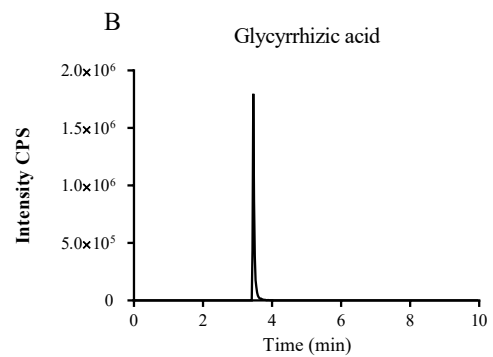
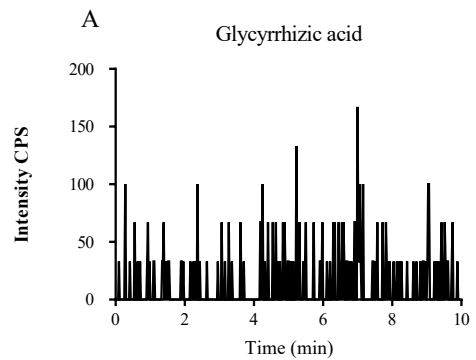
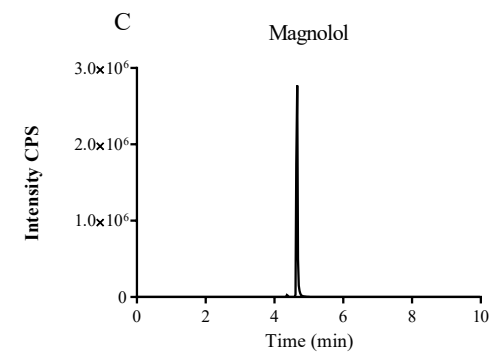
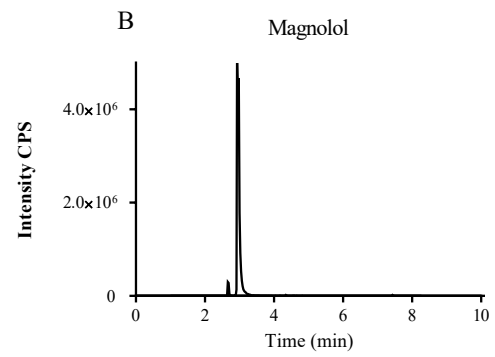
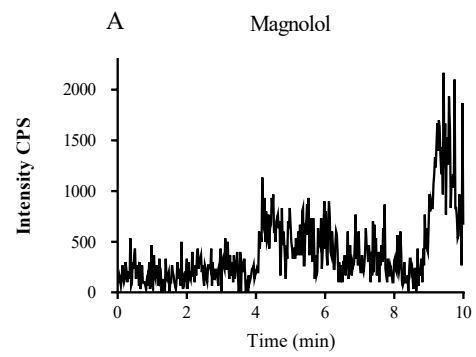
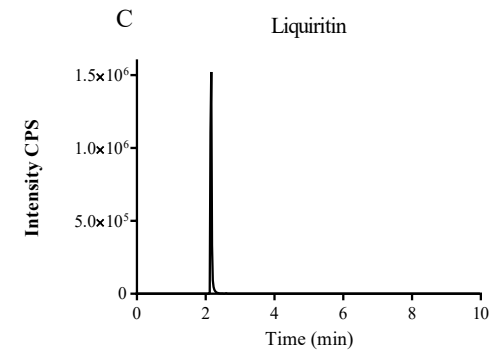
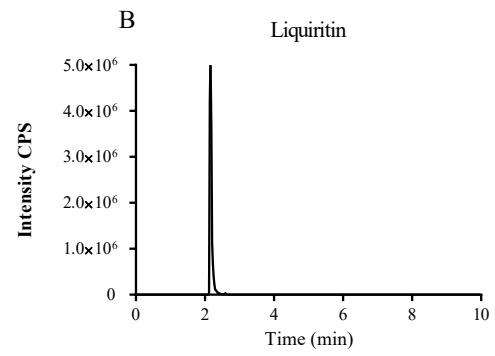
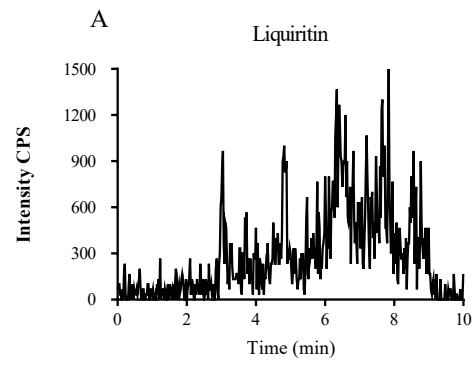


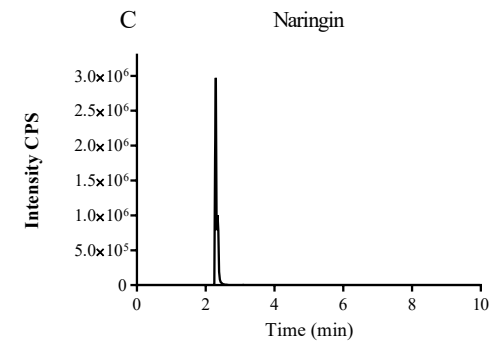
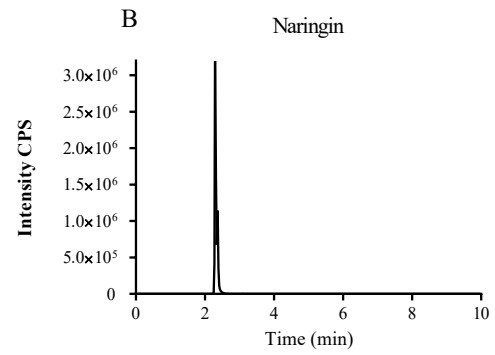
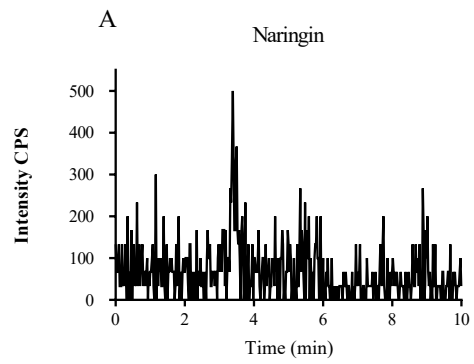
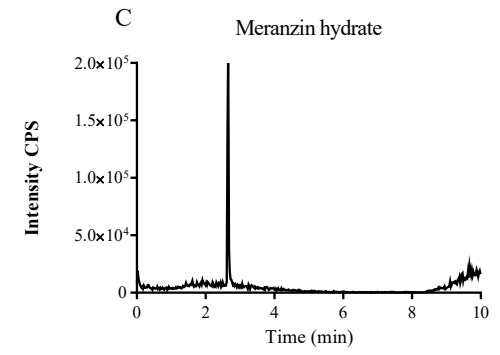
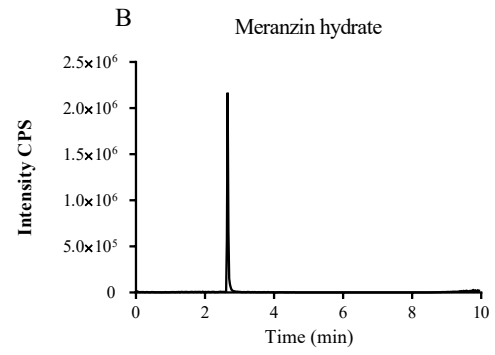
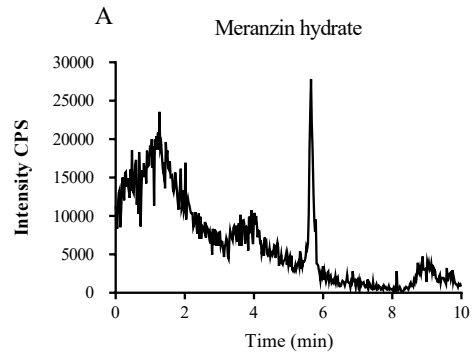
Figure. 1 The product spectra of the twelve analytes and Paracetamol (IS) in electrospray ionization mode by QQQ-MS/MS











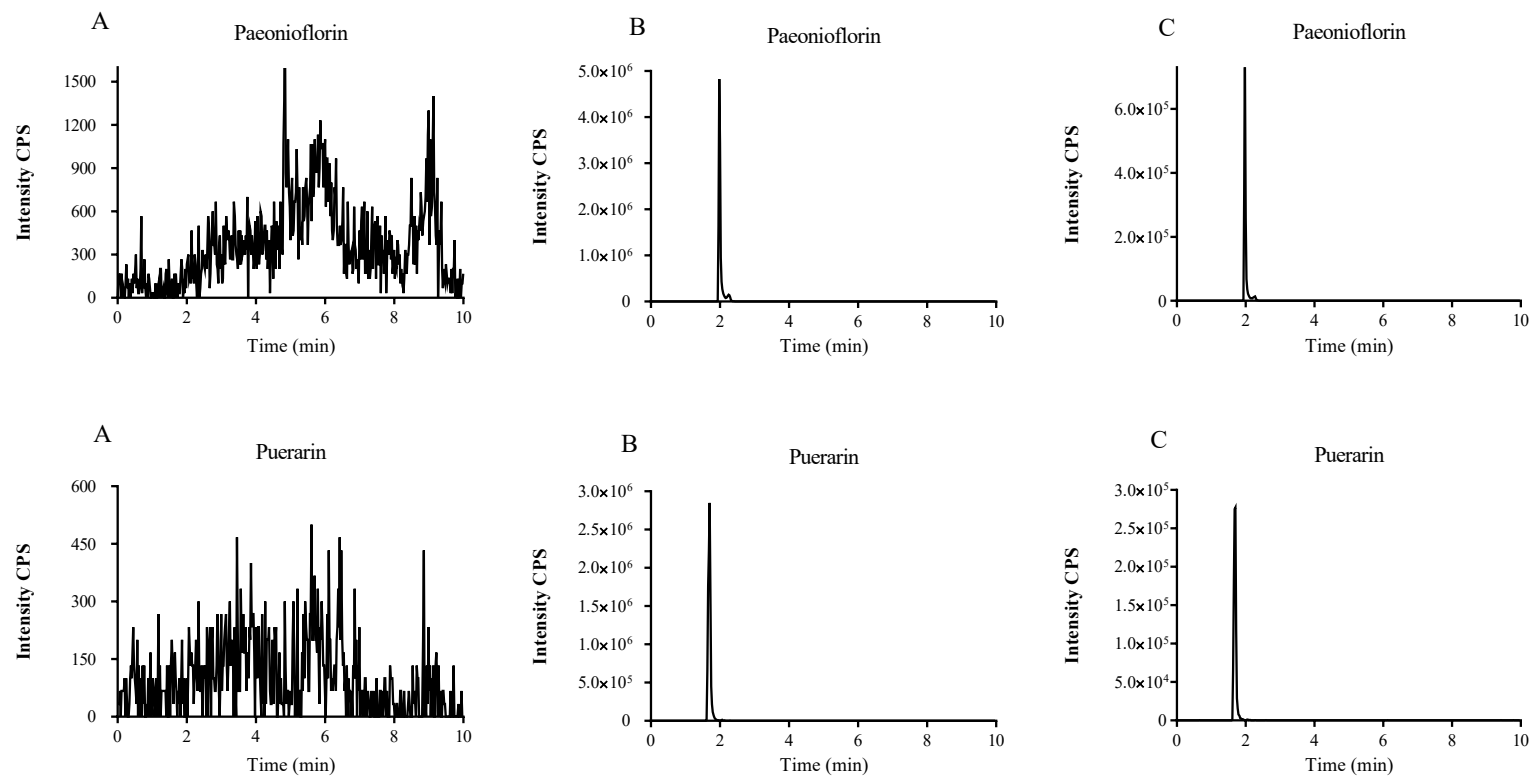


Figure 2 Typical MRM chromatograms of (A) blank plasma; (B) blank plasma sample spiked with twelve analytes and (C) Rat plasma samples at 30 min after oral administration of 30 g/kg XYSJW

Table.1 Comparison of behavior differences in force swimming test and open field test ($\bar{x} \pm s$, n =6)

| Group | Immobility time(s) | Locomotion (times) | Rearing (times) | Grooming (times) |
|---------|--------------------|--------------------|-----------------|------------------|
| Control | 185.56±5.46 | 117.5±5.04 | 22.50±1.37 | 8.00±1.79 |
| Model | 240.78±8.64** | 105.50±10.71 | 13.70±2.94** | 3.20±1.17** |

**P <0.01 vs Control

Table 2 UFLC-Q-TOF-MS/MS identification of XYSJW in negative mode

| No. | T _R (min) | Identificaton | Molecular Formula | Ion species | Theoretical Mass (Da) | Measured Mass (Da) | Mass Accuracy (ppm) | MS/MS Fragments Ions | Reference |
|-----|----------------------|-----------------------------|---|-----------------------|-----------------------|--------------------|---------------------|---------------------------------------|-----------|
| 1 | 0.57 | Histidine | C ₆ H ₉ N ₃ O ₂ | [M-H] ⁻ | 154.0622 | 154.0635 | 8.4 | 154.0637 | 1, 2 |
| 2 | 0.6 | Adenosine | C ₁₀ H ₁₃ N ₅ O ₄ | [M-H] ⁻ | 266.0895 | 266.0886 | -3.3 | 266.0883 | 1, 2 |
| 3 | 0.62 | Methose | C ₆ H ₁₂ O ₆ | [M-H] ⁻ | 179.0561 | 179.0569 | 4.5 | 179.0571 | 3 |
| 4 | 0.63 | α-D-Galactopyranuronic acid | C ₆ H ₁₀ O ₇ | [M-H] ⁻ | 193.0354 | 193.0363 | 4.6 | 193.03627 | 3 |
| 5 | 0.67 | sucrose | C ₁₂ H ₂₂ O ₁₁ | [M-H] ⁻ | 341.1089 | 341.1093 | 1.2 | 179.0558, 119.0355, 113.0247, 89.0256 | 4,5 |
| 6 | 1.25 | Riboflavin | C ₁₇ H ₂₀ N ₄ O ₆ | [M+COOH] ⁻ | 421.1354 | 421.1354 | 0 | 375.1295, 345.1197, 165.0556, | 3 |

| | | | | | | | | | |
|----|------|---|---|--------------------|----------|----------|---------|--|--------|
| | | | | | | | 89.0259 | | |
| 7 | 1.31 | Uridine | C ₉ H ₁₂ N ₂ O ₆ | [M-H] ⁻ | 243.0623 | 243.0630 | 3.1 | 169.0178, 124.0172 | 6 |
| 8 | 2.02 | Gallic acid | C ₇ H ₆ O ₅ | [M-H] ⁻ | 169.0143 | 169.0155 | 7.6 | 125.0233, 79.0202 | 4,5 |
| 9 | 2.1 | Guanosine | C ₁₀ H ₁₃ N ₅ O ₅ | [M-H] ⁻ | 282.0844 | 282.0847 | 1.2 | 150.0418, 133.0156, 108.0207 | 1,2 |
| 10 | 2.32 | Adenosine cyclic 3',5'- monophosphate | C ₁₀ H ₁₂ N ₅ O ₆ P | [M-H] ⁻ | 328.0453 | 328.0455 | 0.9 | 134.0472, 78.9600 | 3 |
| 11 | 2.53 | Phenylalanine | C ₉ H ₁₁ NO ₂ | [M-H] ⁻ | 164.0717 | 164.0731 | 8.7 | 147.0441, 103.0554, 72.0108 | 7 |
| 12 | 3.48 | Ethyl gallate | C ₉ H ₁₀ O ₅ | [M-H] ⁻ | 197.0456 | 197.0465 | 4.8 | 179.0350, 135.0451, 123.0453, 72.9959 | 4,5 |
| 13 | 4.32 | shanzhiside | C ₁₆ H ₂₄ O ₁₁ | [M-H] ⁻ | 391.1246 | 391.1247 | 0.4 | 229.0723, 59.0170 | 8 |
| 14 | 4.42 | Geniposidic acid | C ₁₆ H ₂₂ O ₁₀ | [M-H] ⁻ | 373.1140 | 373.1143 | 0.6 | 211.0602, 167.0701, 149.0601, 123.0447 | 8 |
| 15 | 5.34 | Gardenoside | C ₁₇ H ₂₄ O ₁₁ | [M-H] ⁻ | 403.1246 | 403.1248 | 0.5 | 241.0720, 127.0402 | 8 |
| 16 | 5.41 | D-(+)-Mannose | C ₆ H ₁₂ O ₆ | [M-H] ⁻ | 179.0561 | 179.0569 | 4.5 | 135.0401 | 6 |
| 17 | 5.47 | Licoricone | C ₂₂ H ₂₂ O ₆ | [M-H] ⁻ | 381.1344 | 381.1330 | -3.7 | 345.1584, 179.0562, 165.0923 | 12 |
| 18 | 5.76 | [5-(Hexopyranosyloxy)-1- oxo-2a,4a,5,7b- tetrahydro-1H-2,6- dioxacyclopenta[cd]inden- 4-yl]methyl acetate | C ₁₈ H ₂₂ O ₁₁ | [M-H] ⁻ | 413.1089 | 413.1093 | 0.9 | 233.0450, 125.0243, | 8 |
| 19 | 5.88 | Paeonol | C ₉ H ₁₀ O ₃ | [M-H] ⁻ | 165.0557 | 165.0568 | 6.2 | 121.0644, 119.0494, 90.346, 59.0165 | 18,19 |
| 20 | 5.92 | 3-Hydroxy-4- methoxyacetophenone | C ₉ H ₁₀ O ₃ | [M-H] ⁻ | 165.0557 | 165.0568 | 6.2 | 121.0644, 93.0346. 59.0165 | 9,10 |
| 21 | 6.23 | Methyl gallate | C ₈ H ₈ O ₅ | [M-H] ⁻ | 183.0299 | 183.0306 | 4 | 124.0157, 78.0127 | 3,4 |
| 22 | 6.79 | Uralenneoside | C ₁₂ H ₁₄ O ₈ | [M-H] ⁻ | 285.0616 | 285.0619 | 1.1 | 153.0183, 109.0297 | 11, 12 |
| 23 | 6.98 | Catechin | C ₁₅ H ₁₄ O ₆ | [M-H] ⁻ | 289.0718 | 289.0722 | 1.6 | 245.08205, 203.0699, 159.0438, 123.0454, 109.0300 | 4,5 |
| 24 | 7.01 | Methyl nicotinate | C ₇ H ₇ NO ₂ | [M-H] ⁻ | 136.0465 | 136.0467 | 0.5 | 136.0429, 92.0523 | 3 |
| 25 | 7.22 | Phthalic acid | C ₈ H ₆ O ₄ | [M-H] ⁻ | 165.0193 | 165.0200 | 3.8 | 121.0280, 77.0403 | 1,2 |
| 26 | 7.38 | Chlorogenic acid | C ₁₆ H ₁₈ O ₉ | [M-H] ⁻ | 353.0878 | 353.0880 | 0.6 | 191.0552 | 8 |
| 27 | 7.61 | oxypaeoniflorin | C ₂₃ H ₂₈ O ₁₂ | [M-H] ⁻ | 495.1508 | 495.1504 | -0.9 | 465.1399, 333.0974, 165.0550, 137.0236 | 9,10 |
| 28 | 7.68 | Vanillic acid | C ₈ H ₈ O ₄ | [M-H] ⁻ | 167.0350 | 167.0357 | 4.4 | 152.0102, 108.0229, 65.0045 | 9,10 |
| 29 | 8.59 | Narcissin | C ₂₈ H ₃₂ O ₁₆ | [M-H] ⁻ | 623.1618 | 623.1618 | 0 | 415.1030, 252.0423 | 13 |

| | | | | | | | | | |
|----|--------|----------------------------------|---|-----------------------|----------|----------|------|--|--------|
| 30 | 9 | Paeonoside | C ₁₅ H ₂₀ O ₈ | [M-H] ⁻ | 327.1085 | 327.1088 | 0.9 | 147.0440, 103.0573 | 4,5 |
| 31 | 9.49 | Nuciferin | C ₁₉ H ₂₁ NO ₂ | [M+COOH] ⁻ | 340.1543 | 340.1548 | 1.3 | 325.1322, 310.1082, 252.0422, 224.0475 | 3 |
| 32 | 9.77 | Zizybeoside I | C ₁₉ H ₂₈ O ₁₁ | [M+COOH] ⁻ | 477.1603 | 477.1608 | 1.1 | 183.0655, 168.0425, 161.0450, 153.0189 | 3 |
| 33 | 10.47 | Genipin | C ₁₁ H ₁₄ O ₅ | [M-H] ⁻ | 225.0769 | 225.0769 | 0.4 | 210.0494, 180.0431, 165.0181, 137.0228 | 8 |
| 34 | 10.47 | Geniposide | C ₁₇ H ₂₄ O ₁₀ | [M-H] ⁻ | 387.1297 | 387.1293 | -0.9 | 355.1092, 225.0759, 207.0651, 147.0451, 123.0446, 101.0250 | 8 |
| 35 | 10.85 | Indole-3-acetic acid | C ₁₀ H ₉ NO ₂ | [M-H] ⁻ | 174.0561 | 174.0568 | 4.4 | 159.0317, 145.0526, 131.0379 | 3 |
| 36 | 10.99 | Paeonolide | C ₂₀ H ₂₈ O ₁₂ | +COOH | 505.1552 | 505.1556 | -11 | 293.0878, 165.0553, 150.0321 | 11, 12 |
| 37 | 11.09 | Magnoflorine | C ₂₀ H ₂₄ NO ₄ | +COOH | 387.1676 | 387.1660 | -4.2 | 207.1018, 89.0254, 59.0172 | 18 |
| 38 | 11.52 | Puerarin | C ₂₁ H ₂₀ O ₉ | [M-H] ⁻ | 415.1035 | 415.1032 | -0.7 | 295.0594, 277.0594, 267.0647 | 13 |
| 39 | 11.59 | Uralenol | C ₂₀ H ₁₈ O ₇ | [M+COOH] ⁻ | 415.1024 | 415.1032 | 1.9 | 295.0606, 277.0506, 267.0652, | 11, 12 |
| 40 | 11.67 | Neouralenol | C ₂₀ H ₁₈ O ₇ | [M+COOH] ⁻ | 415.1024 | 415.1032 | 1.9 | 295.0606, 277.0506, 267.0652, | 11, 12 |
| 41 | 11.694 | Albiflorin | C ₂₃ H ₂₈ O ₁₁ | [M-H] ⁻ | 479.1559 | 479.1554 | -1.1 | 449.1462, 327.1076, 121.0288 | 4,5 |
| 42 | 12.23 | Apiopaeonoside | C ₂₀ H ₂₈ O ₁₂ | [M+COOH] ⁻ | 505.1552 | 505.1556 | -1 | 459.1499, 293.0870, 165.0552 | 9,10 |
| 43 | 13.21 | Zizyvoside I | C ₂₅ H ₄₀ O ₁₂ | [M+COOH] ⁻ | 577.2491 | 577.2496 | 1 | 531.2471, 385.1844, 205.1223, 153.0923 | 3 |
| 44 | 13.31 | albiflorin R1 | C ₂₃ H ₂₈ O ₁₁ | [M-H] ⁻ | 479.1559 | 479.1554 | -1.1 | 449.1462, 327.1076, 121.0288 | 4,5 |
| 45 | 13.49 | paeoniflorin | C ₂₃ H ₂₈ O ₁₁ | [M-H] ⁻ | 479.1559 | 479.1554 | -1.1 | 327.1109, 121.0289 | 9,10 |
| 46 | 14.18 | Nicotiflorin | C ₂₇ H ₃₀ O ₁₅ | [M-H] ⁻ | 593.1512 | 593.1510 | -0.4 | 503.1214, 473.1103, 383.0776, 353.0667, 297.0769 | 11, 12 |
| 47 | 14.95 | Galloxyloypaeoniflorin | C ₃₀ H ₃₂ O ₁₆ | [M-H] ⁻ | 647.1618 | 647.1616 | -0.3 | 629.1552, 491.1221, 313.0577, 271.0465, 169.0142 | 9,10 |
| 48 | 16.11 | Catechin 5-O-β-D-glucopyranoside | C ₂₁ H ₂₄ O ₁₁ | [M+COOH] ⁻ | 497.1290 | 497.1292 | 0.5 | 353.0879, 335.0974, 191.0550, 161.0444 | 3 |
| 49 | 16.92 | Neoliquiritin | C ₂₁ H ₂₂ O ₉ | [M-H] ⁻ | 417.1191 | 417.1190 | -0.3 | 255.0660, 135.0083, 119.0500 | 11, 12 |
| 50 | 17.31 | Liquiritin | C ₂₁ H ₂₂ O ₉ | [M-H] ⁻ | 417.1191 | 417.1190 | -0.3 | 255.0683, 135.0076, 119.0496 | 12 |
| 51 | 18.31 | Rutin | C ₂₇ H ₃₀ O ₁₆ | [M-H] ⁻ | 609.1461 | 609.1455 | -1 | 301.0352, 300.0271, 271.0234, 255.0300 | 13 |
| 52 | 18.38 | Rosoliside | C ₁₇ H ₂₀ O ₈ | [M+COOH] ⁻ | 397.1140 | 397.1142 | 0.9 | 235.0607, 217.0499, 191.0707, 176.0466, 161.0238 | 4,5 |
| 53 | 18.64 | Isoquercitrin | C ₂₁ H ₂₀ O ₁₂ | [M-H] ⁻ | 463.0882 | 463.0877 | -1.1 | 301.0349, 300.0272, 271.0238, 255.0295 | 8 |

| | | | | | | | | | |
|----|--------|-----------------------------|---|-----------------------|-----------|-----------|------|--|--------|
| 54 | 18.7 | Isorhamnetin-3-O-glucoside | C ₂₂ H ₂₂ O ₁₂ | [M-H] ⁻ | 477.1039 | 477.1033 | -1.2 | 431.2304, 341.0681, 161.0240 | 13 |
| 55 | 18.88 | Galloylpaeoniflorin | C ₃₀ H ₃₂ O ₁₅ | [M-H] ⁻ | 631.1668 | 631.1664 | -0.7 | 595.1684, 565.1423, 313.0564, 169.0141 | 5 |
| 56 | 20.15 | Azelaic acid | C ₉ H ₁₆ O ₄ | [M-H] ⁻ | 187.0976 | 187.0978 | 1 | 169.0860, 125.0962, 97.0660 | 1.2 |
| 57 | 20.3 | Narirutin | C ₂₇ H ₃₂ O ₁₄ | [M-H] ⁻ | 579.1719 | 579.1714 | -0.9 | 295.0607, 271.0500, 151.0028 | 3 |
| 58 | 20.8 | Mudanpioside H | C ₃₀ H ₃₂ O ₁₄ | [M-H] ⁻ | 615.1719 | 615.1714 | -0.9 | 431.1347, 281.0659, 137.0236 | 9,10 |
| 59 | 20.82 | Astragalin | C ₂₁ H ₂₀ O ₁₁ | [M-H] ⁻ | 447.0933 | 447.0925 | -1.8 | 285.0392, 255.0295, 227.0340 | 4,5 |
| 60 | 21.2 | Naringin | C ₂₇ H ₃₂ O ₁₄ | [M-H] ⁻ | 579.1719 | 579.1714 | -0.9 | 271.0596, 151.0028 | 15, 16 |
| 61 | 21.85 | Daidzein-4,7-diglucoside | C ₂₇ H ₃₀ O ₁₄ | [M-H] ⁻ | 577.1563 | 577.1558 | -0.8 | 577.1558, 269.0443 | 14 |
| 62 | 21.973 | Paeoniflorin | C ₂₃ H ₂₈ O ₁₁ | [M-H] ⁻ | 479.1559 | 479.1554 | -1.1 | 121.0295 | 4,5 |
| 63 | 22.11 | Hesperidin | C ₂₈ H ₃₄ O ₁₅ | [M-H] ⁻ | 609.1825 | 609.1819 | -1 | 609.1521, 301.0692 | 15, 16 |
| 64 | 22.27 | Rosmarinic acid | C ₁₈ H ₁₆ O ₈ | [M-H] ⁻ | 359.0772 | 359.0767 | -1.4 | 197.0445, 179.0341, 161.0234, 133.0287 | 7 |
| 65 | 22.34 | Spinosin | C ₂₈ H ₃₂ O ₁₅ | [M-H] ⁻ | 607.1668 | 607.1663 | -0.9 | 229.0546, 284.0315 | 3 |
| 66 | 22.44 | Isochlorogenic acid C | C ₂₅ H ₂₄ O ₁₂ | [M-H] ⁻ | 515.1195 | 515.1185 | -1.9 | 353.0876, 191.0558, 179.0347, 173.0452, 135.0444 | 8 |
| 67 | 22.71 | 3,5-O-dicaffeoylquinic acid | C ₂₅ H ₂₄ O ₁₂ | [M-H] ⁻ | 515.1195 | 515.1185 | -1.9 | 353.0871, 335.745, 191.0554, 179.0340, 135.0442 | 8 |
| 68 | 22.82 | Bupleuroside XII | C ₄₈ H ₇₈ O ₁₉ | [M+COOH] ⁻ | 1003.5108 | 1003.5118 | 0.9 | 957.5811, 811.4534, 651.2732 | 13 |
| 69 | 23.01 | Neohesperidin | C ₂₈ H ₃₄ O ₁₅ | [M-H] ⁻ | 609.1825 | 609.1819 | -1 | 489.1402, 343.0812, 301.0691 | 15, 16 |
| 70 | 23.05 | Myristicin | C ₁₁ H ₁₂ O ₃ | [M+COOH] ⁻ | 237.0758 | 237.0768 | 4.4 | 193.0856, 108.0211 | 3 |
| 71 | 23.57 | 4',7-Dihydroxyflavone | C ₁₅ H ₁₀ O ₄ | [M-H] ⁻ | 253.0506 | 253.0510 | 1.5 | 223.0398, 133.0277, 117.0341 | 8 |
| 72 | 23.8 | Isoliquiritigenin | C ₁₅ H ₁₂ O ₄ | [M-H] ⁻ | 255.0663 | 255.0665 | 0.4 | 135.0078, 119.0500, 91.0195 | 11, 12 |
| 73 | 23.84 | Ononin | C ₂₂ H ₂₂ O ₉ | [M+COOH] ⁻ | 475.1235 | 475.1238 | 0.7 | 267.0658, 252.0422 | 14 |
| 74 | 23.95 | Daidzein | C ₁₅ H ₁₀ O ₄ | [M-H] ⁻ | 253.0506 | 253.0510 | 1.5 | 233.0388, 208.0522 | 14 |
| 75 | 24.05 | Chrysin | C ₁₅ H ₁₀ O ₄ | [M-H] ⁻ | 253.0506 | 253.0510 | 1.5 | 225.0542, 223.0388, 195.0444 | 8 |
| 76 | 24.06 | Isoliquiritin | C ₂₁ H ₂₂ O ₉ | [M-H] ⁻ | 417.1191 | 417.1190 | -0.3 | 255.0643, 148.0158, 135.0079, 119.0496 | 11, 12 |
| 77 | 24.32 | Vulgarin | C ₁₅ H ₂₀ O ₄ | [M-H] ⁻ | 263.1289 | 263.1291 | 0.9 | 219.1378, 204.1157, 203.1079, 154.0834 | 3 |
| 78 | 25.58 | Sebacic acid | C ₁₀ H ₁₈ O ₄ | [M-H] ⁻ | 201.1132 | 201.1134 | 1 | 183.1003, 139.1115 | 1,2 |
| 79 | 26.2 | kaempferol | C ₁₅ H ₁₀ O ₆ | [M-H] ⁻ | 285.0405 | 285.0403 | -0.5 | 175.0384, 133.0296 | 4,5 |

| | | | | | | | | | |
|-----|--------|-----------------------------|--|-----------------------|-----------|-----------|------|--|--------|
| 80 | 26.39 | Sacranoside A | C ₂₁ H ₃₄ O ₁₀ | [M-H] ⁻ | 445.2079 | 445.2076 | -0.7 | 293.0879, 141.0886 | 4,5 |
| 81 | 26.69 | Marmin | C ₁₉ H ₂₄ O ₅ | [M-H] ⁻ | 331.1551 | 331.1549 | -0.7 | 331.1547, 115.0702 | 15, 16 |
| 82 | 27.3 | Nornuciferine | C ₁₈ H ₁₉ NO ₂ | [M+COOH] ⁻ | 326.1387 | 326.1393 | 1.8 | 311.1170, 204.0652, 148.0513, 135.0446 | 3 |
| 83 | 28.66 | Naringenin | C ₁₅ H ₁₂ O ₅ | [M-H] ⁻ | 271.0612 | 271.0613 | 0.3 | 187.0391, 177.0184, 151.0028, 119.0499 | 15, 16 |
| 84 | 29.01 | Genistein | C ₁₅ H ₁₀ O ₅ | [M-H] ⁻ | 269.0456 | 269.0457 | 0.6 | 133.0296 | 14 |
| 85 | 29.01 | 7,8,4'-trihydroxyisoflavone | C ₁₅ H ₁₀ O ₅ | [M-H] ⁻ | 269.0456 | 269.0457 | 0.6 | 269.0453, 133.0296 | 14 |
| 86 | 29.76 | 6-gingediol-3-acetate | C ₁₉ H ₃₀ O ₅ | [M-H] ⁻ | 337.2021 | 337.2014 | -1.9 | 337.2021 | 18 |
| 87 | 29.86 | Coumesterol | C ₁₅ H ₈ O ₅ | [M-H] ⁻ | 267.0299 | 267.0296 | -1 | 267.0964, 195.0442 | 3 |
| 88 | 29.91 | 6-gingediol-5-acetate | C ₁₉ H ₃₀ O ₅ | [M-H] ⁻ | 337.2021 | 337.2014 | -1.9 | 337.2026 | 18 |
| 89 | 30.41 | Paeonidanin | C ₂₅ H ₃₂ O ₁₀ | [M-H] ⁻ | 491.1923 | 491.1913 | -1.9 | 413.1603, 353.1386, 217.0865 | 9,10 |
| 90 | 30.73 | Hesperetin | C ₁₆ H ₁₄ O ₆ | [M-H] ⁻ | 301.0718 | 301.0717 | -0.3 | 286.0469, 199.0386, 164.0106, 151.0026, 136.0157 | 15, 16 |
| 91 | 30.9 | benzoylpaeoniflorin | C ₃₀ H ₃₂ O ₁₂ | [M-H] ⁻ | 583.1821 | 583.1822 | 0.2 | 553.1648, 121.0266 | 9,10 |
| 92 | 31.52 | Isorhamnetin | C ₁₆ H ₁₂ O ₇ | [M-H] ⁻ | 315.0510 | 315.0507 | -1 | 315.0508 | 13 |
| 93 | 31.52 | Sexangularetin | C ₁₆ H ₁₂ O ₇ | [M-H] ⁻ | 315.0510 | 315.0507 | -1 | 315.0509 | 18 |
| 94 | 33.54 | 6-gingesulfonic acid | C ₁₇ H ₂₆ O ₆ S | [M-H] ⁻ | 357.1377 | 357.1367 | -3 | 275.1635, 139.1115, 80.9661 | 18 |
| 95 | 33.596 | Liquiritigenin | C ₁₅ H ₁₂ O ₄ | [M-H] ⁻ | 255.0663 | 255.0663 | 0.2 | 135.0092, 119.0486 | 11, 12 |
| 96 | 34.09 | Formonetin | C ₁₆ H ₁₂ O ₄ | [M-H] ⁻ | 267.0663 | 267.0660 | -1.1 | 252.0409, 233.0375, 195.0430 | 14 |
| 97 | 34.54 | Zizyphus saponin III | C ₅₂ H ₈₄ O ₂₁ | [M-H] ⁻ | 1043.5432 | 1043.5409 | -2.2 | 1043.5408 | 3 |
| 98 | 35.64 | Gardenone | C ₁₂ H ₂₀ O ₃ | [M-H] ⁻ | 211.1340 | 211.1330 | -4.4 | 211.1351 | 6 |
| 99 | 39.65 | Saikosaponin B3 | C ₄₃ H ₇₂ O ₁₄ | [M+COOH] ⁻ | 857.4893 | 857.4896 | 0.3 | 811.4869, 649.4257 | 13 |
| 100 | 39.72 | 3'-Methoxydaidzein | C ₁₆ H ₁₂ O ₅ | [M-H] ⁻ | 283.0612 | 283.0614 | 0.6 | 268.0359, 211.0378 | 14 |
| 101 | 39.92 | Nortrachelogenin | C ₂₀ H ₂₂ O ₇ | [M-H] ⁻ | 373.1293 | 373.1308 | 4 | 273.0432, 193.0861, 79.9587 | 13 |
| 102 | 39.94 | 6-Gingerol | C ₁₇ H ₂₆ O ₄ | [M-H] ⁻ | 293.1758 | 293.1755 | -1.1 | 99.0800, 57.0366 | 18 |
| 103 | 40.53 | Imperatorin | C ₁₆ H ₁₄ O ₄ | [M-H] ⁻ | 269.0819 | 269.0819 | -0.2 | 269.0808, 152.0105 | 8 |
| 104 | 40.53 | isoimperatorin | C ₁₆ H ₁₄ O ₄ | [M-H] ⁻ | 269.0819 | 269.0819 | -0.2 | 269.08058, 152.0105 | 8 |
| 105 | 40.65 | Glycyrrhizic acid | C ₄₂ H ₆₂ O ₁₆ | [M-H] ⁻ | 821.3965 | 821.3955 | -1.2 | 423,0104, 405.0689 | 11, 12 |
| 106 | 41.03 | Saikosaponin B4 | C ₄₃ H ₇₂ O ₁₄ | [M+COOH] ⁻ | 857.4893 | 857.4896 | 0.3 | 811.4866, 649.4254 | 13 |
| 107 | 41.84 | Saikosaponin A | C ₄₂ H ₆₈ O ₁₃ | [M-H] ⁻ | 779.4587 | 779.4581 | -0.8 | 617.4098 | 13 |
| 108 | 42.11 | Saikosaponin D | C ₄₂ H ₆₈ O ₁₃ | [M-H] ⁻ | 779.4587 | 779.4572 | -1.6 | 617.4074 | 13 |
| 109 | 42.21 | Sigmoidin B | C ₂₀ H ₂₀ O ₆ | [M-H] ⁻ | 355.1187 | 355.1185 | -0.6 | 229.0866, 125.0239 | 11, 12 |

| | | | | | | | | | |
|-----|--------|--------------------------|---|-----------------------|----------|----------|-------|---|--------|
| 110 | 42.26 | Zizyphus saponin II | C ₄₇ H ₇₆ O ₁₇ | [M-H] ⁻ | 911.5010 | 911.4991 | -2 | 911.5096 | 17 |
| 111 | 42.41 | Bupleuroside I | C ₄₈ H ₇₈ O ₁₈ | [M-H] ⁻ | 941.5115 | 941.5098 | -1.8 | 941.5181 | 13 |
| 112 | 42.41 | Jujubasaponin V | C ₄₈ H ₇₈ O ₁₈ | [M+COOH] ⁻ | 987.5159 | 987.5151 | -0.8 | 941.5153 | 3 |
| 113 | 42.58 | Isokaerophyllin | C ₂₁ H ₂₀ O ₆ | [M-H] ⁻ | 367.1187 | 367.1177 | -2.9 | 309.0398, 298.0398, 281.045,171.0181 | 13 |
| 114 | 42.58 | Curcumin | C ₂₁ H ₂₀ O ₆ | [M-H] ⁻ | 367.1187 | 367.1177 | -2.9 | 309.0391,297.392, 201.0174 | 18 |
| 115 | 43.01 | Jujubasaponin VI | C ₄₂ H ₆₈ O ₁₄ | [M-H] ⁻ | 795.4536 | 795.4521 | -2 | 795.4777, 311.2278 | 3 |
| 116 | 43.033 | Saikosaponin B1 | C ₄₂ H ₆₈ O ₁₃ | [M-H] ⁻ | 779.4587 | 779.4569 | -0.8 | 617.4092 | 13 |
| 117 | 43.06 | Zizyphus saponin I | C ₄₇ H ₇₆ O ₁₇ | [M-H] ⁻ | 911.5010 | 911.4991 | -2 | 911.5013 | 3 |
| 118 | 43.374 | Saikosaponin B2 | C ₄₂ H ₆₈ O ₁₃ | [M-H] ⁻ | 779.4587 | 779.4581 | -0.8 | 617.4093 | 13 |
| 119 | 43.42 | jujubasaponin IV | C ₄₈ H ₇₈ O ₁₈ | [M-H] ⁻ | 941.5115 | 941.5098 | -1.8 | 941.5194 | 3 |
| 120 | 43.43 | Saikosaponin C | C ₄₈ H ₇₈ O ₁₇ | [M-H] ⁻ | 925.5166 | 925.5153 | -1.5 | 925.5182, 907.5061 | 13 |
| 121 | 43.44 | Isogingerenone-B | C ₂₂ H ₂₆ O ₆ | [M-H] ⁻ | 385.1657 | 385.1671 | 3.6 | 303.1970, 167.1423, 80.9659 | 18 |
| 122 | 43.63 | Bupleuroside X | C ₄₈ H ₇₈ O ₁₈ | [M-H] ⁻ | 941.5115 | 941.5099 | -1.7 | 895.3392, 941.5095 | 13 |
| 123 | 44.06 | Saikosaponin E | C ₄₂ H ₆₈ O ₁₂ | [M-H] ⁻ | 763.4638 | 763.4624 | -1.9 | 601.3964, 161.0418, 101.0233 | 13 |
| 124 | 44.51 | saikosaponin H | C ₄₈ H ₇₈ O ₁₇ | [M-H] ⁻ | 925.5166 | 925.5159 | -1.2 | 925.5161 | 13 |
| 125 | 44.61 | Bupleuroside VII | C ₄₈ H ₇₈ O ₁₈ | [M-H] ⁻ | 941.5115 | 941.5101 | -0.9 | 941.5116 | 13 |
| 126 | 45.11 | poricoic acid A | C ₃₁ H ₄₆ O ₅ | [M-H] ⁻ | 497.3273 | 497.3250 | -4.5 | 497.3251, 419.2971 | 19, 20 |
| 127 | 45.2 | Glycyrol | C ₂₁ H ₁₈ O ₆ | [M-H] ⁻ | 365.1031 | 365.1017 | -3.9 | 365.1023 | 19, 20 |
| 128 | 46.1 | Honokiol | C ₁₈ H ₁₈ O ₂ | [M-H] ⁻ | 265.1234 | 265.1229 | -2.2 | 249.0910, 223.751, 197.0597 | 17 |
| 129 | 47.48 | Obovatol | C ₁₈ H ₁₈ O ₃ | [M-H] ⁻ | 281.1183 | 281.1177 | -2.2 | 281.1166, 164.0468 | 17 |
| 130 | 47.63 | Magnolol | C ₁₈ H ₁₈ O ₂ | [M-H] ⁻ | 265.1234 | 265.1227 | -2.6 | 247.110[17, 18]45.0952, 243.0803, 223.0747 | 17 |
| 131 | 47.65 | vomifoliol | C ₁₃ H ₂₀ O ₃ | [M+COOH] ⁻ | 269.1384 | 269.1329 | -20.4 | 251.1964, 171.0989 | 17 |
| 132 | 48.1 | Iso-Glycyrol | C ₂₁ H ₁₈ O ₆ | [M-H] ⁻ | 365.1031 | 365.1029 | -0.9 | 365.1028 | 11, 12 |
| 133 | 48.26 | poricoic acid C | C ₃₁ H ₄₆ O ₄ | [M-H] ⁻ | 481.3323 | 481.3291 | -6.8 | 466.3084, 253.2181 | 19, 20 |
| 134 | 48.37 | Poricoic acid B | C ₃₀ H ₄₄ O ₅ | [M-H] ⁻ | 483.3116 | 483.3087 | -6 | 409.2744, 255.2365 | 19, 20 |
| 135 | 48.41 | 6-Gingerdione | C ₁₇ H ₂₄ O ₄ | [M-H] ⁻ | 291.1602 | 291.1592 | -3.5 | 231.1362, 59.0167 | 19, 20 |
| 136 | 48.54 | 2α-hydroxyoleanolic acid | C ₃₀ H ₄₈ O ₄ | [M+COOH] ⁻ | 517.3524 | 517.3507 | -3.3 | 471.3489 | 3 |
| 137 | 48.58 | Jujubogenin | C ₃₀ H ₄₈ O ₄ | [M+COOH] ⁻ | 517.3524 | 517.3506 | -3.3 | 471.3461 | 3 |
| 138 | 48.61 | 3-Epicorosolic acid | C ₃₀ H ₄₈ O ₄ | [M+COOH] ⁻ | 517.3524 | 517.3506 | -3.3 | 471.3492 | 3 |
| 139 | 48.91 | Tumulolic acid | C ₃₁ H ₅₀ O ₄ | [M-H] ⁻ | 485.3636 | 485.3604 | -6.6 | 485.3637, 419.0955 | 19, 20 |
| 140 | 49.20 | Maslinic acid | C ₃₀ H ₄₈ O ₄ | [M+COOH] ⁻ | 517.3524 | 517.3506 | -3.3 | 471.3487 | 3 |

| | | | | | | | | | |
|-----|-------|--------------------------|--|-----------------------|----------|----------|------|---|--------|
| 141 | 49.57 | Glycyrrhetic acid | C ₃₀ H ₄₆ O ₄ | [M-H] ⁻ | 469.3323 | 469.3297 | -5.6 | 469.329, 425.3416 | 11, 12 |
| 142 | 50.94 | dehydroeburicoic acid | C ₃₁ H ₄₈ O ₃ | [M+COOH] ⁻ | 513.3575 | 513.3560 | -2.9 | 495.3290, 467. 2960 | 19, 20 |
| 143 | 51.23 | Mairin | C ₃₀ H ₄₈ O ₃ | [M-H] ⁻ | 455.3531 | 455.3500 | -6.7 | 455.3509 | 3 |
| 144 | 51.4 | pachymic acid | C ₃₃ H ₅₂ O ₅ | [M-H] ⁻ | 527.3742 | 527.3711 | -5.9 | 527.3729 | 19, 20 |
| 145 | 51.55 | Oleanolic acid | C ₃₀ H ₄₈ O ₃ | [M-H] ⁻ | 455.3531 | 455.3499 | -6.8 | 455.3509 | 3 |
| 146 | 52.04 | Alfalone | C ₁₇ H ₁₄ O ₅ | [M+COOH] ⁻ | 343.0804 | 453.3343 | -7 | 328.0564, 313.0337, 259.0607, 131.0634 | 3 |
| 147 | 52.08 | Mudanpinoic acid A | C ₃₀ H ₄₆ O ₃ | [M-H] ⁻ | 453.3374 | 453.3343 | -7 | 453.3376 | 9,10 |
| 148 | 52.1 | Dehydrotrametenolic acid | C ₃₀ H ₄₆ O ₃ | [M-H] ⁻ | 453.3374 | 453.3343 | -7 | 453.334 | 18 |
| 149 | 52.15 | Linoleic acid | C ₁₈ H ₃₂ O ₂ | [M-H] ⁻ | 279.2330 | 279.2318 | -4.1 | 279.2299 | 8 |
| 150 | 52.23 | Trametenolic acid | C ₃₀ H ₄₈ O ₃ | [M-H] ⁻ | 455.3531 | 455.3529 | -1.7 | 455.3502 | 19, 20 |
| 151 | 55.93 | Sitogluside | C ₃₅ H ₆₀ O ₆ | [M+COOH] ⁻ | 621.4361 | 621.4336 | -4.1 | 621.4359 | 3 |

Table 3 UFLC-Q-TOF-MS/MS identification of XYSJW in positive mode

| No. | T _R (min) | Identificaton | Molecular Formula | Ion species | Theoretical Mass (Da) | Measured Mass (Da) | Mass Accuracy (ppm) | MS/MS Fragments Ions | reference |
|-----|-------------------------|---------------|---|--------------------|--------------------------|-----------------------|---------------------------|---|-----------|
| 152 | 0.62 | L-(+)-Valine | C ₅ H ₁₁ NO ₂ | [M+H] ⁺ | 118.0863 | 118.0862 | -0.6 | 118.0862, 72.9382 | 1.2 |
| 153 | 0.63 | Glutamine | C ₅ H ₉ NO ₄ | [M+H] ⁺ | 148.0604 | 148.0605 | 0.4 | 148.0606 | 6 |
| 154 | 0.63 | L-Proline | C ₅ H ₉ NO ₂ | [M+H] ⁺ | 116.0706 | 116.0706 | -0.1 | 116.0706 | 3 |
| 155 | 0.67 | Adenine | C ₅ H ₅ N ₅ | [M+H] ⁺ | 136.0618 | 136.0616 | -1.5 | 136.0617, 119.036,82.0270 | 1.2 |
| 156 | 0.98 | Niacin | C ₆ H ₅ NO ₂ | [M+H] ⁺ | 124.0393 | 124.0394 | 0.4 | 124.0393, 78.0376 | 13 |
| 157 | 1.27 | Pyrogallol | C ₆ H ₆ O ₃ | [M+H] ⁺ | 127.039 | 127.0389 | -0.8 | 109.0306, 99.459, 81.0371, 69.0011, 53.0441 | 4,5 |
| 158 | 1.33 | Leucine | C ₆ H ₁₃ NO ₂ | [M+H] ⁺ | 132.1019 | 132.1018 | -1 | 86.0994, 69.0717 | 7 |
| 159 | 1.34 | Uracil | C ₄ H ₄ N ₂ O ₂ | [M+H] ⁺ | 113.0346 | 113.0345 | -0.8 | 96.0102, 70.0328 | 1.2 |
| 160 | 1.35 | Isoleucine | C ₆ H ₁₃ NO ₂ | [M+H] ⁺ | 132.1019 | 132.1018 | -1 | 132.1018, 86.099,79.0747 | 1.2 |
| 8 | 2.01 | Gallic acid | C ₇ H ₆ O ₅ | [M+H] ⁺ | 171.0288 | 171.0286 | -1 | 153.0187, 125.0242, 107.0144, 81.0364 | 9,10 |
| 161 | 2.07 | cGMP | C ₁₀ H ₁₂ N ₅ O ₇ P | [M+H] ⁺ | 346.0547 | 346.0549 | 0.4 | 152.0564, 135.0312 | 3 |

| | | | | | | | | | |
|-----|-------|------------------------------------|---|---------------------|----------|----------|------|---|--------|
| 9 | 2.07 | Guanosine | C ₁₀ H ₁₃ N ₅ O ₅ | [M+H] ⁺ | 284.099 | 284.0994 | 1.4 | 152.0572, 135.0309, 110.0368 | 1.2 |
| 10 | 2.35 | Adenosine cyclic monophosphate | C ₁₀ H ₁₂ N ₅ O ₆ P | [M+H] ⁺ | 330.0598 | 330.0603 | 1.6 | 330.0614, 136.0626 | 3 |
| 11 | 2.57 | Phenylalanine | C ₉ H ₁₁ NO ₂ | [M+H] ⁺ | 166.0863 | 166.0861 | -0.7 | 120.0820, 103.0561, 77.0416 | 1.2 |
| 13 | 4.31 | shanzhiside | C ₁₆ H ₂₄ O ₁₁ | [M+H] ⁺ | 393.1391 | 393.1398 | 1.7 | 309.1831, 195.0662, 149.0599 | 8 |
| 161 | 5.33 | Eugenin | C ₁₁ H ₁₀ O ₄ | [M+H] ⁺ | 207.0652 | 207.0651 | -0.6 | 189.0551, 147.0448, 129.0345, 119.0503, 91.0573 | 13 |
| 162 | 5.33 | Scoparone | C ₁₁ H ₁₀ O ₄ | [M+H] ⁺ | 207.0652 | 207.0651 | -0.6 | 189.0551, 147.0448, 119.0503, 91.0573 | 14 |
| 163 | 6.21 | (S)-(-)-Stepholidine | C ₁₉ H ₂₁ NO ₄ | [M+H] ⁺ | 328.1543 | 328.1546 | 0.9 | 283.0970, 251.0704, 223.0755, 205.0651, 177.0697 | 3 |
| 27 | 7.61 | oxypaeoniflorin | C ₂₃ H ₂₈ O ₁₂ | [M+H] ⁺ | 497.1654 | 497.1656 | 0.5 | 335.1097, 283.0827, 197.0811, 133.0654, 121.0302 | 9,10 |
| 26 | 7.36 | Chlorogenic acid | C ₁₆ H ₁₈ O ₉ | [M+H] ⁺ | 355.1024 | 355.1027 | 0.9 | 163.0399, 145.0291, 135.0449, 117.0347 | 9 |
| 164 | 8.15 | (S)-coclaurine | C ₁₇ H ₁₉ NO ₃ | [M+H] ⁺ | 286.1438 | 286.144 | 0.7 | 269.1188, 175.0758, 107.0508 | 3 |
| 165 | 9.88 | Luteolin-7-glucoside | C ₂₁ H ₂₀ O ₁₁ | [M+Na] ⁺ | 471.0898 | 471.0895 | -0.7 | 471.0909, 351.0462 | 7 |
| 33 | 10.47 | Genipin | C ₁₁ H ₁₄ O ₅ | [M+H] ⁺ | 227.0914 | 227.0913 | -0.3 | 177.0549, 149.0600, 121.0663, 91.0567, 77.0422 | 8 |
| 35 | 10.88 | Indole-3-acetic acid | C ₁₀ H ₉ NO ₂ | [M+H] ⁺ | 176.0706 | 176.0703 | -2 | 148.0752, 133.0531 | 3 |
| 36 | 10.97 | Paeonolide | C ₂₀ H ₂₈ O ₁₂ | [M+Na] ⁺ | 483.1473 | 483.1473 | 0 | 483.1473, 317.0870 | 9,10 |
| 166 | 11.36 | (-)-Isborneol | C ₁₀ H ₁₈ O | [M+H] ⁺ | 155.143 | 155.1428 | -1.4 | 155.14283 | 18 |
| 38 | 11.56 | Puerarin | C ₂₁ H ₂₀ O ₉ | [M+H] ⁺ | 417.118 | 417.1179 | -0.3 | 399.1076, 381.0991, 321.0766, 297.0769, 267.0667 | 14 |
| 43 | 12.26 | Apiopaeonoside | C ₂₀ H ₂₈ O ₁₂ | [M+Na] ⁺ | 483.1473 | 483.1473 | -0.1 | 319.1172, 197.0814, 151.0757, 133.651 | 9,10 |
| 45 | 13.49 | paeoniflorin | C ₂₃ H ₂₈ O ₁₁ | [M+H] ⁺ | 481.1704 | 481.1704 | 0 | 483.1473, 317.0873 | 9,10 |
| 167 | 13.22 | 3-acetyl-4- hydroxybenzoic acid | C ₉ H ₈ O ₄ | [M+H] ⁺ | 181.0495 | 181.0493 | -1.3 | 181.04931, 65.0450 | 9,10 |
| 168 | 13.22 | Caffeic acid | C ₉ H ₈ O ₄ | [M+H] ⁺ | 181.0495 | 181.0493 | -1.3 | 181.0492, 112.5035 | 8 |
| 169 | 13.83 | Asimilobine | C ₁₇ H ₁₇ NO ₂ | [M+H] ⁺ | 268.1332 | 268.1334 | 0.6 | 251.1089.0807, 191.0866, 165.0691 | 3 |
| 170 | 14.1 | Scopoletin | C ₁₀ H ₈ O ₄ | [M+H] ⁺ | 193.0495 | 193.0495 | -0.3 | 178.0263, 150.0325, 133.0286, 122.0361, 184.0430 | 11, 12 |
| 171 | 18.72 | Saikochromoside A | C ₁₇ H ₂₀ O ₁₀ | [M+H] ⁺ | 385.1129 | 385.1132 | 0.7 | 223.0602, 206.0594, 177.0547 | 13 |
| 53 | 18.62 | Isoquercitrin | C ₂₁ H ₂₀ O ₁₂ | [M+H] ⁺ | 465.1028 | 465.1029 | 0.2 | 303.0516, 135.1175 | 6 |
| 60 | 21.21 | Naringin | C ₂₇ H ₃₂ O ₁₄ | [M+H] ⁺ | 581.1865 | 581.1861 | -0.7 | 273.0758, 153.0189 | 15, 16 |
| 172 | 21.65 | Liriodenine | C ₁₇ H ₉ NO ₃ | [M+H] ⁺ | 276.0655 | 276.0657 | 0.5 | 220.0749, 190.0653 | 17 |
| 173 | 21.85 | Lactiflorin | C ₂₃ H ₂₆ O ₁₀ | [M+H] ⁺ | 463.1599 | 463.1579 | -4.2 | 463.1588 | 4,5 |

| | | | | | | | | | |
|-----|--------|---|---|---------------------|----------|----------|------|---|--------|
| 61 | 21.85 | Daidzein-4,7-diglucoside | C ₂₇ H ₃₀ O ₁₄ | [M+H] ⁺ | 579.1708 | 579.171 | 0.3 | 579.1709, 271.0604 | 14 |
| 174 | 21.999 | paeoniflorigenone | C ₁₇ H ₁₈ O ₆ | [M+H] ⁺ | 319.1176 | 319.1179 | 0.9 | 151.0755, 105.034 | 4,5 |
| 63 | 22.11 | Hesperidin | C ₂₈ H ₃₄ O ₁₅ | [M+H] ⁺ | 611.1971 | 611.1971 | 0.2 | 303.0867, 177.0551, 153.0192 | 15, 16 |
| 65 | 22.35 | Spinosin | C ₂₈ H ₃₂ O ₁₅ | [M+H] ⁺ | 609.1814 | 609.1815 | 0.2 | 463.1254, 301.0713 | 13 |
| 175 | 22.54 | Gingerenone C | C ₂₀ H ₂₂ O ₄ | [M+H] ⁺ | 327.1591 | 327.1592 | 0.4 | 163.0760, 137.0605 | 18 |
| 176 | 22.76 | Neryl propanoate | C ₁₃ H ₂₂ O ₂ | [M+H] ⁺ | 211.1693 | 211.1692 | -0.4 | 211.1688, 175.1491 | 18 |
| 177 | 23.01 | Swertisin | C ₂₂ H ₂₂ O ₁₀ | [M+H] ⁺ | 447.1286 | 447.1283 | -0.7 | 285.0748 | 3 |
| 69 | 23.01 | Neohesperidin | C ₂₈ H ₃₄ O ₁₅ | [M+H] ⁺ | 611.1971 | 611.1971 | 0.2 | 303.0869, 195.0290, 153.0182 | 15, 16 |
| 71 | 23.56 | 4',7-Dihydroxyflavone | C ₁₅ H ₁₀ O ₄ | [M+H] ⁺ | 255.0652 | 255.0653 | 0.3 | 237.0552, 227.0716, 199.0761, 181.0654, 137.0243, 91.0570 | 8 |
| 178 | 23.63 | Meranzin | C ₁₅ H ₁₆ O ₄ | [M+H] ⁺ | 261.1121 | 261.1119 | -0.9 | 189.0537, 131.0492 | 15, 16 |
| 179 | 23.64 | Meranzin hydrate | C ₁₅ H ₁₈ O ₅ | [M+H] ⁺ | 279.1227 | 279.1227 | 0.1 | 243.1031, 189.0551, 131.0504 | 15, 16 |
| 73 | 23.84 | Ononin | C ₂₂ H ₂₂ O ₉ | [M+H] ⁺ | 431.1337 | 431.1338 | 0.3 | 431.1337, 269.0811 | 14 |
| 74 | 23.96 | Daidzein | C ₁₅ H ₁₀ O ₄ | [M+H] ⁺ | 255.0652 | 255.0653 | 0.3 | 237.0552, 227.0716, 199.0761, 181.0654, 137.0243 | 14 |
| 180 | 26.28 | Hexopyranosyl-(1->3)- [hexopyranosyl-(1->6)]-1- O-(3,23-dihydroxy-23,28- dioxoolean-12-en-28- yl)hexopyranose | C ₄₈ H ₇₆ O ₂₀ | [M+H] ⁺ | 973.5003 | 973.5023 | 2.1 | 973.3679, 485.3319 | 8 |
| 181 | 26.95 | yatein | C ₂₂ H ₂₄ O ₇ | [M+H] ⁺ | 401.1595 | 401.1599 | 1 | 383.1059, 315.0872, 217.0866, 167.0699 | 13 |
| 182 | 27.04 | (Z)-3-butylidenephthalide | C ₁₂ H ₁₂ O ₂ | [M+H] ⁺ | 189.091 | 189.0909 | -0.7 | 189.0908, 128.0632 | 1.2 |
| 58 | 28.55 | Mudanpioside H | C ₃₀ H ₃₂ O ₁₄ | [M+H] ⁺ | 617.1865 | 617.1849 | -2.6 | 617.18486, 331.1012 | 9,10 |
| 183 | 28.83 | Gingerenone B | C ₂₂ H ₂₆ O ₆ | [M+H] ⁺ | 387.1802 | 387.1806 | 0.9 | 207.1012, 175.0762, 167.0707, 137.0604 | 18 |
| 84 | 29.01 | Genistein | C ₁₅ H ₁₀ O ₅ | [M+H] ⁺ | 271.0601 | 271.0604 | 0.9 | 215.0701, 197.0602, 153.0198 | 14 |
| 85 | 29.21 | 7,8,4'- trihydroxyisoflavone | C ₁₅ H ₁₀ O ₅ | [M+H] ⁺ | 271.0601 | 271.0604 | 0.9 | 243.0646, 215.0687, 153.0187 | 14 |
| 184 | 29.29 | Gingerenone A | C ₂₁ H ₂₄ O ₅ | [M+H] ⁺ | 357.1697 | 357.17 | 1 | 177.0914, 145.0656, 137.0605, 131.0502, 117.0713 | 18 |
| 185 | 30.7 | Hederagenin | C ₃₀ H ₄₈ O ₄ | [M+H] ⁺ | 473.3625 | 473.3625 | 0 | 473.3636, 437.3511 | 4,5 |
| 91 | 31 | benzoylpaeoniflorin | C ₃₀ H ₃₂ O ₁₂ | [M+H] ⁺ | 585.1967 | 585.1972 | 0.9 | 319.1181, 267.0902, 249.0755, 197.0820 | 4,5 |
| 186 | 32.01 | Neral | C ₁₀ H ₁₆ O | [M+H] ⁺ | 153.1274 | 153.1279 | 0.4 | 153.1279 | 18 |
| 187 | 32.69 | Menthoside | C ₃₆ H ₃₆ O ₁₇ | [M+Na] ⁺ | 763.1845 | 763.1851 | 0.8 | 783.1893, 619.1345, 517.0956 | 7 |

| | | | | | | | | | |
|-----|-------|----------------------|---|--------------------|----------|----------|------|---|--------|
| 188 | 32.99 | Phellandral | C ₁₀ H ₁₆ O | [M+H] ⁺ | 153.1274 | 153.1275 | 0.2 | 153.1275 | 17 |
| 189 | 33.87 | Pulegone | C ₁₀ H ₁₆ O | [M+H] ⁺ | 153.1274 | 153.1273 | -0.8 | 107.0859, 91.0546, 81.0722, 79.0567 | 17 |
| 190 | 33.87 | Liconeolignan | C ₂₁ H ₂₂ O ₅ | [M+H] ⁺ | 355.154 | 355.1525 | -4.4 | 355.1539, 185.0210 | 11, 12 |
| 191 | 33.87 | Citral | C ₁₀ H ₁₆ O | [M+H] ⁺ | 153.1274 | 153.1273 | -0.8 | 107.0859, 91.0546, 81.0722, 79.0567 | 18 |
| 98 | 35.28 | Gardenone | C ₁₂ H ₂₀ O ₃ | [M+H] ⁺ | 213.1485 | 213.1485 | 0 | 213.1485, 79.0575 | 8 |
| 192 | 36.51 | Guaiene | C ₁₅ H ₂₄ | [M+H] ⁺ | 205.1951 | 205.1949 | -0.7 | 149.0260, 135.1162, 107.0873, 81.0745 | 18 |
| 193 | 36.69 | (+)-β-selinene | C ₁₅ H ₂₄ | [M+H] ⁺ | 205.1951 | 205.1949 | -0.7 | 205.1851, 149.0231 | 6 |
| 194 | 36.69 | β-chamigrene | C ₁₅ H ₂₄ | [M+H] ⁺ | 205.1951 | 205.1949 | -0.7 | 149.1329, 135.1179, 123.1184, 81.0722 | 1, 2 |
| 195 | 36.69 | copaene | C ₁₅ H ₂₄ | [M+H] ⁺ | 205.1951 | 205.1949 | -0.7 | 149.1329, 135.1179, 123.1184, 93.0718, 81.072 | 18 |
| 196 | 36.69 | β-selinene | C ₁₅ H ₂₄ | [M+H] ⁺ | 205.1951 | 205.1949 | -0.7 | 149.0260, 135.1162, 81.0745 | 8 |
| 197 | 36.69 | germacrene B | C ₁₅ H ₂₄ | [M+H] ⁺ | 205.1951 | 205.1949 | -0.7 | 149.1329, 135.1179, 123.1184, 81.0722 | 15, 16 |
| 198 | 36.92 | β-curcumene | C ₁₅ H ₂₄ | [M+H] ⁺ | 205.1951 | 205.1949 | -0.7 | 149.0260, 135.1162, 107.0873, 81.0745 | 11, 12 |
| 199 | 37.21 | Saikosaponin I | C ₄₈ H ₇₈ O ₁₇ | [M+H] ⁺ | 927.5312 | 927.5325 | 1.4 | 745.4441, 421.3483 | 13 |
| 200 | 38.07 | Saikosaponin f | C ₄₈ H ₈₀ O ₁₇ | [M+H] ⁺ | 929.5468 | 929.5486 | 1.9 | 603.42841.3748, 423.3652, 309.1211 | 13 |
| 201 | 38.33 | Safrole | C ₁₀ H ₁₀ O ₂ | [M+H] ⁺ | 163.0754 | 163.0754 | 0 | 131.0505, 103.0560, 77.0420 | 1, 2 |
| 202 | 38.76 | 6-gingediol | C ₁₇ H ₂₈ O ₄ | [M+H] ⁺ | 297.206 | 297.2062 | 0.6 | 281.0507, 248.9910, 163.0773, 137.0611 | 18 |
| 203 | 38.95 | β-sesquiphellandrene | C ₁₅ H ₂₄ | [M+H] ⁺ | 205.1951 | 205.1953 | 0.3 | 205.1953 | 18 |
| 100 | 39.64 | 3'-Methoxydaidzein | C ₁₆ H ₁₂ O ₅ | [M+H] ⁺ | 285.0758 | 285.076 | 0.9 | 270.0554, 242.0579, 153.0198 | 14 |
| 102 | 39.86 | 6-Gingerol | C ₁₇ H ₂₆ O ₄ | [M+H] ⁺ | 295.1904 | 295.1905 | 0.3 | 277.2156, 163.0763, 137.0605 | 18 |
| 204 | 39.86 | 6-shogaol | C ₁₇ H ₂₄ O ₃ | [M+H] ⁺ | 277.1798 | 277.18 | 0.5 | 177.0980, 145.0652, 137.0605, 117.0709 | 18 |
| 205 | 39.93 | Nobiletin | C ₂₁ H ₂₂ O ₈ | [M+H] ⁺ | 403.1387 | 403.1391 | 0.9 | 388.1173, 373.0929 | 15, 16 |
| 206 | 40.58 | Zizyberanalic acid | C ₃₀ H ₄₆ O ₄ | [M+H] ⁺ | 471.3469 | 471.3471 | 0.4 | 471.34689 | 3 |
| 105 | 40.58 | Glycyrrhizic acid | C ₄₂ H ₆₂ O ₁₆ | [M+H] ⁺ | 823.4111 | 823.4115 | 0.6 | 647.3800, 417.3479, 453.3360, 435.3269 | 11, 12 |
| 207 | 41.06 | Atractylenolide III | C ₁₅ H ₂₀ O ₃ | [M+H] ⁺ | 249.1485 | 249.1487 | 0.5 | 231.1389, 163.0756, 105.0708 | 6 |
| 107 | 41.79 | Saikosaponin A | C ₄₂ H ₆₈ O ₁₃ | [M+H] ⁺ | 781.4733 | 781.474 | 0.9 | 455.3455, 437.3488, 419.3331, 407.3332 | 13 |
| 208 | 41.79 | Prosaikogenin G | C ₃₆ H ₅₈ O ₈ | [M+H] ⁺ | 619.4205 | 619.4208 | 0.5 | 455.3531, 437.3465, 407.3330, 253.1950 | 13 |
| 209 | 42.09 | Prosaikogenin F | C ₃₆ H ₅₈ O ₈ | [M+H] ⁺ | 619.4205 | 619.4208 | 0.5 | 455.3531, 437.3465, 407.3330, 253.1950 | 13 |
| 108 | 42.1 | Saikosaponin D | C ₄₂ H ₆₈ O ₁₃ | [M+H] ⁺ | 781.4733 | 781.474 | 0.9 | 619.2516, 473.2350, 441.1020 | 13 |
| 111 | 42.37 | Bupleuroside I | C ₄₈ H ₇₈ O ₁₈ | [M+H] ⁺ | 943.5261 | 943.5274 | 1.4 | 797.4711, 599.3992, 441.3761, 423.3645 | 13 |
| 112 | 42.37 | Jujubasaponin V | C ₄₈ H ₇₈ O ₁₈ | [M+H] ⁺ | 943.5261 | 943.5274 | 1.4 | 797.4711, 599.3992, 441. 3781, 423.3645 | 17 |
| 210 | 42.48 | Chaihunaphthone | C ₂₂ H ₁₈ O ₇ | [M+H] ⁺ | 395.1125 | 395.1109 | -4.2 | 395.11086 | 13 |
| 113 | 42.53 | Isokaerophyllin | C ₂₁ H ₂₀ O ₆ | [M+H] ⁺ | 369.1333 | 369.1333 | 0 | 313.0724, 285.0780, 255.0659 | 13 |
| 114 | 42.53 | Curcumin | C ₂₁ H ₂₀ O ₆ | [M+H] ⁺ | 369.1333 | 369.1333 | 0 | 313.0724, 285.0780, 255.0659 | 18 |

| | | | | | | | | | |
|-----|-------|-----------------------|---|--------------------|----------|----------|------|--|--------|
| 211 | 42.79 | Prosaikogenin A | C ₃₆ H ₅₈ O ₈ | [M+H] ⁺ | 619.4205 | 619.4208 | 0.5 | 455.3531, 437.3465, 407.3330, 253.1950 | 13 |
| 116 | 42.99 | Saikosaponin B1 | C ₄₂ H ₆₈ O ₁₃ | [M+H] ⁺ | 781.4733 | 781.474 | 0.9 | 455.3455, 437.3488, 419.3331, 407.3332 | 13 |
| 118 | 43.34 | Saikosaponin B2 | C ₄₂ H ₆₈ O ₁₃ | [M+H] ⁺ | 781.4733 | 781.474 | 0.9 | 455.3521, 437.3434, 419.3334 | 13 |
| 212 | 43.59 | Lupenone | C ₃₀ H ₄₈ O | [M+H] ⁺ | 425.3778 | 425.3778 | -0.1 | 257.1839, | 20 |
| 213 | 44.16 | Ligustilide | C ₁₂ H ₁₄ O ₂ | [M+H] ⁺ | 191.1067 | 191.1065 | -0.8 | 173.0985, 145.1006, 115.0562, 91.0554 | 1,2 |
| 127 | 45.17 | Glycyrol | C ₂₁ H ₁₈ O ₆ | [M+H] ⁺ | 367.1176 | 367.1179 | 0.9 | 367.1201, 311.0534, 2810480 | 11, 12 |
| 214 | 45.98 | Atractylenolide II | C ₁₅ H ₂₀ O ₂ | [M+H] ⁺ | 233.1536 | 233.1537 | 0.2 | 215.1418, 187.1478, 131.0856 | 6 |
| 128 | 46.07 | Honokiol | C ₁₈ H ₁₈ O ₂ | [M+H] ⁺ | 267.138 | 267.1377 | -0.8 | 239.1078, 211.0764, 197.0600, 165.0706 | 17 |
| 215 | 46.61 | Bupleuroside V | C ₄₂ H ₆₆ O ₁₅ | [M+H] ⁺ | 811.4475 | 811.4482 | 0.9 | 599.3950, 441.3772, 423.3634, | 13 |
| 216 | 46.61 | (8)-Gingerol | C ₁₉ H ₃₀ O ₄ | [M+H] ⁺ | 323.2217 | 323.2213 | -1.1 | 177.0914, 137.0604 | 18 |
| 130 | 47.6 | Magnolol | C ₁₈ H ₁₈ O ₂ | [M+H] ⁺ | 267.138 | 267.1377 | -0.8 | 239.1078, 211.0769, 197.0608, 165.0708 | 17 |
| 132 | 48.11 | Iso-Glycyrol | C ₂₁ H ₁₈ O ₆ | [M+H] ⁺ | 367.1176 | 367.1179 | 0.9 | 367.1179 | 11, 12 |
| 217 | 48.25 | Atractylenolide I | C ₁₅ H ₁₈ O ₂ | [M+H] ⁺ | 231.138 | 231.1381 | 0.8 | 163.0758, 105.0715, 77.0422 | 6 |
| 218 | 48.45 | Xanthorrhizol | C ₁₅ H ₂₂ O | [M+H] ⁺ | 219.1743 | 219.1742 | -0.7 | 203.1365, 145.1013, 91.0549 | 18 |
| 139 | 48.89 | Tumulolic acid | C ₃₁ H ₅₀ O ₄ | [M+H] ⁺ | 487.3782 | 487.3774 | -1.7 | 469.3681 | 19, 20 |
| 219 | 50.24 | (-)- α -Pinene | C ₁₀ H ₁₆ | [M+H] ⁺ | 137.1325 | 137.1322 | -2.3 | 137.0646, 122.0394 | 18 |
| 220 | 50.24 | Camphene | C ₁₀ H ₁₆ | [M+H] ⁺ | 137.1325 | 137.1322 | -2.3 | 137.0646, 122.0394 | 18 |
| 221 | 50.24 | (-)-Nopinene | C ₁₀ H ₁₆ | [M+H] ⁺ | 137.1325 | 137.1322 | -2.3 | 137.1324 | 15, 16 |
| 222 | 50.52 | Linalool Oxide | C ₁₀ H ₁₈ O ₂ | [M+H] ⁺ | 171.138 | 171.1377 | -1.5 | 141.0631, 73.0324 | 18 |
| 223 | 51.48 | 1-Monolinolein | C ₂₁ H ₃₈ O ₄ | [M+H] ⁺ | 355.2843 | 355.2825 | -5 | 355.2828 | 18 |
| 224 | 51.78 | 10-Gingerdione | C ₂₁ H ₃₂ O ₄ | [M+H] ⁺ | 349.2373 | 349.2375 | 0.5 | 331.2280, 155.1442, 137.0607 | 18 |
| 149 | 52.14 | Linoleic acid | C ₁₈ H ₃₂ O ₂ | [M+H] ⁺ | 281.2475 | 281.2473 | -0.7 | 242.2316, 95.0898 | 13 |
| 225 | 52.51 | Trochol | C ₃₀ H ₅₀ O ₂ | [M+H] ⁺ | 443.3884 | 443.3885 | 0.3 | 217.1937, 191.1752, 163.148 | 3 |

Table 4 Precision and accuracy for twelve compounds in rats plasma (n=6)

| Analytes | Spiked concentration (ng/mL) | Intra-day | | | Inter-day | | |
|---------------------|------------------------------|--------------------------------|------------------|----------------|--------------------------------|------------------|----------------|
| | | Measured concentration (ng/mL) | Precision RSD(%) | Accuracy RE(%) | Measured concentration (ng/mL) | Precision RSD(%) | Accuracy RE(%) |
| Atractylenolide III | 2.0(LLOQ) | 1.93±0.08 | 4.09 | -3.42 | 2.04±0.12 | 5.75 | 1.92 |
| | 4.0(Low) | 4.14±0.07 | 1.77 | 3.54 | 4.16±0.14 | 3.41 | 3.88 |
| | 200.0(Medium) | 214.50±13.58 | 6.33 | 7.25 | 214.50±11.40 | 5.31 | 7.25 |
| | 2000.0(High) | 2240.00±116.48 | 5.20 | 12.00 | 2110.00±174.12 | 8.25 | 5.50 |
| Daidzein | 2.0(LLOQ) | 1.88±0.15 | 8.19 | -6.25 | 2.06±0.09 | 4.23 | 2.92 |
| | 4.0(Low) | 4.12±0.18 | 4.35 | 2.88 | 4.31±0.21 | 4.94 | 7.67 |
| | 200.0(Medium) | 202.33±4.23 | 2.09 | 1.17 | 208.83±11.92 | 5.71 | 4.42 |
| | 2000.0(High) | 1973.33±62.18 | 3.25 | -1.33 | 2138.33±55.29 | 2.59 | 6.92 |
| Ferulic Acid | 2.0(LLOQ) | 2.32±0.04 | 1.98 | 6.75 | 2.04±0.17 | 8.40 | 2.17 |
| | 4.0(Low) | 4.66±0.21 | 4.49 | 16.46 | 4.53±0.06 | 1.33 | 13.21 |
| | 200.0(Medium) | 194.67±9.05 | 4.65 | -2.67 | 212.67±21.71 | 10.21 | 6.33 |
| | 2000.0(High) | 1731.67±46.23 | 2.67 | -13.45 | 1883.33±82.87 | 4.40 | -5.83 |
| Geniposide | 2.0(LLOQ) | 2.00±0.18 | 8.87 | 0.17 | 2.02±0.13 | 6.26 | 1.17 |
| | 4.0(Low) | 3.93±0.18 | 4.64 | -1.67 | 4.20±0.27 | 6.37 | 5.00 |
| | 200.0(Medium) | 198.67±12.42 | 6.25 | -0.67 | 213.67±15.96 | 7.47 | 6.83 |
| | 2000.0(High) | 1866.67±53.91 | 2.89 | -6.67 | 2033.33±142.22 | 6.99 | 1.67 |
| Glycyrrhizic acid | 2.0(LLOQ) | 1.97±0.15 | 7.72 | -1.75 | 2.07±0.16 | 7.73 | 3.25 |
| | 4.0(Low) | 4.09±0.18 | 4.52 | 2.25 | 4.06±0.18 | 4.48 | 1.46 |
| | 200.0(Medium) | 199.00±9.25 | 4.65 | -0.50 | 201.00±18.89 | 9.40 | 0.50 |
| | 2000.0(High) | 1785±60.25 | 3.38 | -10.75 | 1918.33±89.54 | 4.68 | -4.08 |
| Hesperidin | 2.0(LLOQ) | 2.03±0.14 | 7.04 | 1.27 | 2.05±0.15 | 7.48 | 2.42 |
| | 4.0(Low) | 4.33±0.14 | 3.34 | 8.25 | 4.19±0.29 | 6.89 | 4.83 |
| | 200.0(Medium) | 200.67±5.43 | 2.71 | 0.33 | 213.17±20.99 | 9.85 | 6.58 |

| | | | | | | | |
|------------------|---------------|----------------|------|--------|----------------|-------|-------|
| Liquiritin | 2000.0(High) | 1754.83±44.23 | 2.52 | -12.26 | 1885.00±120.29 | 6.38 | -5.75 |
| | 2.0(LLOQ) | 1.84±0.10 | 5.52 | -8.08 | 2.11±0.08 | 3.98 | 5.33 |
| | 4.0(Low) | 4.19±0.21 | 5.07 | 4.75 | 4.28±0.23 | 5.34 | 6.88 |
| | 200.0(Medium) | 196.67±11.66 | 5.93 | -1.67 | 206.50±26.07 | 12.62 | 3.25 |
| Magnolol | 2000.0(High) | 2041.67±110.35 | 5.40 | 2.08 | 2006.67±158.83 | 7.92 | 0.33 |
| | 2.0(LLOQ) | 1.92±0.13 | 6.85 | -4.08 | 2.14±0.27 | 12.45 | 6.92 |
| | 4.0(Low) | 4.29±0.07 | 1.61 | 7.33 | 4.18±0.34 | 8.13 | 4.54 |
| | 200.0(Medium) | 198.00±4.94 | 2.49 | -1.00 | 214.50±13.23 | 6.17 | 7.25 |
| Meranzin hydrate | 2000.0(High) | 2138.33±83.53 | 3.91 | 6.92 | 1975.00±81.91 | 4.15 | -1.25 |
| | 2.0(LLOQ) | 2.12±0.09 | 4.24 | 6.17 | 2.17±0.09 | 4.07 | 8.33 |
| | 4.0(Low) | 3.88±0.14 | 3.60 | -2.92 | 3.96±0.12 | 2.96 | -0.92 |
| | 200.0(Medium) | 200.50±7.01 | 3.49 | 0.25 | 190.83±17.37 | 9.10 | -4.58 |
| Naringin | 2000.0(High) | 1763.33±56.10 | 3.18 | -11.83 | 1830.00±50.20 | 2.74 | -8.50 |
| | 2.0(LLOQ) | 2.10±0.19 | 9.06 | 5.08 | 2.13±0.15 | 6.97 | 6.33 |
| | 4.0(Low) | 4.06±0.11 | 2.65 | 1.42 | 4.04±0.25 | 6.24 | 1.00 |
| | 200.0(Medium) | 200.50±4.37 | 2.18 | 0.25 | 219.00±17.06 | 7.79 | 9.50 |
| Paeoniflorin | 2000.0(High) | 2008.33±125.76 | 6.26 | 0.42 | 2102.50±126.48 | 6.02 | 5.13 |
| | 2.0(LLOQ) | 2.00±0.11 | 5.70 | -0.25 | 1.97±0.28 | 14.37 | -1.58 |
| | 4.0(Low) | 4.05±0.30 | 7.32 | 1.17 | 4.02±0.15 | 3.64 | 0.46 |
| | 200.0(Medium) | 203.67±9.91 | 4.87 | 1.83 | 222.50±8.55 | 3.84 | 11.25 |
| Puerarin | 2000.0(High) | 2240.00±38.99 | 1.74 | 12.00 | 2197.00±71.26 | 3.24 | 9.85 |
| | 2.0(LLOQ) | 1.99±0.19 | 9.56 | -0.33 | 2.22±0.12 | 5.44 | 11.08 |
| | 4.0(Low) | 4.05±0.23 | 5.80 | 1.67 | 3.99±0.24 | 5.94 | -0.25 |
| | 200.0(Medium) | 219.50±12.05 | 5.49 | 9.75 | 231.50±8.92 | 3.85 | 15.75 |
| | 2000.0(High) | 1936.67±66.23 | 3.42 | -3.17 | 1940±164.32 | 8.47 | -3.00 |

Table5 Extraction recovery and matrix effects for twelve compounds in rats plasma (n=6)

| Analytes | Spiked concentration (ng/mL) | Extraction Recovery | | Matrix effect | |
|---------------------|---------------------------------|---------------------|--------|---------------|--------|
| | | Mean(%) | RSD(%) | Mean(%) | RSD(%) |
| Atractylenolide III | 2.0(LLOQ) | 90.97 | 4.12 | 91.91 | 4.53 |
| | 4.0(Low) | 92.81 | 5.52 | 93.40 | 6.13 |
| | 200.0(Medium) | 94.55 | 5.09 | 90.11 | 5.76 |
| | 2000.0(High) | 95.17 | 3.68 | 97.88 | 1.60 |
| Daidzein | 2.0(LLOQ) | 91.91 | 4.76 | 96.14 | 2.59 |
| | 4.0(Low) | 97.56 | 3.28 | 93.68 | 3.49 |
| | 200.0(Medium) | 97.20 | 2.08 | 95.11 | 3.90 |
| | 2000.0(High) | 95.33 | 3.15 | 96.91 | 3.09 |
| Ferulic Acid | 2.0(LLOQ) | 92.87 | 3.70 | 90.90 | 6.75 |
| | 4.0(Low) | 93.03 | 5.71 | 94.63 | 5.70 |
| | 200.0(Medium) | 94.92 | 4.67 | 96.98 | 4.85 |
| | 2000.0(High) | 96.73 | 3.23 | 94.70 | 2.85 |
| Geniposide | 2.0(LLOQ) | 91.48 | 5.67 | 96.86 | 3.11 |
| | 4.0(Low) | 93.83 | 3.61 | 96.18 | 5.61 |
| | 200.0(Medium) | 95.04 | 6.22 | 92.99 | 5.82 |
| | 2000.0(High) | 97.73 | 2.89 | 93.97 | 3.35 |
| Glycyrrhizic acid | 2.0(LLOQ) | 93.42 | 3.47 | 92.28 | 4.01 |
| | 4.0(Low) | 96.25 | 2.84 | 95.75 | 3.10 |
| | 200.0(Medium) | 94.78 | 4.59 | 91.47 | 5.61 |
| | 2000.0(High) | 95.46 | 3.37 | 96.48 | 2.68 |
| Hesperidin | 2.0(LLOQ) | 95.56 | 3.31 | 95.67 | 2.01 |
| | 4.0(Low) | 96.79 | 2.19 | 97.47 | 3.35 |
| | 200.0(Medium) | 96.03 | 2.67 | 92.25 | 5.63 |
| | 2000.0(High) | 97.49 | 2.52 | 90.90 | 5.55 |
| Liquiritin | 2.0(LLOQ) | 96.72 | 2.88 | 96.42 | 2.18 |
| | 4.0(Low) | 94.63 | 3.62 | 96.13 | 2.35 |
| | 200.0(Medium) | 95.50 | 5.88 | 95.80 | 4.62 |
| | 2000.0(High) | 92.81 | 5.40 | 95.59 | 3.92 |

| | | | | | |
|------------------|---------------|-------|------|-------|------|
| | 2.0(LLOQ) | 95.41 | 4.27 | 95.20 | 3.33 |
| Magnolol | 4.0(Low) | 97.95 | 1.27 | 96.51 | 3.40 |
| | 200.0(Medium) | 96.13 | 2.48 | 93.04 | 5.62 |
| | 2000.0(High) | 97.20 | 3.90 | 96.76 | 3.06 |
| | 2.0(LLOQ) | 96.28 | 2.76 | 90.77 | 4.41 |
| Meranzin hydrate | 4.0(Low) | 95.04 | 2.79 | 91.11 | 5.49 |
| | 200.0(Medium) | 95.02 | 3.48 | 96.02 | 2.62 |
| | 2000.0(High) | 96.89 | 3.18 | 95.89 | 3.97 |
| | 2.0(LLOQ) | 95.26 | 5.20 | 93.96 | 5.30 |
| Naringin | 4.0(Low) | 96.78 | 1.92 | 95.33 | 4.16 |
| | 200.0(Medium) | 97.35 | 2.16 | 94.78 | 4.69 |
| | 2000.0(High) | 91.29 | 6.26 | 96.12 | 4.81 |
| | 2.0(LLOQ) | 96.26 | 3.42 | 96.47 | 1.99 |
| Paeoniflorin | 4.0(Low) | 94.77 | 5.52 | 94.60 | 4.55 |
| | 200.0(Medium) | 93.88 | 4.84 | 94.93 | 4.25 |
| | 2000.0(High) | 97.82 | 1.74 | 95.09 | 4.04 |
| | 2.0(LLOQ) | 91.19 | 6.17 | 94.02 | 2.93 |
| Puerarin | 4.0(Low) | 93.02 | 4.56 | 94.81 | 3.88 |
| | 200.0(Medium) | 95.86 | 5.46 | 94.81 | 4.09 |
| | 2000.0(High) | 94.93 | 3.42 | 93.47 | 3.78 |

Table 6 Stability of twelve compounds in rats plasma (n=6)

| Analytes | Spiked concentration (ng/mL) | Freeze-thraw | | Long-term | | Short-term | | Processed -stability | |
|---------------------|---------------------------------|--------------|--------|-----------|--------|------------|--------|----------------------|--------|
| | | RE(%) | RSD(%) | RE(%) | RSD(%) | RE(%) | RSD(%) | RE(%) | RSD(%) |
| Atractylenolide III | 2.0(LLOQ) | 1.17 | 7.34 | 4.00 | 2.74 | 3.67 | 6.23 | 6.00 | 4.94 |
| | 4.0(Low) | 5.67 | 2.90 | 9.46 | 3.50 | 6.63 | 3.40 | 1.33 | 4.28 |
| | 200.0(Medium) | 12.33 | 5.29 | 3.92 | 2.42 | -2.67 | 10.53 | 10.83 | 4.00 |
| | 2000.0(High) | 7.75 | 4.94 | 5.17 | 5.32 | 4.17 | 5.95 | 3.92 | 8.21 |
| Daidzein | 2.0(LLOQ) | 5.42 | 6.60 | 5.58 | 4.44 | 3.67 | 5.99 | 1.42 | 6.42 |
| | 4.0(Low) | 8.71 | 3.77 | 3.50 | 4.85 | 6.71 | 4.87 | 0.67 | 3.33 |
| | 200.0(Medium) | 3.50 | 5.34 | 6.75 | 2.60 | 9.08 | 2.74 | 8.67 | 1.38 |
| Ferulic Acid | 2000.0(High) | 7.33 | 3.78 | 7.42 | 2.47 | 9.75 | 3.99 | 10.83 | 2.01 |
| | 2.0(LLOQ) | 6.17 | 7.29 | -1.42 | 7.67 | -0.25 | 5.53 | -7.50 | 5.70 |
| | 4.0(Low) | 8.75 | 7.52 | 10.71 | 2.82 | 10.42 | 6.59 | 3.88 | 7.16 |
| | 200.0(Medium) | 6.58 | 8.96 | 11.17 | 3.15 | -0.83 | 11.75 | 3.67 | 4.93 |
| Geniposide | 2000.0(High) | -7.75 | 2.54 | -4.67 | 4.31 | -9.17 | 6.22 | -5.83 | 5.99 |
| | 2.0(LLOQ) | 3.58 | 5.29 | 4.00 | 7.28 | 2.42 | 9.71 | -1.17 | 5.63 |
| | 4.0(Low) | 2.29 | 6.12 | 2.38 | 5.13 | 10.21 | 8.21 | 10.88 | 2.07 |
| | 200.0(Medium) | 5.58 | 6.12 | 5.33 | 7.30 | 4.50 | 8.32 | 12.08 | 5.65 |
| Glycyrrhizic acid | 2000.0(High) | 4.50 | 3.83 | -1.25 | 6.48 | -6.25 | 5.83 | 2.75 | 6.63 |
| | 2.0(LLOQ) | -1.75 | 7.57 | -4.50 | 6.02 | 3.81 | 11.09 | 6.75 | 5.77 |
| | 4.0(Low) | 5.83 | 4.57 | -0.67 | 3.93 | 0.96 | 8.20 | -1.42 | 4.23 |
| | 200.0(Medium) | -3.00 | 7.58 | -4.75 | 6.75 | 5.25 | 6.50 | -2.58 | 9.17 |
| Hesperidin | 2000.0(High) | -4.75 | 3.99 | -2.33 | 8.84 | -2.75 | 9.55 | -7.58 | 6.69 |
| | 2.0(LLOQ) | 6.33 | 5.56 | 4.25 | 6.99 | 4.08 | 3.85 | -0.75 | 9.54 |
| | 4.0(Low) | 4.63 | 4.92 | -0.13 | 6.00 | 1.67 | 6.54 | 8.42 | 3.13 |
| Liquiritin | 200.0(Medium) | 0.83 | 14.98 | 10.00 | 5.09 | 3.50 | 6.50 | -0.67 | 14.34 |
| | 2000.0(High) | -14.75 | 14.51 | 2.11 | 4.62 | -10.83 | 4.08 | -3.33 | 6.05 |
| | 2.0(LLOQ) | 4.08 | 3.59 | -1.58 | 4.83 | 2.25 | 8.10 | 9.00 | 4.20 |
| Liquiritin | 4.0(Low) | 7.54 | 5.00 | 7.79 | 4.35 | 4.58 | 5.01 | -1.42 | 4.23 |
| | 200.0(Medium) | 8.33 | 8.84 | 10.67 | 2.81 | 5.50 | 9.40 | -2.58 | 9.17 |

| | | | | | | | | | |
|------------------|---------------|-------|------|-------|-------|-------|------|-------|-------|
| | 2000.0(High) | 5.50 | 3.10 | 6.08 | 1.47 | 2.33 | 6.00 | -7.58 | 6.69 |
| | 2.0(LLOQ) | 9.67 | 8.99 | -5.33 | 6.34 | -7.42 | 6.84 | 11.00 | 6.92 |
| Magnolol | 4.0(Low) | 3.50 | 8.11 | 6.08 | 8.87 | 3.50 | 5.98 | 7.04 | 3.51 |
| | 200.0(Medium) | 8.92 | 6.68 | 9.92 | 2.41 | 1.58 | 8.29 | 8.00 | 5.39 |
| | 2000.0(High) | 1.75 | 7.07 | -2.08 | 6.58 | 4.75 | 6.69 | 2.42 | 5.40 |
| | 2.0(LLOQ) | 3.67 | 3.38 | -1.25 | 7.76 | 5.67 | 3.56 | 9.50 | 7.10 |
| Meranzin hydrate | 4.0(Low) | 0.29 | 4.75 | 2.08 | 3.78 | 0.38 | 5.74 | 0.50 | 2.74 |
| | 200.0(Medium) | -1.33 | 5.24 | -1.00 | 4.37 | -9.50 | 5.04 | -4.17 | 8.88 |
| | 2000.0(High) | -5.75 | 4.37 | -7.42 | 3.90 | -3.92 | 7.88 | -6.92 | 3.67 |
| | 2.0(LLOQ) | 4.50 | 6.10 | 5.75 | 4.91 | -6.67 | 5.12 | 1.00 | 8.53 |
| Naringin | 4.0(Low) | 2.71 | 8.31 | 1.88 | 6.07 | 0.29 | 5.07 | 0.08 | 5.78 |
| | 200.0(Medium) | 7.92 | 6.50 | 10.83 | 2.63 | 6.92 | 6.23 | 9.33 | 4.62 |
| | 2000.0(High) | 0.29 | 4.39 | 8.46 | 3.91 | 4.49 | 4.64 | 3.00 | 5.49 |
| | 2.0(LLOQ) | -3.17 | 8.72 | -0.42 | 13.49 | 1.67 | 6.91 | 16.50 | 11.08 |
| Paeoniflorin | 4.0(Low) | 7.42 | 3.76 | 3.04 | 7.16 | 1.25 | 6.36 | -1.92 | 1.54 |
| | 200.0(Medium) | 13.50 | 2.31 | 9.83 | 3.00 | 6.58 | 2.62 | 9.67 | 5.04 |
| | 2000.0(High) | 8.42 | 5.23 | 10.50 | 3.04 | 15.00 | 9.53 | -0.73 | 8.27 |
| | 2.0(LLOQ) | 9.08 | 4.18 | 9.58 | 5.52 | 5.33 | 7.56 | 5.92 | 10.02 |
| Puerarin | 4.0(Low) | 3.13 | 9.04 | 3.92 | 7.78 | 3.00 | 2.04 | -0.63 | 4.99 |
| | 200.0(Medium) | 13.83 | 2.71 | 13.00 | 2.41 | 14.41 | 1.71 | 13.17 | 1.74 |
| | 2000.0(High) | -0.92 | 6.87 | -4.92 | 8.59 | 5.58 | 4.17 | -1.58 | 3.85 |

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