Supporting Information

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Comparative Effects of Flavonoids from *Fructus Sophorae* on Rat Osteoblasts *in vitro*

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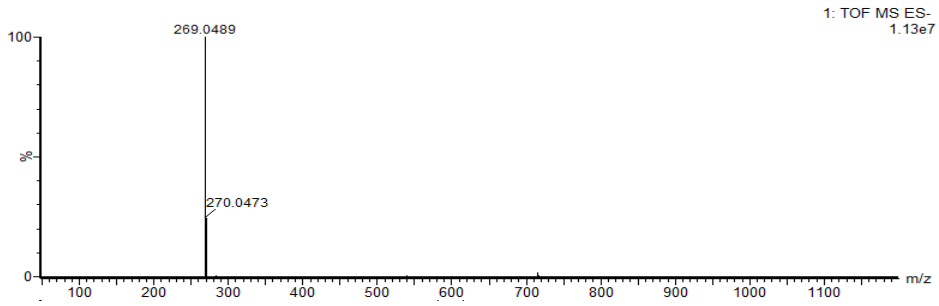
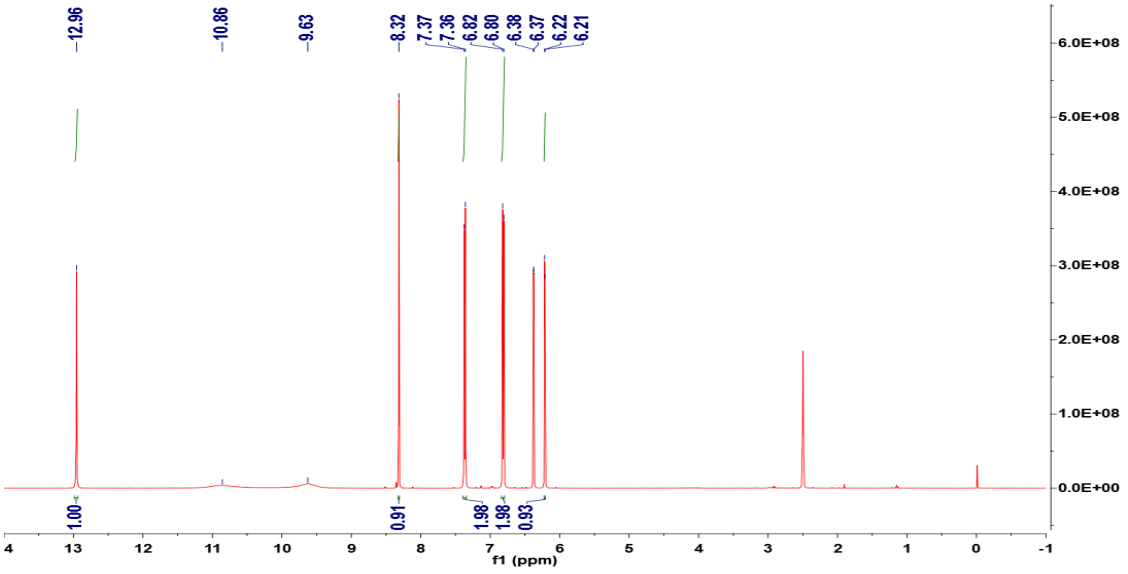
† These authors contribute equally.

S1 : *NMR and mass data and spectra of compound* ***1*** *(Genistein)*

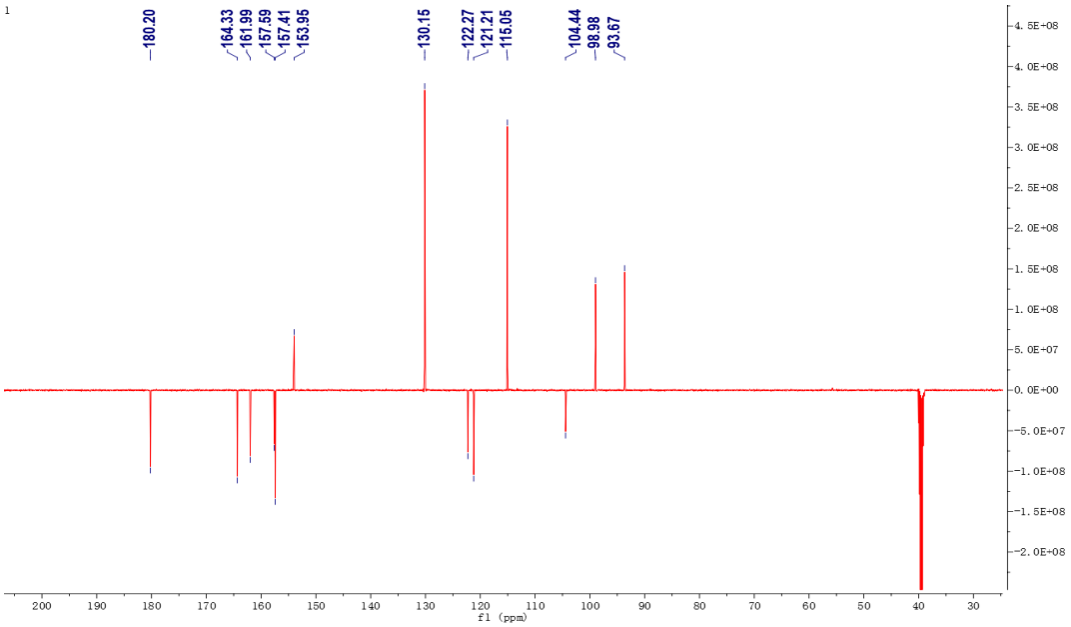
Q/TOF-MS (*m/z*): 269.0489 $[M-H]^-$, (calcd for $C_{15}H_{10}O_5$). ^1H NMR (500 MHz, DMSO-d_6) δ: 12.96 (1H, s, 5-OH), 10.86 (1H, s, 7-OH), 9.63 (H, s, 4′-OH), 8.32 (1H, s, H-2), 7.37 (2H, d, J = 8.6 Hz, H-2′, 6′), 6.82 (2H, d, J = 8.6 Hz, H-3′, 5′), 6.38 (1H, d, J = 2.1 Hz, H-8), 6.22 (1H, d, J = 2.1 Hz, H-6); DEPTQSP (125 MHz, DMSO-d_6) δ: 153.95 (C-2), 121.21 (C-3), 180.20 (C-4), 157.59 (C-5), 98.98 (C-6), 164.33 (C-7), 93.67 (C-8), 157.41 (C-9), 104.44 (C-10), 122.27 (C-1′), 130.15 (C-2′, 6′), 115.05 (C-3′, 5′), 161.99 (C-4′).



Compound **1:** Q/TOF-MS spectra



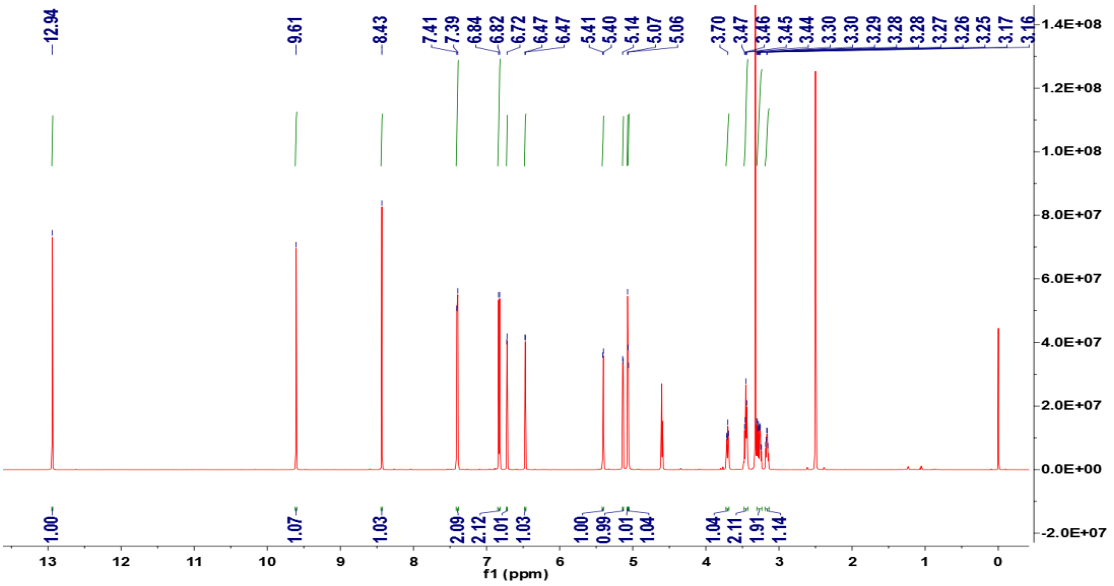
Compound **1:** ^1H-NMR spectra



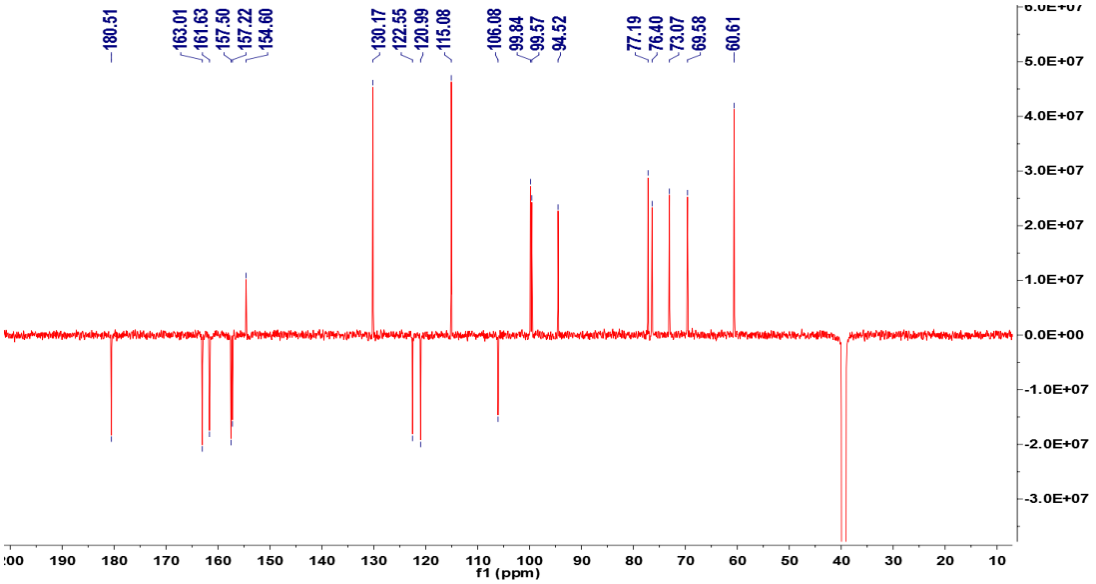
Compound **1:** DEPTQSP spectra

S2 : *NMR and mass data and spectra of compound* ***2*** *(Genistin)*

ESI-MS (*m/z)* : 431.09 $[M-H]^-$ (calcd for $C_{21}H_{20}O_{10}$). ^1H NMR (600 MHz, DMSO-d_6) δ: 12.94 (1H, s, 5-OH), 9.61 (H, s, 4′-OH), 8.43 (1H, s, H-2), 7.40 (2H, d, J = 8.4 Hz, H-2′, 6′), 6.83 (2H, d, J = 8.4 Hz, H-3′, 5′), 6.72 (1H, d, J = 2.1 Hz, H-8), 6.47 (1H, d, J = 2.1 Hz, H-6), 5.06 (d, J = 7.0 Hz, Glc-H-1″), 3.72-3.16 (m, 6H, Glc-H-2″-6″). DEPTQSP(125 MHz, DMSO-d_6) δ: 154.60 (C-2), 120.99 (C-3), 180.51 (C-4), 157.50 (C-5), 99.84 (C-6), 163.01 (C-7), 93.67 (C-8), 157.22 (C-9), 106.08 (C-10), 122.55 (C-1′), 130.17 (C-2′, 6′), 115.08 (C-3′, 5′), 161.63 (C-4′), 99.84 (C-1″), 73.07 (C-2″), 77.19 (C-3″), 69.58 (C-4″), 76.40 (C-5″), 60.61 (C-6″).



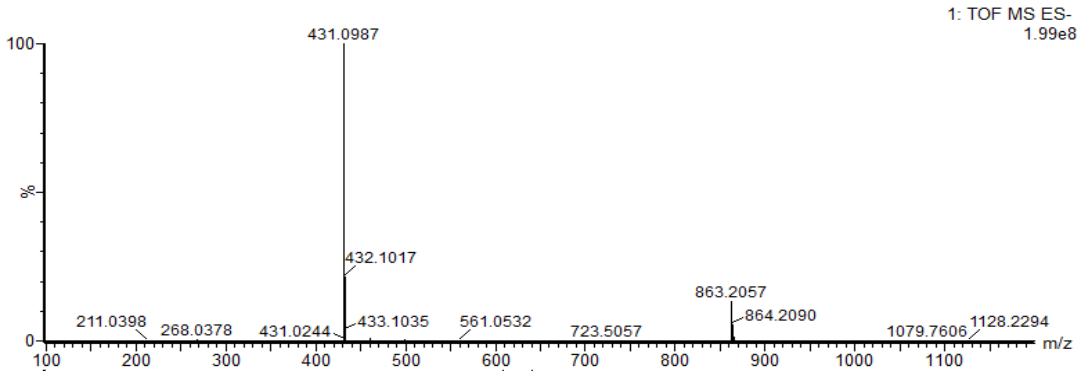
Compound **2:** ^1H-NMR spectra



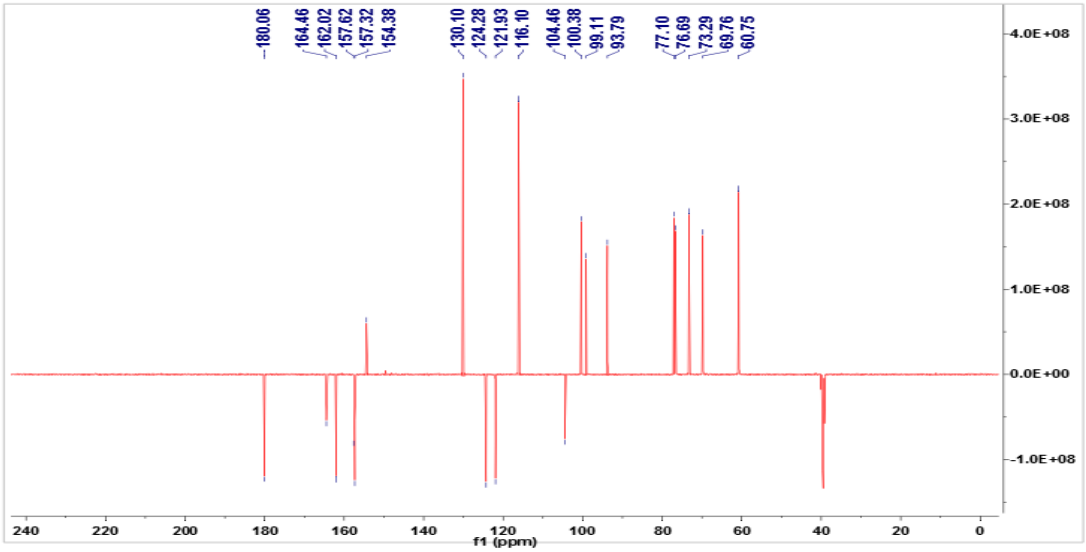
Compound **2:** DEPTQSP spectra

S3 : *NMR and mass data and spectra of compound* ***3*** *(Sophoricoside)*

Q/TOF-MS (*m/z)* : 431.0987 $[M-H]^-$ (calcd for $C_{21}H_{20}O_{10}$). DEPTQSP (125 MHz, DMSO-d_6) δ: 154.38 (C-2), 121.93 (C-3), 180.06 (C-4), 157.62 (C-5), 99.11 (C-6), 164.46 (C-7), 93.79 (C-8), 157.32 (C-9), 104.46 (C-10), 124.28 (C-1′), 130.10 (C-2′, 6′), 116.10 (C-3′, 5′), 162.02 (C-4′), 100.38 (C-1″), 73.29 (C-2″), 77.10 (C-3″), 69.76 (C-4″), 76.69 (C-5″), 60.75 (C-6″).



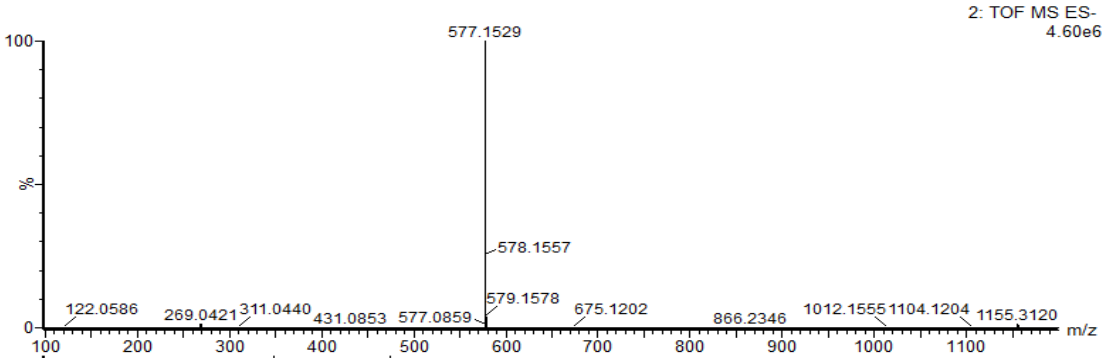
Compound **3:** Q/TOF-MS spectra



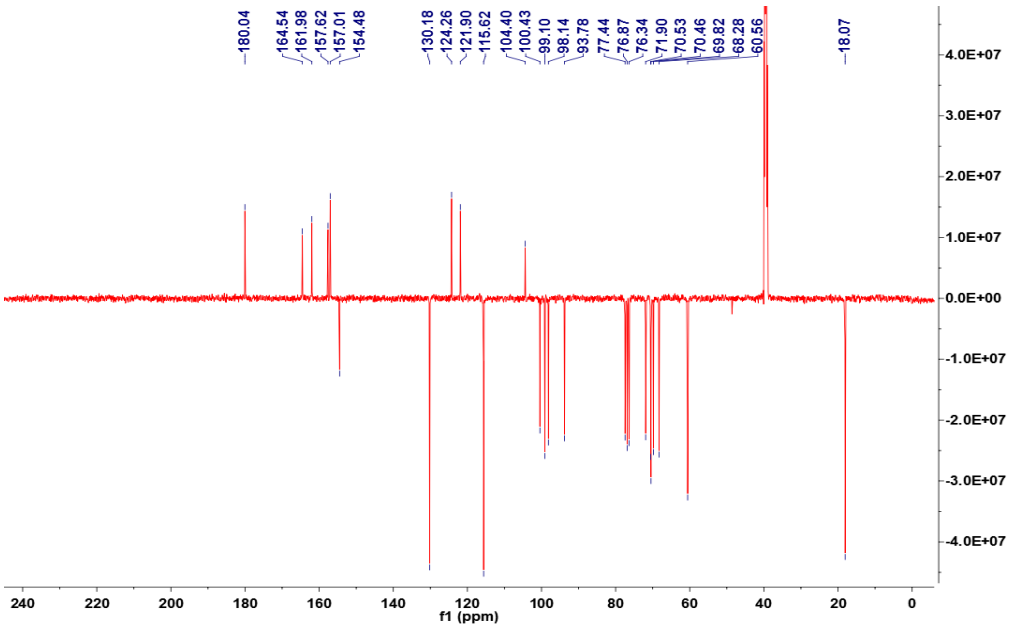
Compound **3:** DEPTQSP spectra

S4 : *NMR and mass data and spectra of compound* ***4*** *(Sophorabioside)*

Q/TOF-MS (*m/z*): 577.1529 $[M-H]^-$ (calcd for $C_{27}H_{30}O_{14}$). DEPTQSP (125 MHz, DMSO-d_6) δ: 154.48 (C-2), 121.90 (C-3), 180.04 (C-4), 157.62 (C-5), 99.10 (C-6), 164.54 (C-7), 93.78 (C-8), 157.01 (C-9), 104.40 (C-10), 124.26 (C-1′), 130.18 (C-2′, 6′), 115.62 (C-3′, 5′), 161.98 (C-4′), 98.14 (C-1″), 76.87 (C-2″), 77.44 (C-3″), 69.82 (C-4″), 76.34 (C-5″), 60.56 (C-6″), 100.43 (C-1‴), 70.53 (C-2‴), 70.46 (C-3‴), 71.90 (C-4‴), 68.28 (C-5‴), 18.07 (C-6‴).



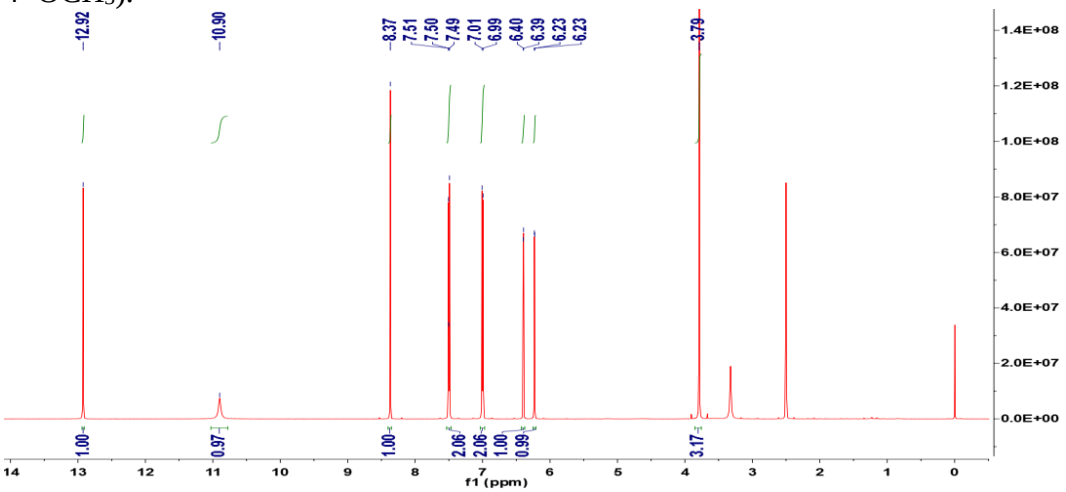
Compound **4:** Q/TOF-MS spectra



Compound **4:** DEPTQSP spectra

S5 : *NMR and mass data and spectra of compound* ***5*** *(Biochanin A)*

ESI-MS (*m/z)*: 283.26 $[M-H]^-$(calcd for $C_{16}H_{12}O_5$). ^1H NMR (600 MHz, DMSO-d_6) δ: 12.92 (1H, s, OH), 10.90 (1H, s, OH), 8.37 (1H, s, H-2), 7.50 (2H, d, J = 9.0 Hz, H-2′, 6′), 7.00 (2H, d, J = 9.0 Hz, H-3′, 5′), 6.39 (1H, d, J = 2.1 Hz, H-6), 6.23 (1H, d, J = 2.1 Hz, H-8), 3.79 (3H, s, 4′-OCH_3).

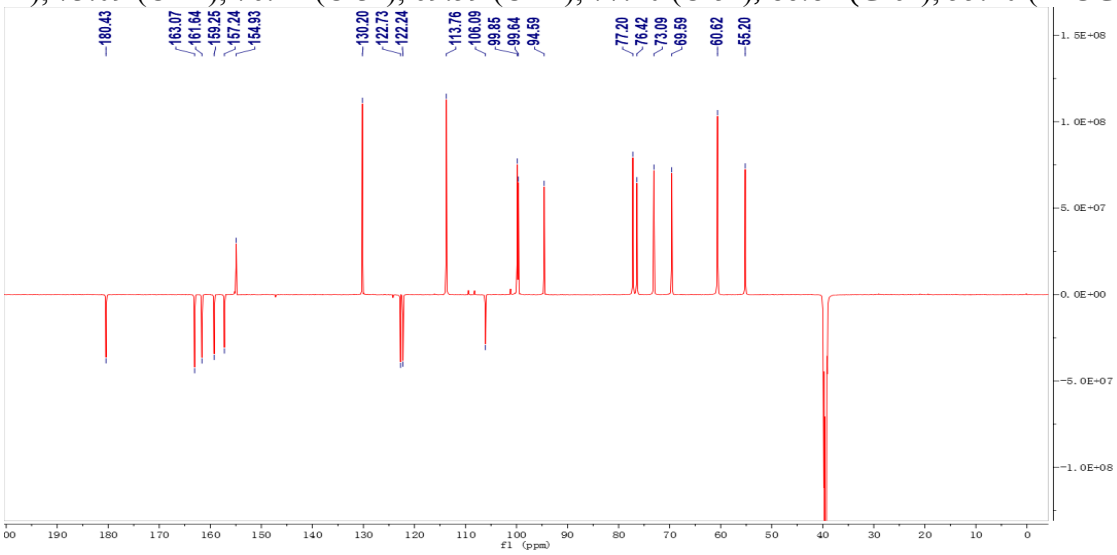


附图 12

Compound **5:** ^1H-NMR spectra

S6 :*NMR and mass data and spectra of compound* ***6*** *(Sissotrin)*

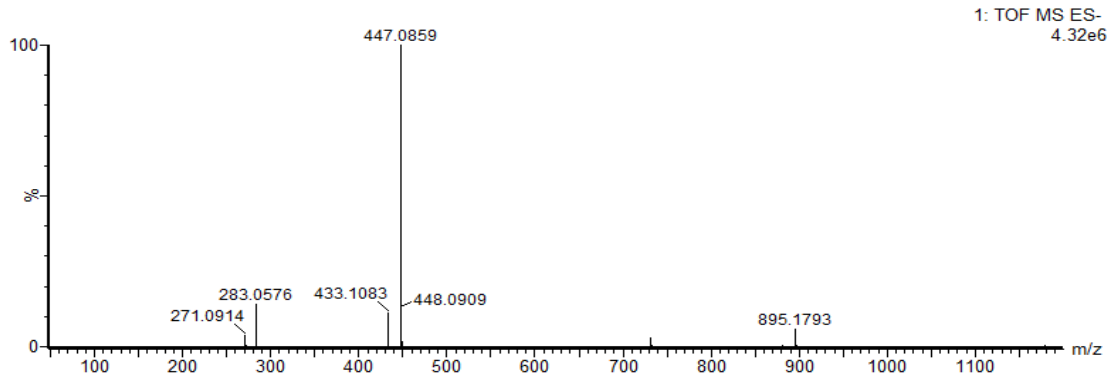
ESI-MS (*m/z)*: 445 $[M-H]^-$(calcd for $C_{22}H_{22}O_{10}$). DEPTQSP (150 MHz, DMSO-d_6) δ: 154.93 (C-2), 122.73 (C-3), 180.43 (C-4), 161.64 (C-5), 99.85 (C-6), 163.07 (C-7), 94.59 (C-8), 157.24 (C-9), 106.09 (C-10), 122.24 (C-1′), 130.20 (C-2′, C-6′), 1.76 (C-3′, C-5′), 159.25 (C-4′), 99.64 (C-1″), 73.09 (C-2″), 76.42 (C-3″), 69.59 (C-4″), 77.20 (C-5″), 60.62 (C-6″), 55.20 (4′-OCH_3).



Compound **6:** DEPTQSP spectra

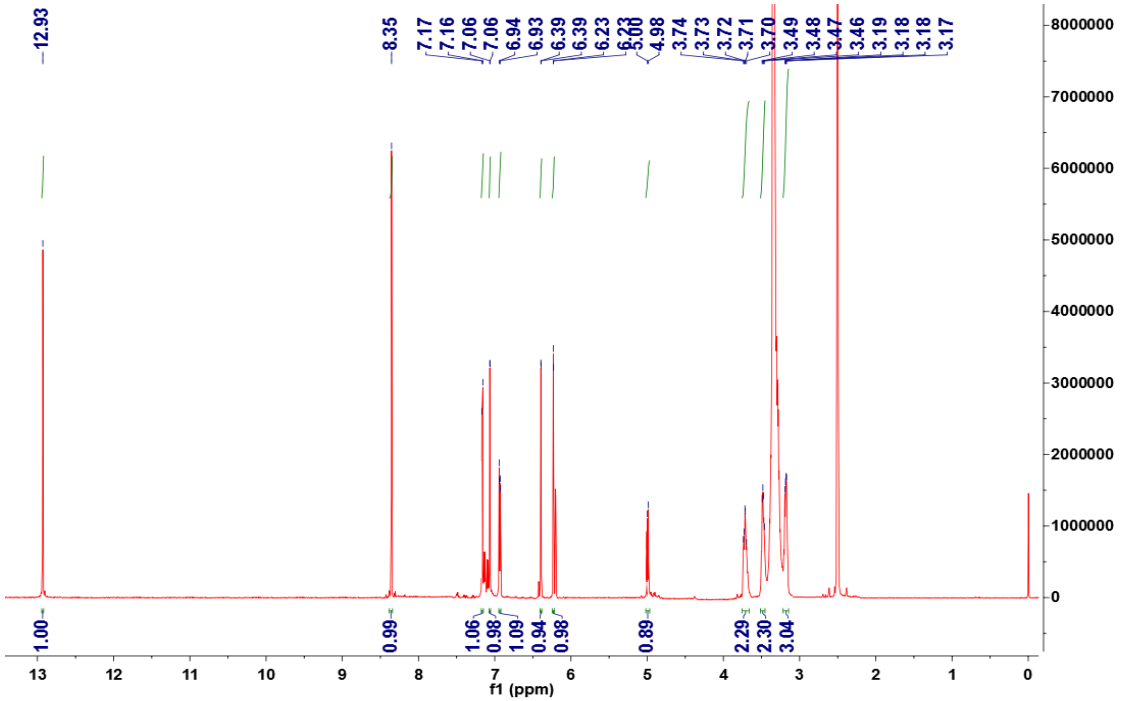
S7 :*NMR and mass data and spectra of compound* ***7*** *(Oroboside)*

Q/TOF-MS (*m/z)*: 447.0859 [M-H]$^-$, (calcd for $C_{21}H_{20}O_{11}$). ^{1}H NMR (600 MHz，DMSO-d_6) δ: 12.93 (1H, s, 5-OH), 8.35 (1H, s, H-2), 7.16 (1H, d, J = 8.4 Hz, H-2′), 7.06 (1H, d, J = 2.1 Hz, H-5′), 6.93 (1H, dd, J = 8.4, 2.1 Hz, H-6′), 6.39 (1H, d, J = 2.0 Hz, H-8), 6.23 (1H, d, J = 2.1 Hz, H-6), 4.99 (1H, d, J = 7.2 Hz, H-1″), 3.71-3.47 (m, other sugar protons). ^{13}C-NMR (150 MHz, DMSO-d_6) δ: 179.95 (C-4), 164.81 (C-7), 161.99 (C- 5), 157.57 (C-9), 154.41 (C-2), 146.47 (C-4′), 145.31 (C-3′), 125.42 (C-3), 121.89 (C-1′), 119.98 (C-6′), 116.70 (C-2′), 116.11 (C-5′), 104.28 (C-10), 102.26 (glc-C-1″), 99.16 (C-6), 93.79 (C-8), 77.25 (glc-C-3″), 75.90 (glc-C- 5″), 73.33 (glc-C-2″), 69.83 (glc-C-4″), 60.77 (glc-C-6″).

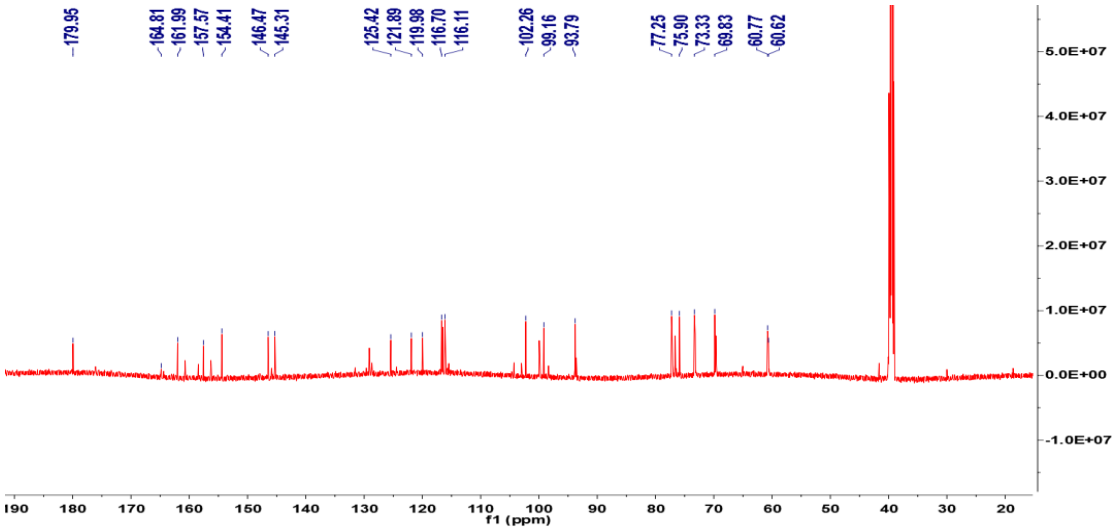


附图

Compound **7:** Q/TOF-MS spectra



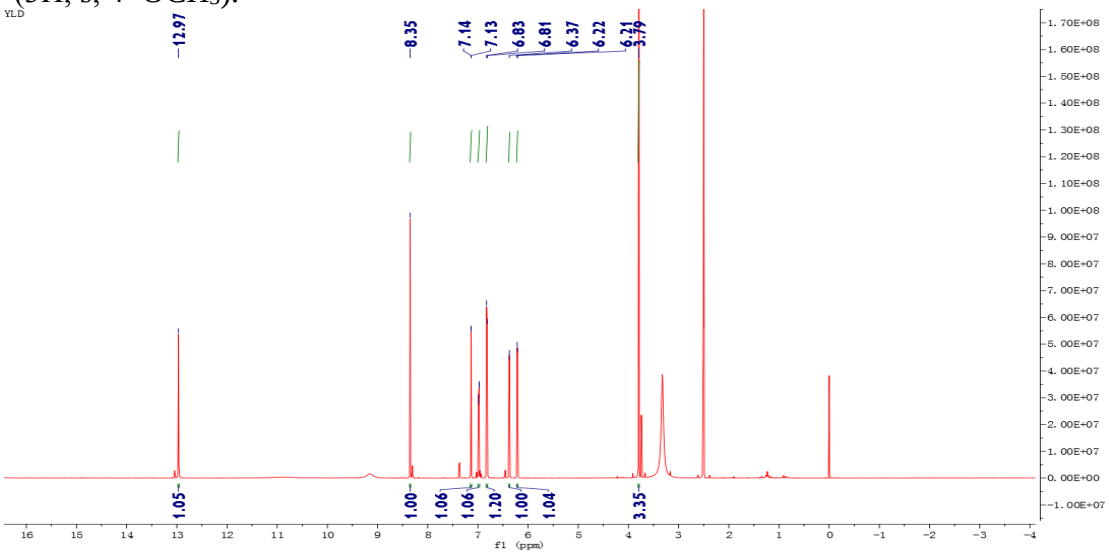
Compound **7:** ^{1}H-NMR spectra



Compound **7:** ^{13}C-NMR spectra

S8 :*NMR and mass data and spectra of compound* ***8*** *(Pratensein)*

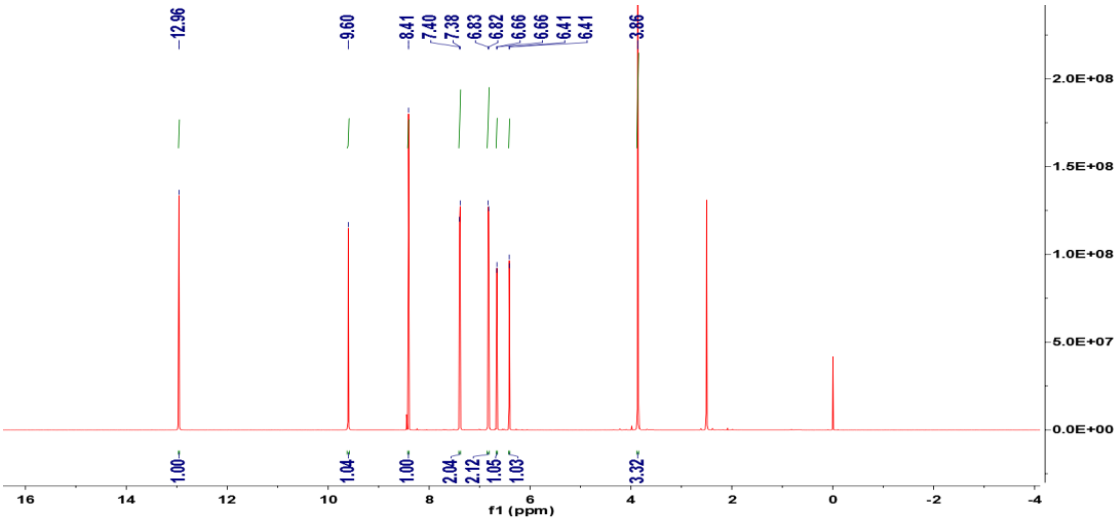
ESI-MS (*m/z)*: 299.0530 $[M-H]^-$(calcd for $C_{16}H_{12}O_6$). ^1H NMR (600 MHz, DMSO-d_6) δ: 12.97 (1H, s, OH), 8.35 (1H, s, H-2), 7.14 (1H, d, *J* = 2.1 Hz, H-2′), 6.98 (1H, dd, *J* = 8.4, 2.1 Hz, H-6′), 6.82 (1H, d, *J* = 8.4 Hz, H-5′), 6.37 (1H, d, *J* = 2.1 Hz, H-8), 6.21 (1H, d, *J* = 2.1 Hz, H-6), 3.79 (3H, s, 4′-OCH_3).



Compound **8:** ^1H-NMR spectra

S9 :*NMR and mass data and spectra of compound* ***9*** *(Prunetin)*

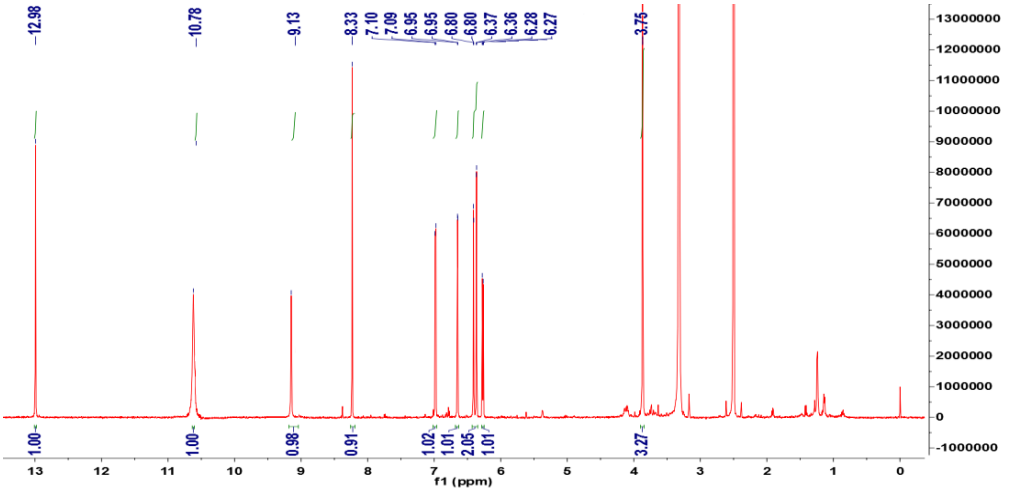
ESI-MS (*m/z*): 283.26 $[M-H]^-$, (calcd for $C_{16}H_{12}O_5$). ^1H NMR (600 MHz， DMSO-d_6) δ: 12.96 (1H, s, 5-OH), 9.60 (H, s, 4′-OH), 8.41 (1H, s, H-2), 7.39 (2H, d, J = 8.4 Hz, H-2′, 6′), 6.82 (2H, d, J = 8.4 Hz, H-3′, 5′), 6.66 (1H, d, J = 2.4 Hz, H-8), 6.41 (1H, d, J = 2.4 Hz, H-6), 3.86 (3H, s, 7-OCH_3).



Compound **9:** ^1H-NMR spectra

S10 :*NMR and mass data and spectra of* compound **10** (3'-methylorobol)

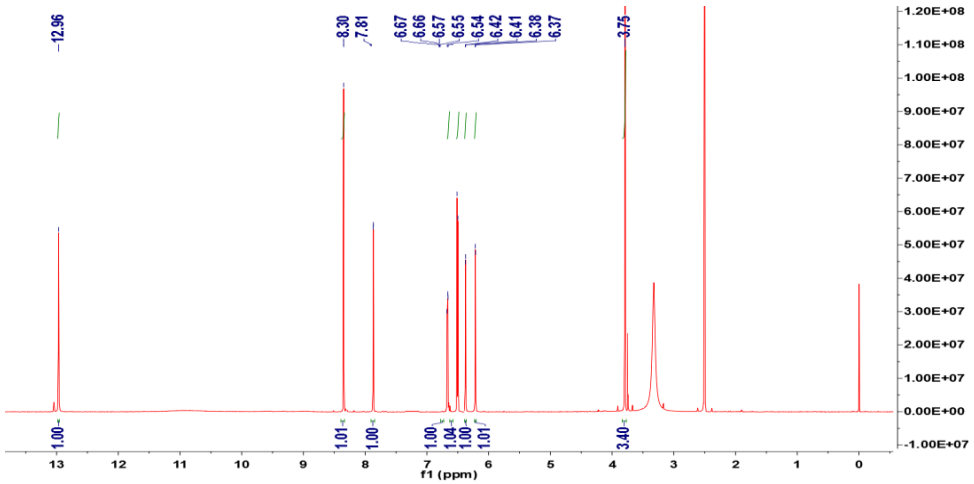
ESI-MS (*m/z*): 299.26 $[M-H]^-$, (calcd for $C_{16}H_{12}O_6$). ^1H NMR (600 MHz， DMSO-d_6) δ 12.98 (1H, s, 5-OH), 10.78 (1H, s, 7-OH), 9.13 (1H, s, 4′-OH), 8.33 (1H, s, H-2), 7.10 (1H, d, J = 2.4 Hz, H-2′), 6.95 (1H, dd, J = 8.4, 2.4 Hz, H-6′), 6.80 (1H, d, J = 8.4 Hz, H-5′), 6.36 (1H, d, J = 2.4 Hz, H-8), 6.27 (1H, d, J = 2.4 Hz, H-6), 3.75 (3H, s, 3′-OCH_3).



Compound **10:** ^1H-NMR spectra

S11 :*NMR and mass data and spectra of compound* ***11*** *(Dehydroferreirin)*

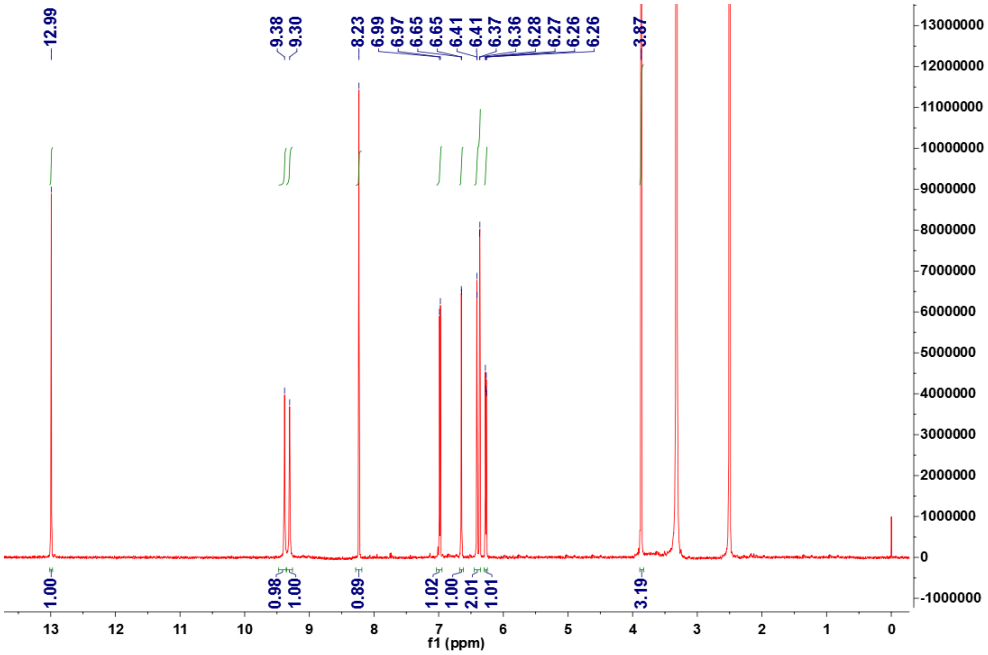
ESI-MS (*m/z*): 299.06 [M-H]$^-$(calcd for $C_{16}H_{12}O_6$). ^{1}H NMR (600 MHz，DMSO-d_6) δ: 12.96 (1H, s, 5-OH), 8.30 (1H, s, H-2), 7.81 (1H, d, *J* = 8.4 Hz, H-6′), 6.66 (1H, d, *J* = 2.4 Hz, H-8), 6.55 (1H, dd, *J* = 2.4, 8.4 Hz, H-5′), 6.42 (1H, d, *J* = 2.4 Hz, H-6), 6.38 (1H, d, *J* = 2.4 Hz, H-3′), 3.75 (3H, s, 4′-OCH_3).



Compound **11:** ^{1}H-NMR spectra

S12 :*NMR and mass data and spectra of compound* ***12*** *(Cajanin)*

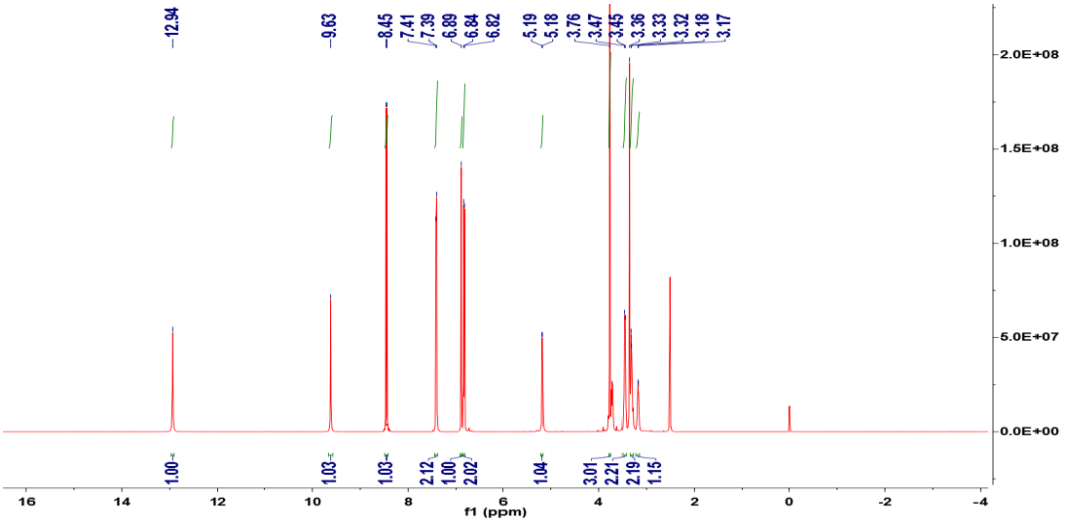
ESI-MS (*m/z*): 299.06 $[M-H]^-$(calcd for $C_{16}H_{12}O_6$). ^1H NMR (600 MHz，DMSO-d_6) δ: 12.99 (1H, s, OH), 9.38 (1H, s, 4′-OH), 9.30 (1H, s, 2′-OH), 8.23 (1H, s, H-2), 6.98 (1H, d, *J* = 8.4 Hz, H-6′), 6.65 (1H, d, *J* = 2.1 Hz, H-8), 6.42 (1H, d, *J* = 2.4 Hz, H-6), 6.38 (1H, d, *J* = 2.4 Hz, H-3′), 6.27 (1H, dd, *J* = 8.4, 2.4 Hz, H-5′), 3.87 (3H, s, 7′-OCH_3).



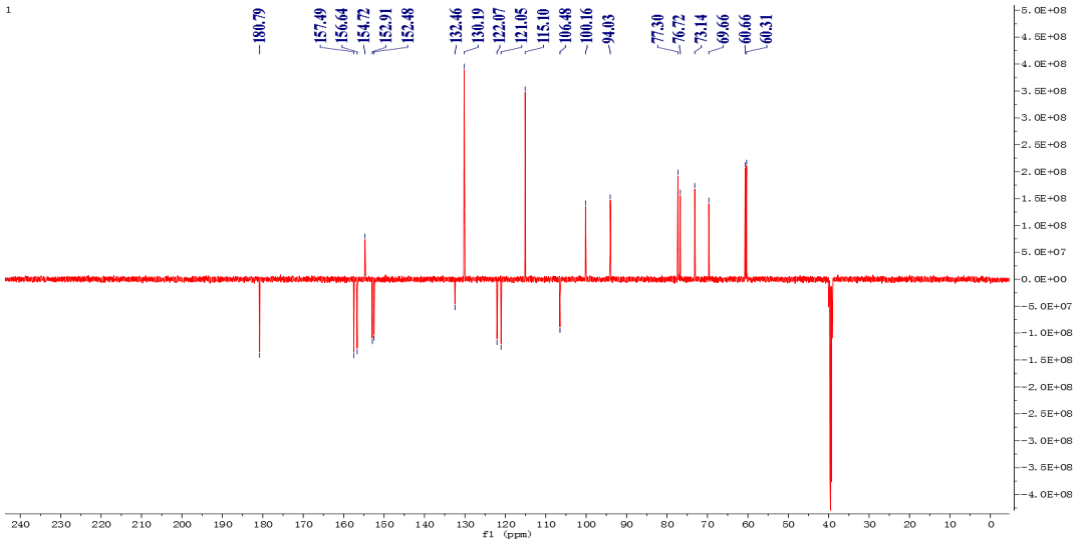
Compound **12:** ^1H-NMR spectra

S13:*NMR and mass data and spectra of compound* ***13*** *(Tectoridin)*

ESI-MS (*m/z*): 461[M-H]$^-$, (calcd for $C_{22}H_{22}O_{11}$). ^{1}H NMR (500 MHz, DMSO-d_6) δ: 12.94 (1H, s, 5-OH)，9.63 (1H, s, 4′-OH)，8.45 (1H, s, H-2)，7.40 (2H, d, *J*= 8.6 Hz,H-2′,6′), 6.89 (1H, s, H-8)，6.83 (2H, d, *J*= 8.6 Hz, H-3′,5′), 3.76 (3H, s，6-OCH_3), 5.18 (1H, d, *J*=4.5 Hz, H-1″), 3.17-3.47 (m, other sugar protons)；DEPTQSP (125 MHz, DMSO-d_6) δ: 180.79 (C-4), 157.49 (C-4′), 156.64 (C-7), 154.72 (C-9), 152.91 (C-2), 152.48 (C-5), 132.46 (C-6), 130.19 (C-2′, 6′), 122.07 (C-1′)，121.05 (C-3)，115.10 (C-3′, 5′)，106.48 (C-10)，94.03 (C-8)，60.31 (6-OCH_3)，100.16 (C-1″)，73.14 (C-2″)，77.30 (C-3″)，69.66 (C-4″)，76.72 (C-5″)，60.66 (C-6″).



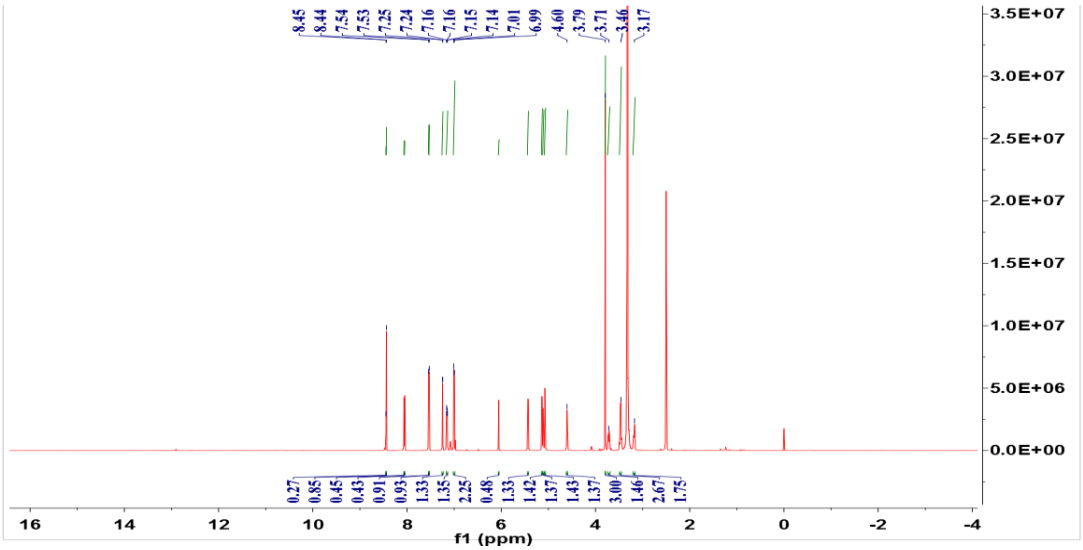
Compound **13:** ^{1}H-NMR spectra



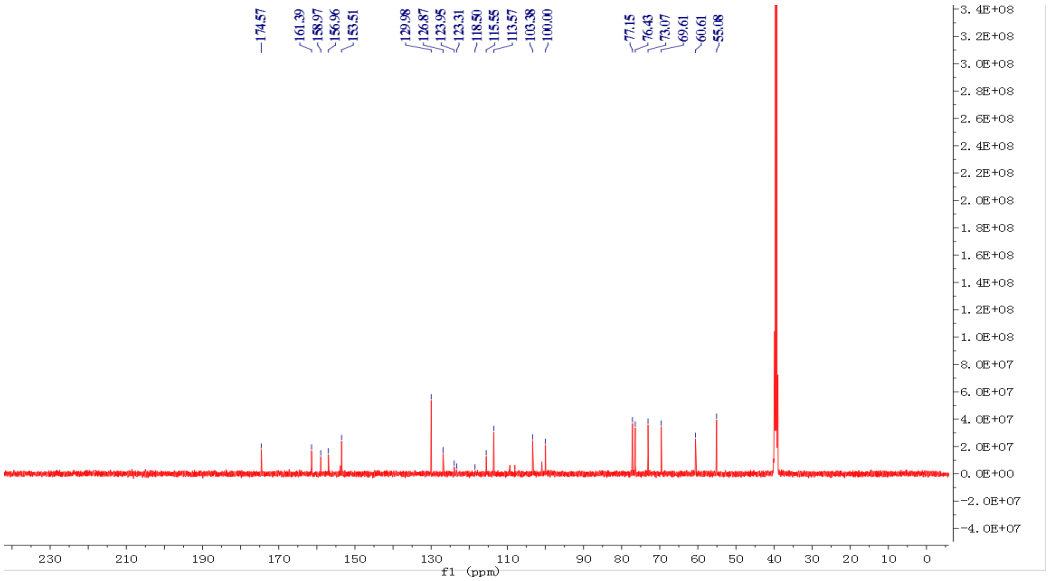
Compound **13:** DEPTQSP spectra

S14 :*NMR and mass data and spectra of compound* ***14*** *(Ononin)*

ESI-MS (*m/z*): 429 $[M-H]^-$, (calcd for $C_{22}H_{22}O_9$). ^1H NMR (600 MHz, DMSO-d_6) δ 8.44 (1H, s, H-2), 8.06 (1H, d, *J*= 9.0 Hz, H-5), 7.53 (2H, d, *J*= 8.7 Hz, H-2′, 6′), 7.24 (1H, d, *J*= 2.1 Hz, H-8), 7.15 (1H, dd, *J*= 9.0, 2.1 Hz, H-6), 7.00 (2H, d, *J*= 8.7 Hz, H-3′,5′), 3.79 (3H, s, 4′-OCH_3), 5.11 (1H, d, *J* = 7.3 Hz, H-1″), 3.17-3.46 (m, other sugar protons)； DEPTQSP (150 MHz, DMSO-d_6) δ: 174.80 (C-4), 161.53 (C-7), 159.12 (C-4′), 157.14 (C-9), 153.75 (C-2), 130.18 (C-2′, 6′), 127.07 (C-5), 124.07 (C-3), 123.47 (C-1′), 118.53 (C-10), 115.74 (C-6), 113.73 (C-3′, 5′), 103.49 (C-8), 100.05 (glc-C-1″), 77.27 (C-5″), 76.53 (C-3″), 73.20 (C-2″), 69.71 (C-4″), 60.72 (C-6″), 55.23 (4′-OCH_3).



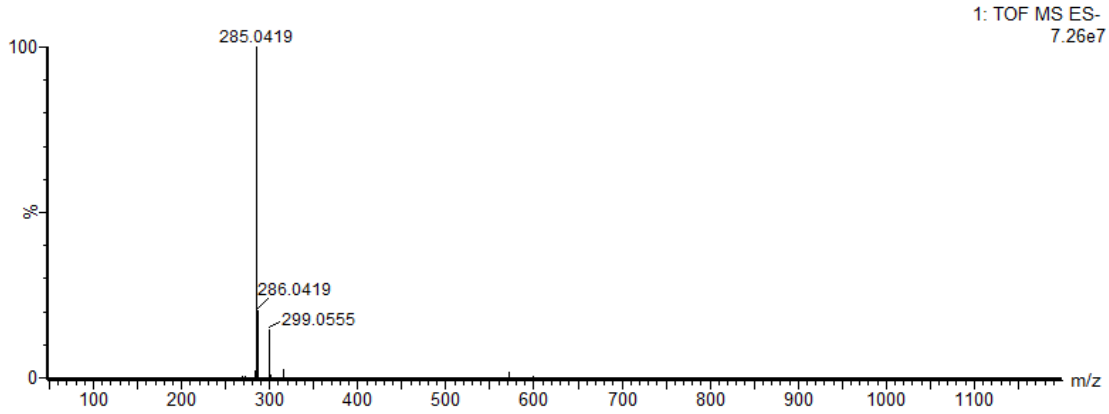
Compound **14:** ^1H-NMR spectra



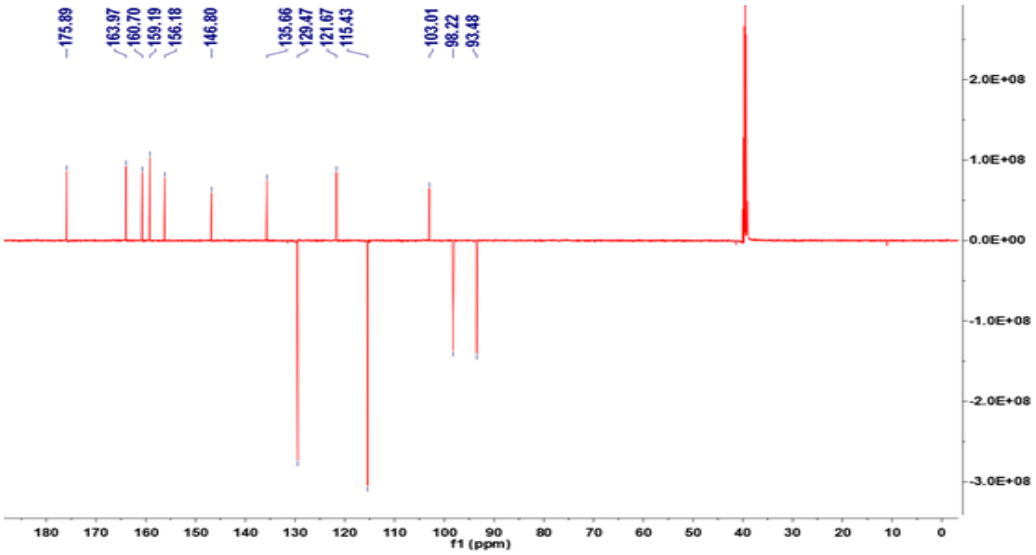
Compound **14:** ^{13}C-NMR spectra

S15 :*NMR and mass data and spectra of compound 15 (Kaempferol)*

Q/TOF-MS (*m/z*): 285.0419 [M-H]$^-$, (calcd for $C_{15}H_{10}O_6$). DEPTQSP (125 MHz, DMSO-d_6) δ: 146.80 (C-2), 135.66 (C-3), 175.89 (C-4), 160.70 (C-5), 98.22 (C-6), 163.97 (C-7), 93.48 (C-8), 156.18 (C-9), 103.02 (C-10), 121.67 (C-1′), 129.47 (C-2′, 6′), 115.43 (C-3′, 5′), 159.19 (C-4′).



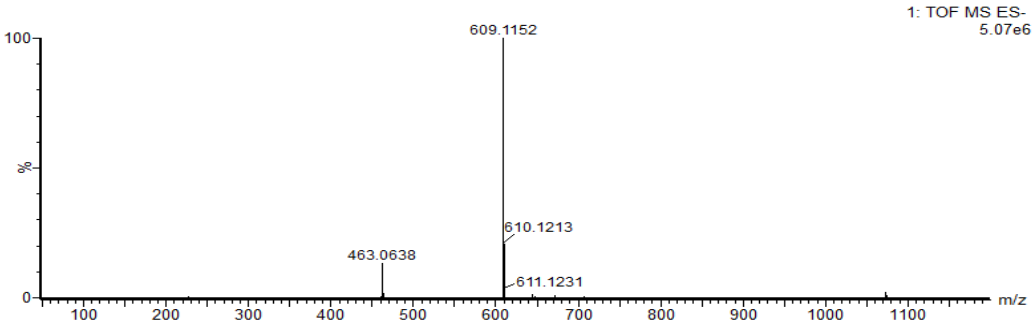
Compound **15:** Q/TOF-MS spectra



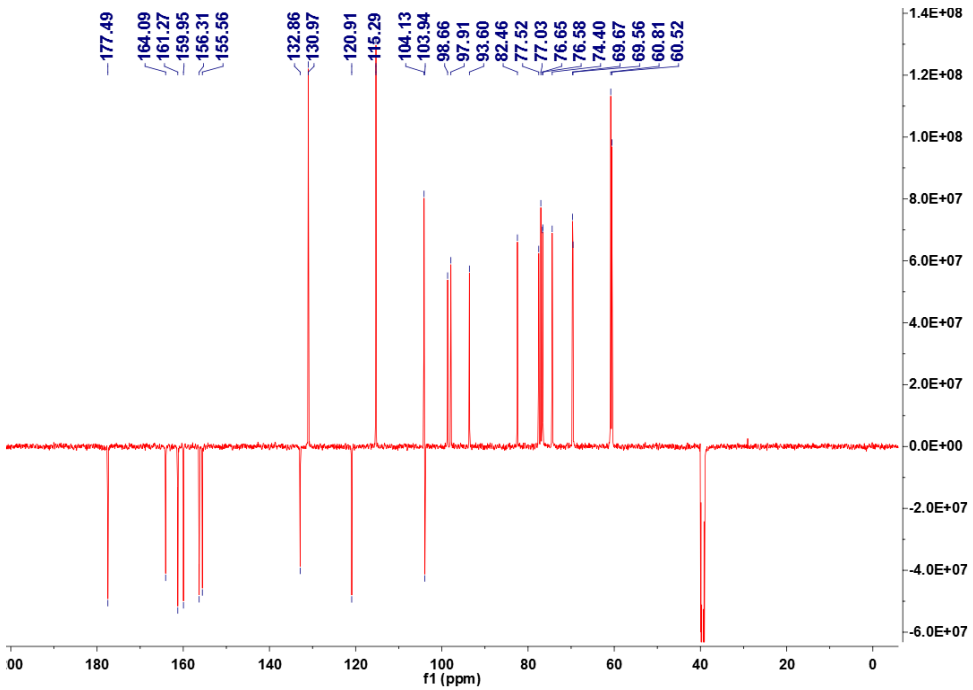
Compound **15:** DEPTQSP spectra

S16 :*NMR and mass data and spectra of compound* ***16*** *(Sophoraflavonoloside)*

Q/TOF-MS (*m/z*): 609.1152 [M-H]$^-$, (calcd for $C_{27}H_{30}O_{16}$). DEPTQSP (125 MHz, DMSO-d_6) δ: 156.31 (C-2), 132.86 (C-3), 177.49 (C-4), 161.27 (C-5), 98.66 (C-6), 164.09 (C-7), 93.60 (C-8), 155.56 (C-9), 103.94 (C-10), 120.91 (C-1′), 0.97 (C-2′, 6′), 115.29 (C-3′, 5′), 159.95 (C-4′), 97.91 (C-1″), 82.46 (C-2″), 77.52 (C-3″), 69.67 (C-4″), 77.03 (C-5″), 60.81 (C-6″), 104. (C-1‴), 74.40 (C-2‴), 76.65 (C-3‴), 69.56 (C-4‴), 76.58 (C-5‴), 60.52 (C-6‴).



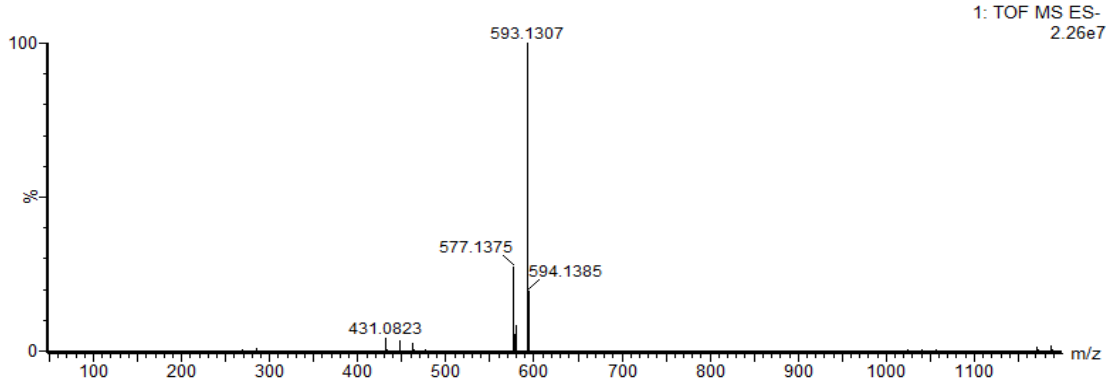
Compound **16:** Q/TOF-MS spectra



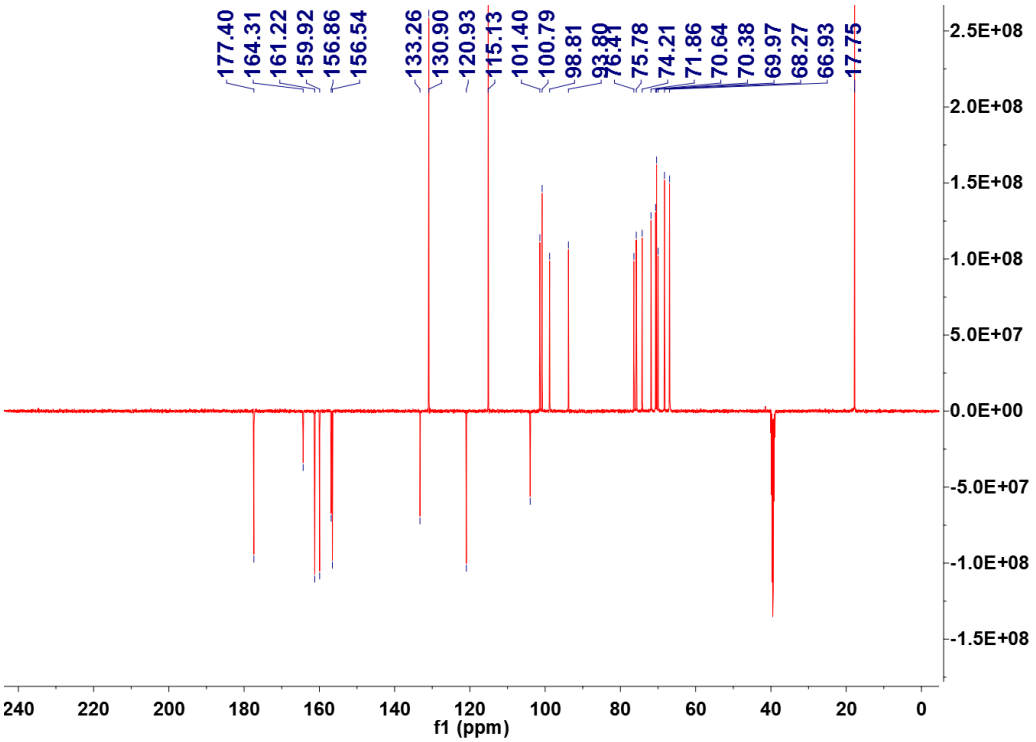
Compound **16:** DEPTQSP spectra

S17 :*NMR and mass data and spectra of compound* ***17*** *(Nicotiflorin)*

Q/TOF-MS (*m/z*): 593.1307 [M-H]$^-$, (calcd for $C_{27}H_{30}O_{15}$). DEPTQSP (125 MHz, DMSO-d_6) δ: 156.86 (C-2), 133.26 (C-3), 177.40 (C-4), 161.22 (C-5), 98.81 (C-6), 164.31 (C-7), 93.80 (C-8), 156.54 (C-9), 103.97 (C-10), 120.93 (C-1′), 130.90 (C-2′, C-6′), 115.13 (C-3′, C-5′), 159.92(C-4′), 101.40 (C-1″), 74.21 (C-2″), 76.41 (C-3″), 70.64 (C-4″), 75.78 (C-5″), 66.93 (C-6″), 100.79 (C-1‴), 71.86 (C-2‴), 69.97 (C-3‴), 70.38 (C-4‴), 68.27 (C-5‴), 17.75 (C-6‴).



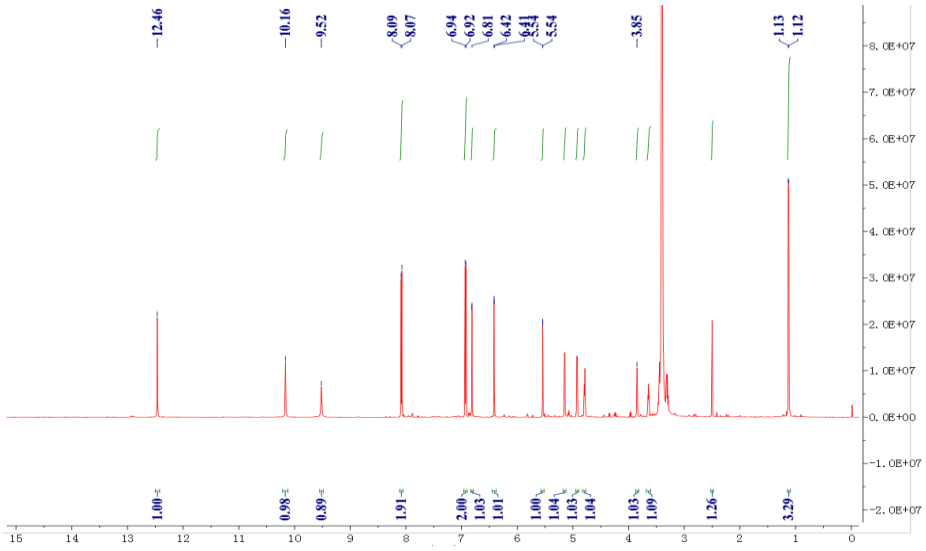
Compound **17:** Q/TOF-MS spectra



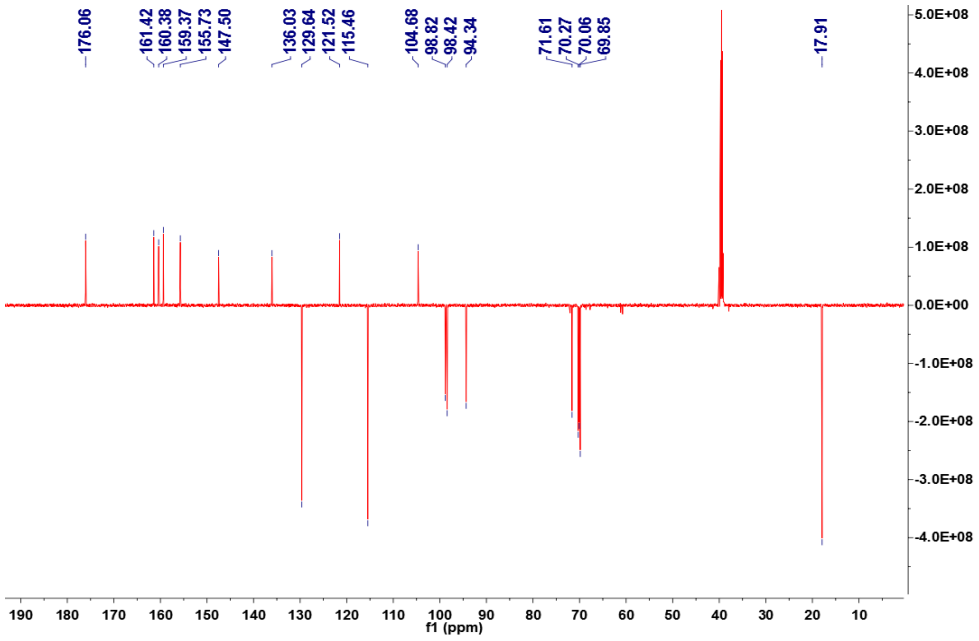
Compound **17:** DEPTQSP spectra

S18 :*NMR and mass data and spectra of compound* ***18*** *(α-rhamnoisorobin)*

ESI-MS (*m/z*)：431 $[M-H]^-$ (calcd for $C_{21}H_{20}O_{10}$). ^1H NMR (600 MHz, DMSO-d_6) δ: 12.46 (1H, s, 5-OH), 10.16 (1H, s, 3-OH), 9.52 (1H, s, 4'-OH), 8.08 (2H, d, J = 8.9 Hz, H-2′, H-6′), 6.93 (2H, d, J = 8.9 Hz, H-3′, H-5′), 6.81 (1H, d, J = 2.1 Hz, H-8), 6.41 (1H, d, J = 2.1 Hz, H-6), 5.54 (1H, d, J = 1.4 Hz, H-1″), 3.85 (1H, s, H-5″), 1.13 (3H, d, J = 6.2 Hz, 5″C-H_3); DEPTQSP (150 MHz, DMSO-d_6) δ: 176.06 (C-4), 161.42 (C-7), 160.38 (C-5), 159.37 (C-4′), 155.73 (C-9), 147.5(C-2), 136.03 (C-3), 129.64 (C-2′, C-6′), 121.52 (C-1′), 115.46 (C-3′, C-5′), 104.68 (C-10), 98.82 (C-6), 98.42 (C-1″), 94.34 (C-8), 71.61 (C-4″), 70.27 (C-3″), 70.06 (C-2″), 69.85 (C-5″), 17.91 (C-6″).



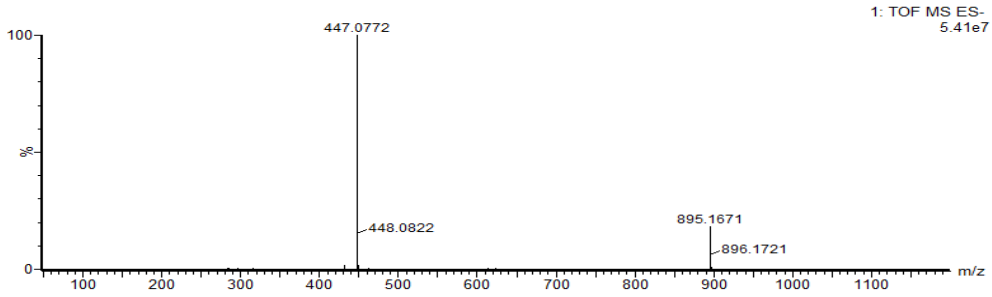
Compound **18:** ^1H-NMR spectra



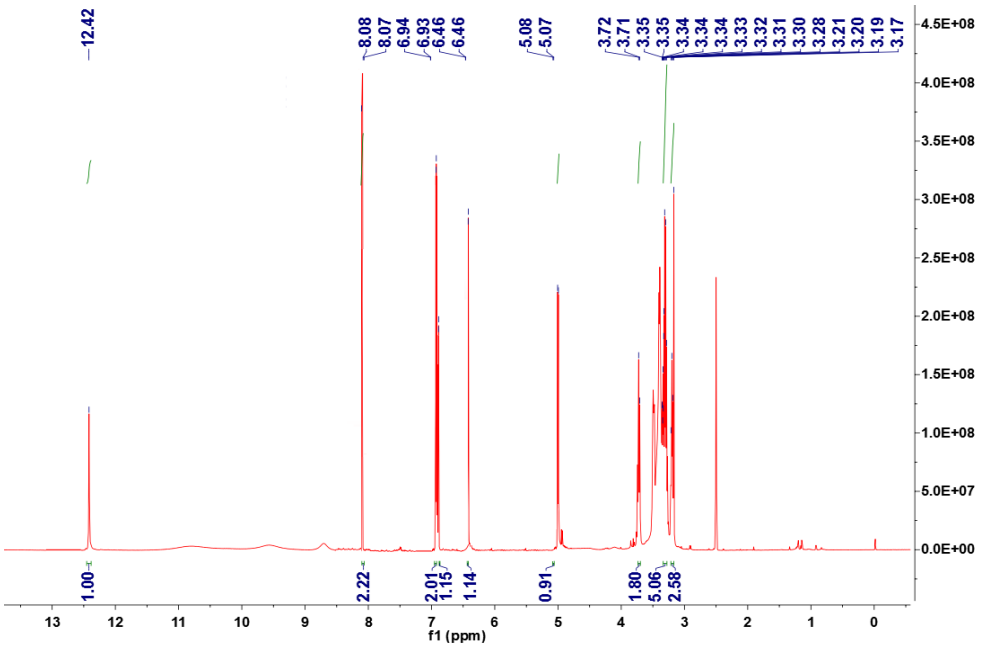
Compound **18:** DEPTQSP spectra

S19 :*NMR and mass data and spectra of compound* ***19*** *(Populnin)*

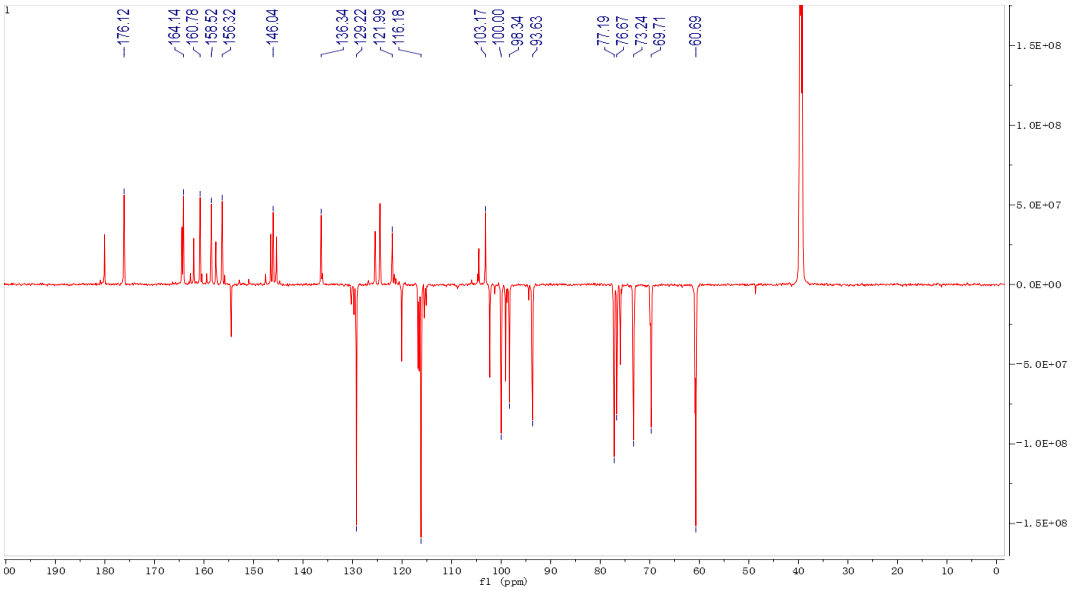
Q/TOF-MS (*m/z*): 447.0772 [M-H]$^-$, (calcd for $C_{21}H_{20}O_{11}$). ^{1}H NMR (600 MHz, DMSO-d_6) δ: 12.42 (1H, s, 5-OH), 8.07 (2H, d, J = 8.9 Hz, H-2', 6'), 6.93 (2H, d, J =8.4 Hz, H-3′, 5′), 6.80 (1H, d, J = 2.1 Hz, H-8), 6.46 (1H, d, J = 2.0 Hz, H-6), 5.07 (1H, d, J = 7.5 Hz, H-1″), 3.20-3.72 (m, other sugar protons); DEPTQSP (150 MHz, DMSO-d_6) δ: 147.58 (C-2), 136.34 (C-3), 176.12 (C-4), 160.78 (C-5), 98.34 (C-6), 162.05 (C-7), 93.63 (C-8), 155.81 (C-9), 103.17 (C-10), 121.99 (C-1'), 129.22 (C-2', 6'), 116.18 (C-3', 5'), 159.44(C-4'), 100.00 (C-1″), 73.24 (C-2″), 77.19 (C-3″), 69.71 (C-4″), 76.67 (C-5″), 60.69 (C-6″).



Compound **19:** Q/TOF-MS spectra



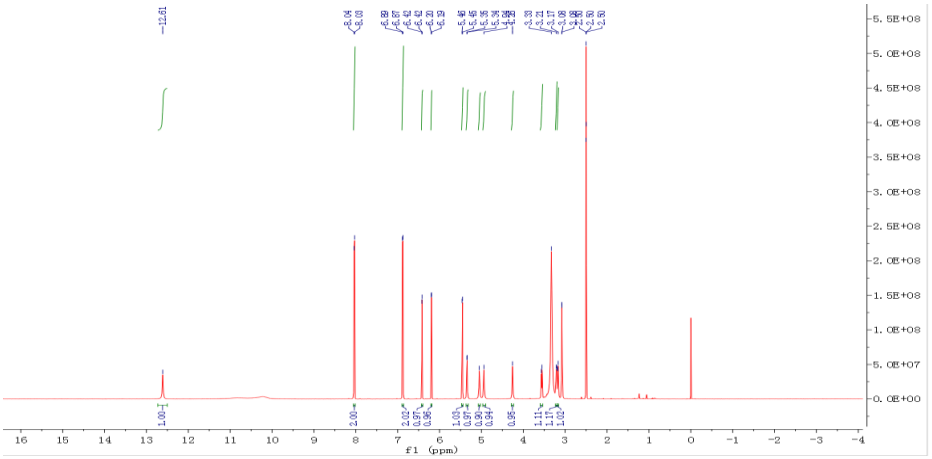
Compound **19:** ^{1}H-NMR spectra



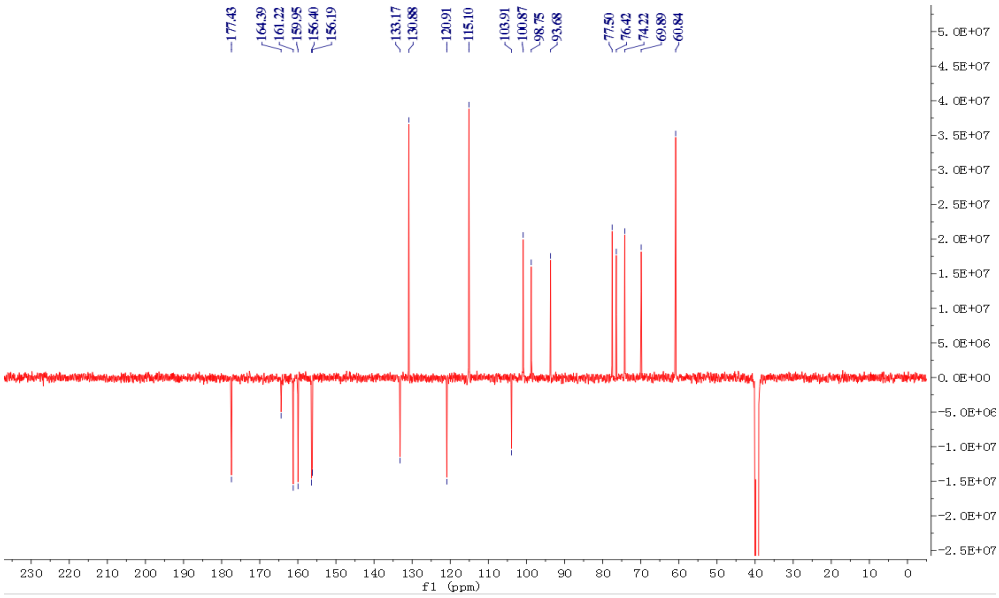
Compound **19:** DEPTQSP spectra

S20 :*NMR and mass data and spectra of compound* ***20*** *(Astragalin)*

Q/TOF-MS (*m/z*): 471 [M-H]$^-$, (calcd for $C_{21}H_{20}O_{10}$). ^{1}H NMR (600 MHz，DMSO-d_6) δ 12.61 (1H, s, 5-OH), 8.04 (2H, d, J = 8.8 Hz, H-2′, 6′), 6.88 (2H, d, J = 8.8 Hz, H-3′, 5′), 6.42 (1H, d, J = 1.8 Hz, H-8), 6.19 (1H, d, J = 1.8 Hz, H-6), 5.46 (1H, d, J = 7.6 Hz, H-1″); DEPTQSP (150 MHz, DMSO-d_6) δ 177.42 (C-4), 164.39 (C-7), 161.21 (C-5), 159.95 (C-4′), 156.40 (C-2), 156.19 (C-9), 133.16 (C-3), 130.88 (C-2′, 6′), 120.90 (C-1′), 115.10 (C-3′, 5′), 103.91 (C-10), 100.86 (C-1″), 77.50 (C-5″), 76.42 (C-3″), 74.21 (C-2″), 69.89 (C-4″), 60.83 (C-6″).



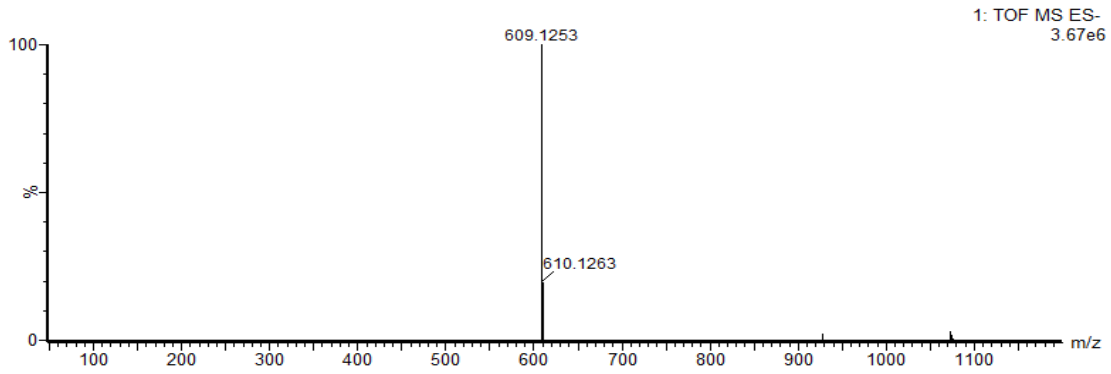
Compound **20:** ^{1}H-NMR spectra



Compound **20:** DEPTQSP spectra

S21 :*Mass data and spectra of compound* ***21*** *(Rutin)*

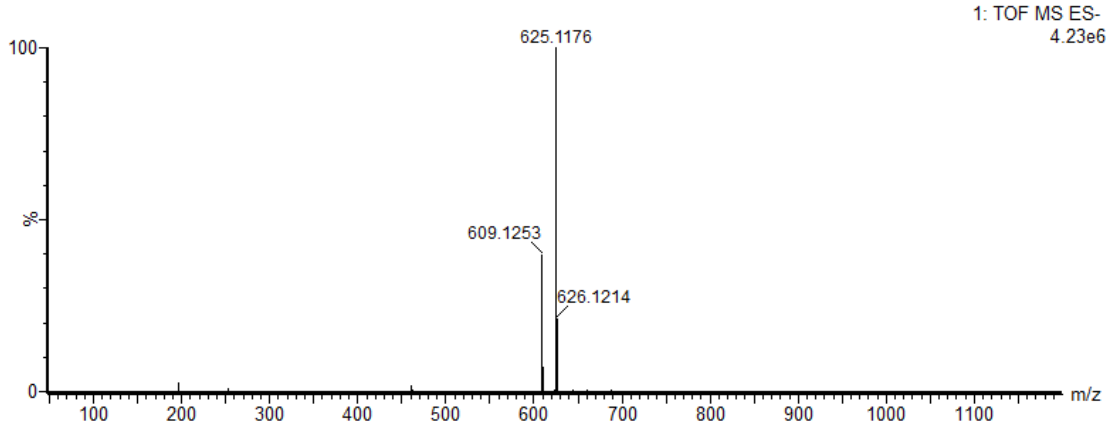
Q/TOF-MS (*m/z*): 609.1253 [M-H]$^-$, (calcd for $C_{27}H_{30}O_{17}$). Using TLC method to compare the compound **21** with rutin control samples. The results showed that under three different expansion systems, the RF values these two samples were consistent. Combined with Q/TOF-MS result, the compound was identified as rutin.



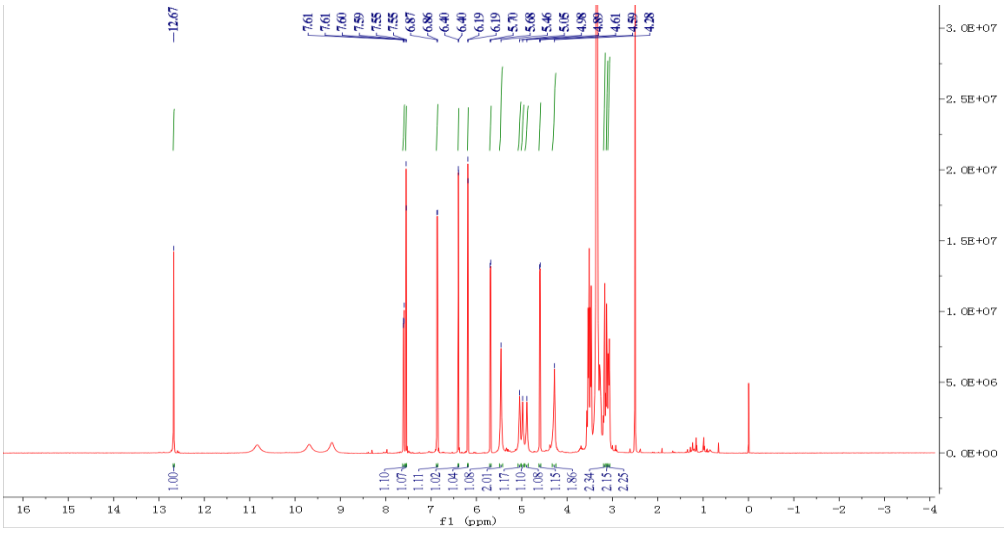
Compound **21:** Q/TOF-MS spectra

S22 :*NMR and mass data and spectra of compound* ***22*** *(Quercetin-3-O-β-D-sophoroside)*

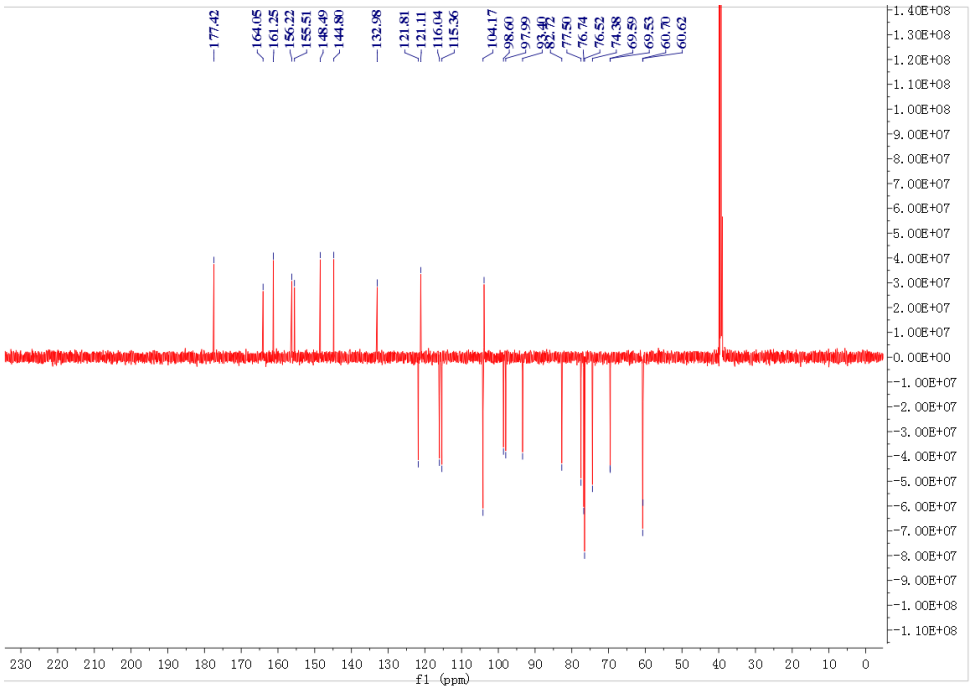
Q/TOF-MS (*m/z*): 625.1176 [M-H]$^-$，(calcd for $C_{27}H_{30}O_{17}$), ^{1}H NMR (500 MHz，DMSO-d_6) δ：12.67 (1H, s, 5-OH), 10.84 (1H, s, 7-OH), 9.69 (1H, s, 4′-OH), 9.19 (1H, s, 3′-OH), 7.60 (1H, dd, *J* = 8.5, 2.2 Hz, H-6′), 7.55 (1H, d, *J* = 2.2 Hz, H-2′), 6.87 (1H, d, *J* = 8.5 Hz, H-5′)，6.40 (1H, d, *J* = 2.0 Hz, H-8), 6.19 (1H, d, *J* = 2.0 Hz, H-6), 5.69 (1H, d, *J* = 7.5 Hz, H-1″), 4.60 (1H, d, *J* = 7.8 Hz, H-1‴), 3.58-3.04 (m, other sugar protons); DEPTQSP (125 MHz, DMSO-d_6) δ: 177.42 (C-4), 164.05 (C-7), 161.25 (C-5), 156.22 (C-2), 155.51 (C-9), 148.49 (C-4′), 144.80 (C-3′), 132.98 (C-3), 121.81 (C-6′), 121.11 (C-1′), 116.04 (C-5′), 115.36 (C-2′), 103.89 (C-10), 104.17 (C-1″), 98.60 (C-1‴), 97.99 (C-6), 93.40 (C-8), 82.72 (C-2″), 77.50 (C-5‴), 76.74 (C-3″), 76.52 (C-5″), 76.52 (C-3‴), 74.38 (C-2‴), 69.59 (C-4″), 69.53 (C-4‴), 60.70 (C-6″), 60.62 (C-6‴).



Compound **22:** Q/TOF-MS spectra



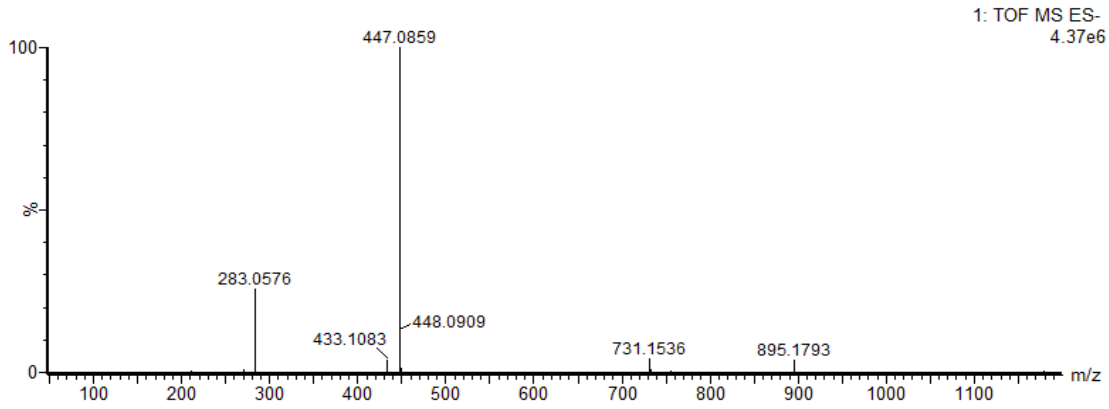
Compound **22:** ^{1}H-NMR spectra



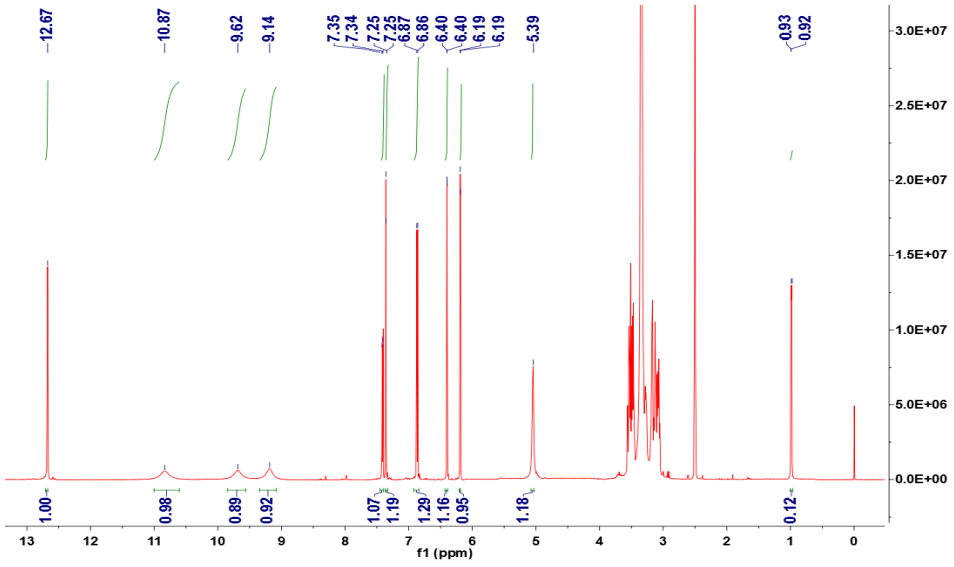
Compound **22:** DEPTQSP spectra

S23 :*NMR and mass data and spectra of compound* ***23*** *(Quercitrin)*

Q/TOF-MS (*m/z*): 447.0859 [M-H]$^-$, (calcd for $C_{21}H_{20}O_{11}$). ^{1}H NMR (500 MHz, DMSO-d_6) δ: 12.67 (1H, s, 5-OH), 10.87 (1H, s, 7-OH), 9.62 (1H, s, 4'-OH), 9.14 (1H, s, 3'-OH), 7.35 (1H, d, J = 2.2 Hz, H-2′), 7.25 (1H, dd, J = 8.5, 2.0 Hz, H-6′), 6.87 (1H, d, J = 8.5 Hz, H-5′), 6.40 (1H, d, J = 2.0 Hz, H-8), 6.19 (1H, d, J = 2.0 Hz, H-6), 5.39 (1H, brs, H-1″), 0. 92 (3H, d, J = 6.2 Hz, CH_3-5″).



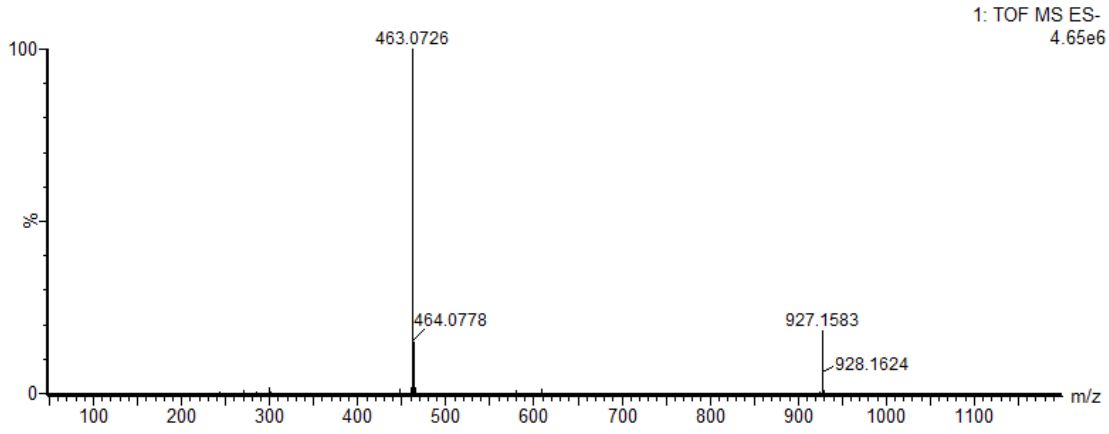
Compound **23:** Q/TOF-MS spectra



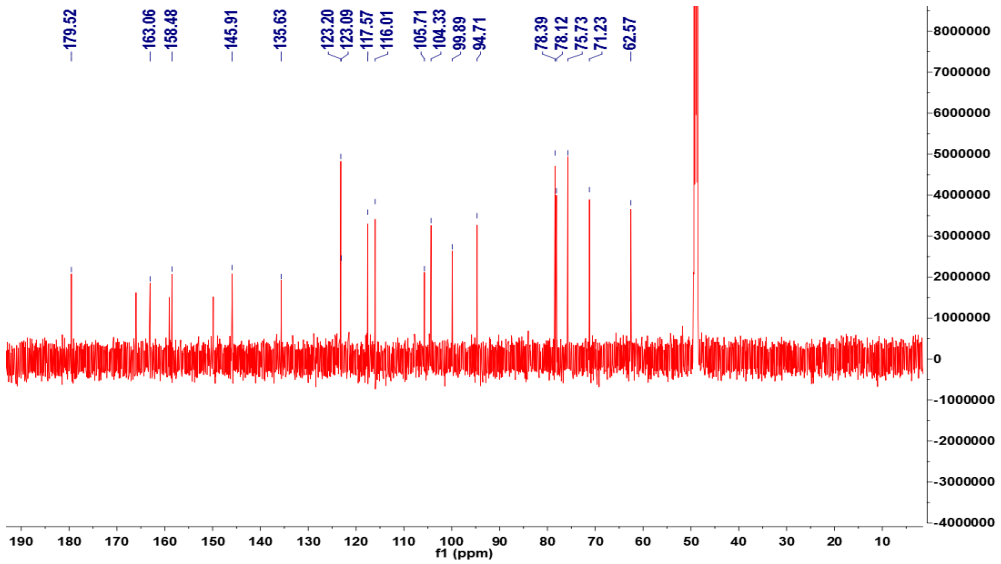
Compound **23:** ^{1}H-NMR spectra

S24 :*NMR and mass data and spectra of compound* ***24*** *(Isoquercitrin)*

ESI-MS m/z: 463 $[M-H]^-$, ^{13}C NMR (150 MHz，CD_3OD) δ 179.52 (C-4), 166.00 (C-5), 163.06 (C-7), 159.05 (C-2), 158.48 (C-9), 149.85 (C-4′), 145.91(C-3′), 135.63 (C-3), 123.20 (C-1′), 123.09 (C-6′), 117.57 (C-5′), 116.01 (C-2′), 105.71 (C-10), 104.33 (Glc-C-1″), 99.89 (C-6), 94.71 (C-8), 78.39 (Glc-C-4″), 78.12 (Glc-C-3″), 75.73 (Glc-C-2″), 71.23 (Glc-C-4″), 62.57 (Glc-C-6″).



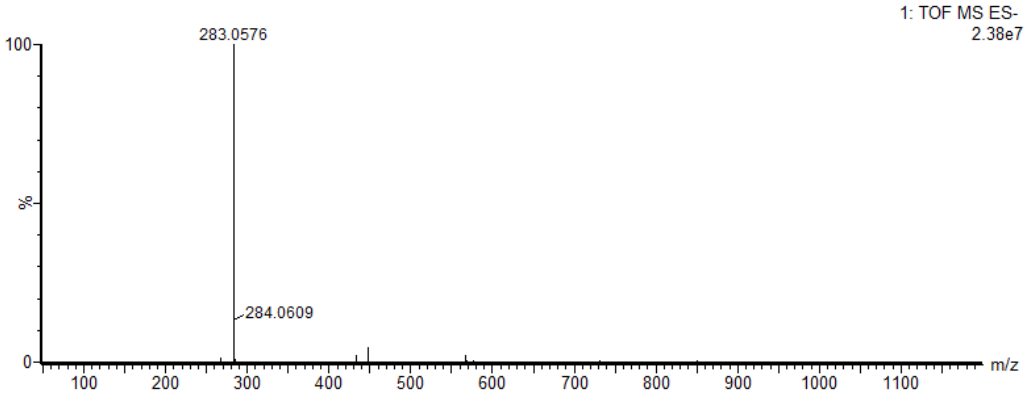
Compound **24:** Q/TOF-MS spectra



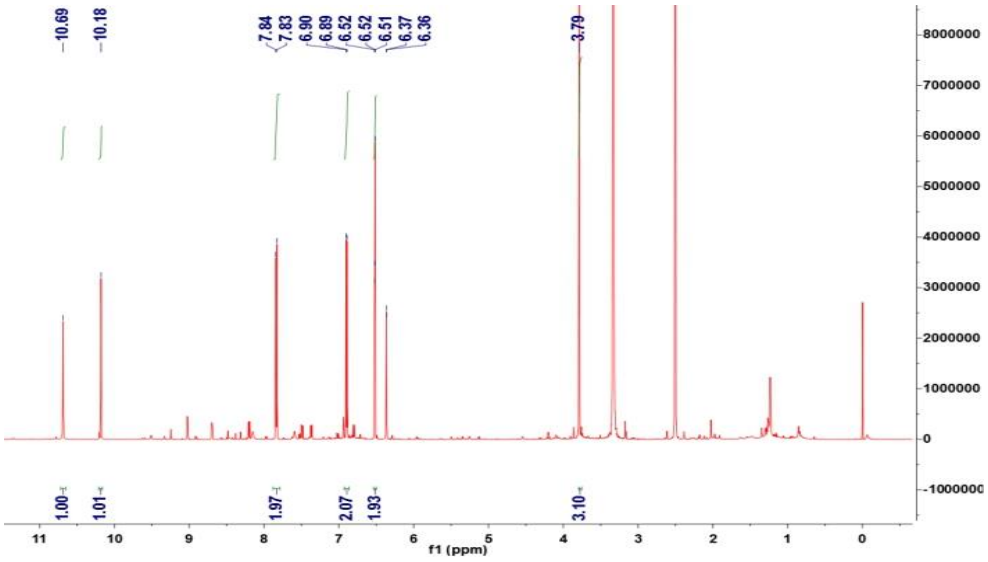
Compound **24:** ^1H-NMR spectra

S25 :*NMR and mass data and spectra of compound* ***25*** *(Thevetiaflavone)*

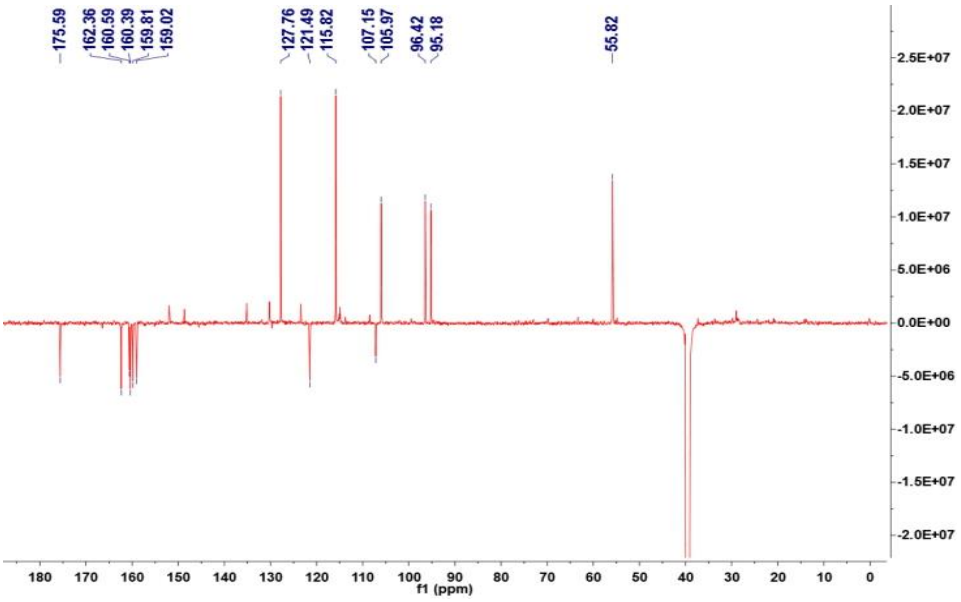
Q/TOF-MS (*m/z*): 283.0576 [M-H]$^-$, (calcd for $C_{16}H_{12}O_5$). ^{1}H NMR (600 MHz, DMSO-d_6) δ: 10.69 (1H, s, 4'-OH), 10.18 (1H, s, 7-OH), 7.83 (2H, d, J = 8.4 Hz, H-2′, 6′), 6.89 (2H, d, J = 8.4 Hz, H-3′, 5′), 6.52 (1H, d, J = 1.8 Hz, H-8), 6.51 (1H, s, H-3), 6.36 (1H, d, J = 1.8 Hz, H-6), 3.79 (3H, s, 5-OCH3). DEPTQSP (150 MHz, DMSO-d_6) δ:175.59 (C-4), 162.36 (C-7), 160.59 (C-4′), 160.39 (C-2), 159.81 (C-5), 159.02 (C-9), 127.76 (C-2′,6′), 121.49 (C-1′), 115.82 (C-3′, 5′), 107.15 (C-3), 105.97 (C-10), 96.42 (C-6), 95.18 (C-8), 55.82 (5-OCH_3).



Compound **25:** Q/TOF-MS spectra



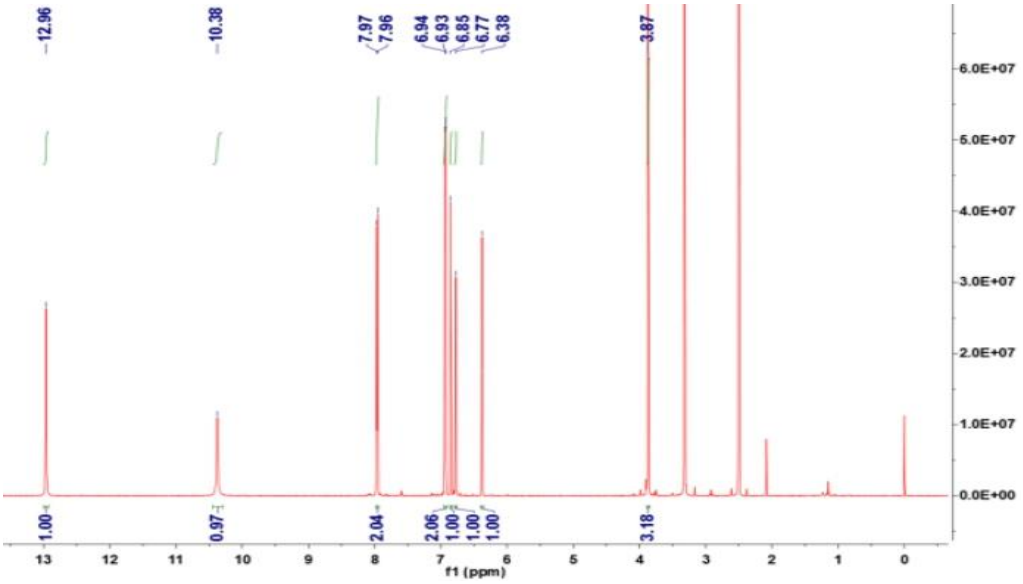
Compound **25:** ^{1}H-NMR spectra



Compound **25:** DEPTQSP spectra

S26 :*NMR and mass data and spectra of compound* ***26*** *(Genkwanin)*

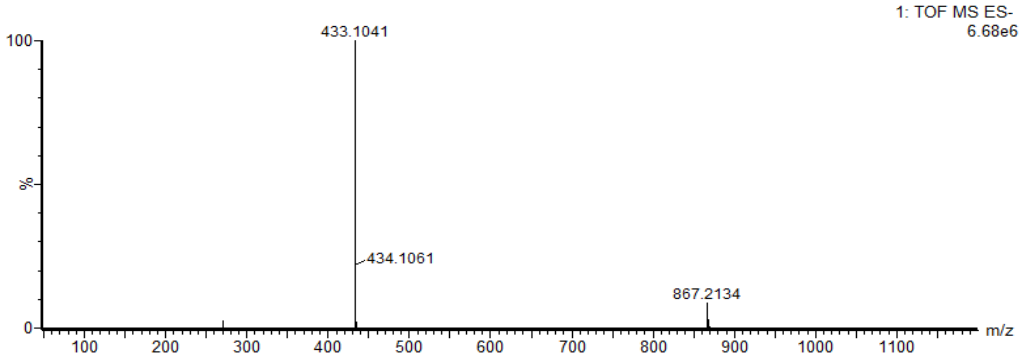
ESI-MS (*m/z*): 305 $[M-H]^-$, (calcd for $C_{16}H_{12}O_5$). ^1H NMR (600 MHz, DMSO-d_6) δ 12.96 (1H, s, 5-OH), 10.38 (1H, s, 4'-OH), 7.96 (2H, d, J = 8.2 Hz, H-2', 6'), 6.93 (2H, d, J = 8.6 Hz, H-3', 5'), 6.85 (1H, s, H-8), 6.77 (1H,s, H-6), 6.38 (1H,s, H-3), 3.87 (3H, s, 7-OCH_3).



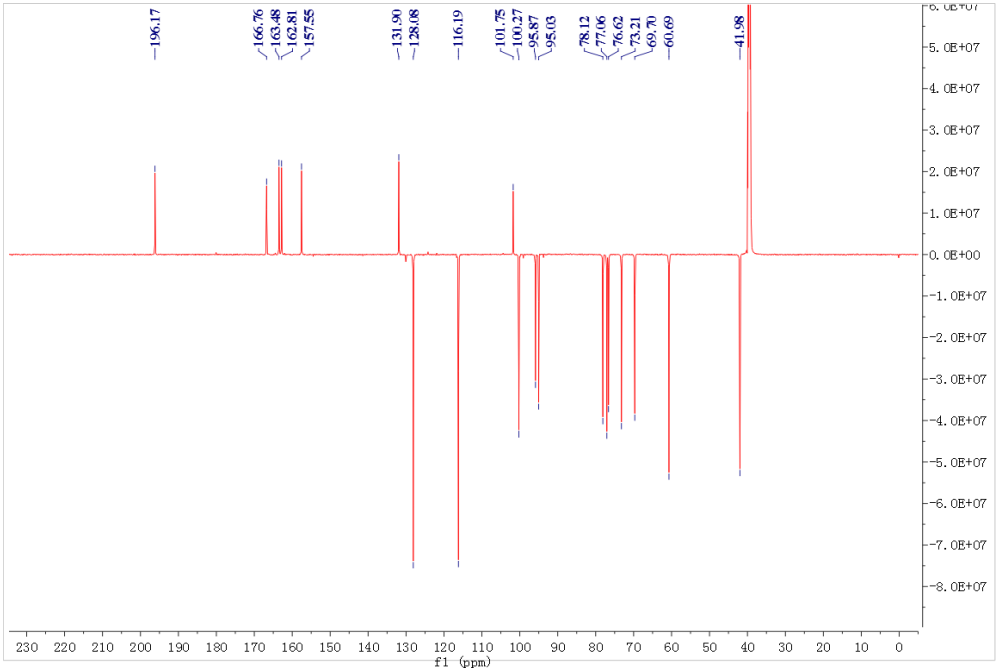
Compound **26:** ^1H-NMR spectra

S27 :*NMR and mass data and spectra of compound* ***27*** *(Choerospondin)*

Q/TOF-MS (*m/z*): 433.1041 [M-H]$^-$, (calcd for $C_{21}H_{22}O_{10}$). DEPTQSP (150 MHz， DMSO-d_6) δ: 78.12 (C-2), 41.98 (C-3), 196.17 (C-4), 163.48 (C-5), 95.87 (C-6), 166.76 (C-7), 95.03 (C-8), 162.81 (C-9), 101.75 (C-10), 131.90 (C-1′), 128.08 (C-2′, 6′), 116.19 (C-3′, 5′), 157.55 (C-4′), 100.27 (C-1″), 73.21 (C-2″), 77.06 (C-3″), 69.70 (C-4″), 76.62 (C-5″), 60.69 (C-6″).



Compound **27:** Q/TOF-MS spectra



Compound **27:** DEPTQSP spectra