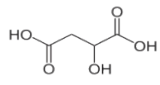
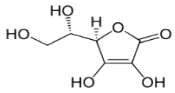
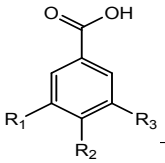
Supplementary Materials



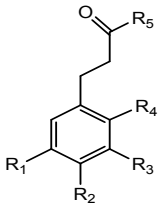
Malic acid (**1**)



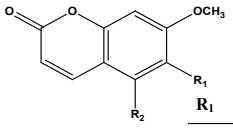
Ascorbic acid (**4**)

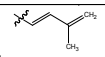


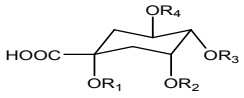
R_1	R_2	R_3	Compound
OH	H	OH	3, 5-Dihydroxybenzoic acid (**3**)
H	OH	H	*p*-Hydroxybenzoic acid (**8**)
OMe	OH	H	Vanillic acid (**5, 9**)
OMe	OH	OMe	Syringic acid (**13**)



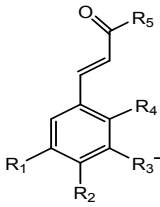
R_1	R_2	R_3	R_4	R_5	Compound
OMe	OH	OMe	H	OH	Dihydrosinapic acid (**6**)
OMe	OH	OMe	H	O-glc	Dihydrosinapoyl-*O*-glucoside (**25**)
OMe	OH	H	H	O-glc-HMG	Dihyrdoferulic acid-HMG-glucoside (**26**)



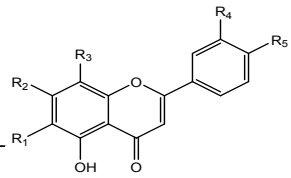
R_1	R_2	Compound
H		5-Geranyloxy- 7-methoxy coumarin (**2**)
		Citrubuntin (**14**)



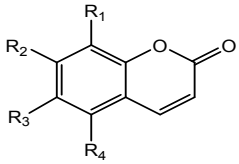
R_1	R_2	R_3	R_4	Compound
H	H	H	F	5-*O*-Feruloylquinic acid (**7**)
H	F	H	H	3-*O*-Feruloylquinic acid (**10**)
H	H	F	H	4-*O*-Feruloylquinic acid (**12**)

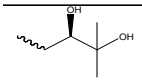


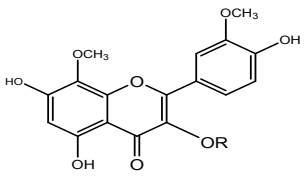
R_1	R_2	R_3	R_4	R_5	Compound
OMe	OH	H	H	OH	Ferulic acid (**19**)
H	H	H	OH	O-Quin.	5-*p*-Coumaroyl quinic acid (**11**)
OH	OMe	H	H	OH	Isoferulic acid (**20**)
H	O-glc	H	H	OH	*p*- Coumaroyl- 6`-glc Ester (**21**)
OMe	OH	OMe	H	OH	Sinapic acid (**22**)
OMe	O-glc	H	H	OH	Feruloyl-6`-glc Ester (**28**)



R	Compound
O-glc-HMG	Limocitrol-*O*-glucoside- HMG (**42**)



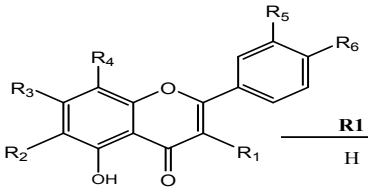
R_1	R_2	R_3	R_4	Compound
	OMe	H	H	Meranzine hydrate (**17**)



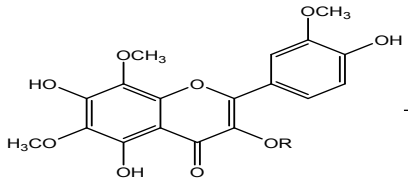
R	Compound
O-glc-HMG	Limocitrin -*O*-glucoside- HMG (**38**)
O-glc-HMG-HMG-Caf.	Limocitrin -*O*-glucoside-HMG-HMG-Caf. (**69**)

Fig. S1A Metabolites identified in Murcott dichloromethane (DCM) and ethyl acetate (ET) fractions using HPLC-PDA-ESI- MS in negative ion mode.

glc= Glucose; Rut. = Rutinosyl; Neoh. = Neohesperidosoyl; Caf. = Caffeoyl; HMG= 3- Hydroxy-3-methyl glutaryl; F= Feruloyl; Quin. = Quinoyl.



R1	R2	R3	R4	R5	R6	Compound
H	(2``-O-Xylosyl) Glc.	OH	H	H	OH	Apigenin-6-C-glucosyl-2``-O-xyloside (**33**)
H	H	OH	(2``-O-Xylosyl) glc	H	OH	Apigenin-8-C-glucosyl-2``-O-xyloside (**35**)
H	H	OH	H	OH	OMe	Diosmetin (**75**)
H	H	O-Rut.	H	OH	OMe	Diosmin (**53**)
O-Rut.	H	OH	H	OH	OH	Rutin (**62**)
OMe	H	OMe	H	H	OMe	5-Hydroxy- 3,4', 7-trimethoxy flavone (**70**)
O-HMG-glc	H	OH	OMe	OH	OH	8-Methoxyquercetin-3-*O*-[6``-HMG]-glucoside (**27**)
O- glc	H	OH	OMe	OH	OH	8-Methoxyquercetin-3-*O*-glucoside (**56**)
O- Rut.	H	O-glc	H	OH	OH	Quercetin-3-*O*-rutinosyl-7-*O*- glucoside (**68**)
O-Rut.	H	OH	H	OMe	OH	Isorhamnetin-3-*O*-rutinoside (**64**)
OMe	H	OH	H	OMe	OH	Quercetin dimethyl ether (**74**)
OMe	OMe	OH	H	OMe	OH	Jaceidin (**73**)



R1	R2	R3	R4	R5	Compound
glc	OH	glc	OMe	OH	Stellarin-2 (**30**)
glc	OH	glc	OH	OMe	Lucenin-2 4`-methyl ether (**31**)
glc	OH	glc	H	OH	Vicenin-2 (**32**)
glc	OH	H	OH	OH	Isoorientin (**34**)
H	OH	glc	OH	OH	Orientin (**36**)
H	OH	glc	OMe	OH	Scoparin (**37**)
H	OH	glc	H	OH	Vitexin (**43**)
glc	OH	H	H	OH	Isovitexin (**44**)
H	OH	glc	OH	OMe	Orientin-4`-methyl ether (**45**)
glc	OH	H	OMe	OH	Isoscoparin (**49**)
H	O-Rut.	H	OH	OH	Luteolin-7-O-rutnoside (**50**)
H	O-glc	H	OMe	OH	Chrysoeriol-7-O-glucoside (**63**)
glc	OH	H	OH	OMe	Isoorientin-4`-methyl ether (**65**)
H	OH	H	OMe	OH	Chrysoeriol (**72**)
H	O-Neoh.	H	OH	OH	Luteolin-7-O-neohesperidoside
H	OH	H	OH	OH	Luteolin (**89**)

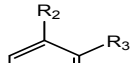
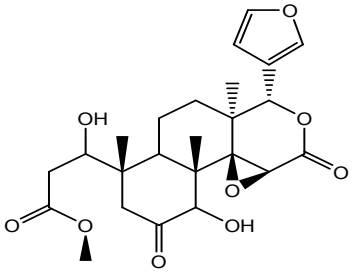
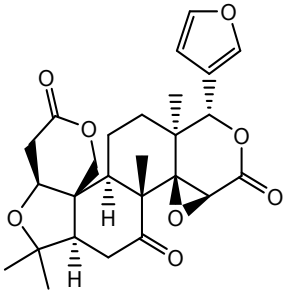


Fig. S1B Metabolites identified in Murcott dichloromethane (DCM) and ethyl acetate (ET) fractions using HPLC-PDA-ESI- MS in negative ion mode.

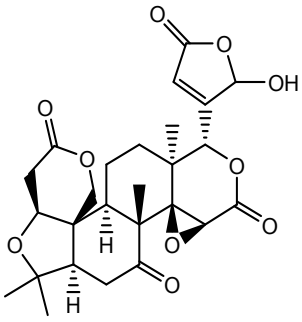
glc= Glucose; Rut. = Rutinosyl; Neoh. = Neohesperidosoyl; Caf. = Caffeoyl; HMG= 3- Hydroxy-3-methyl glutaryl; F= Feruloyl; Quin. = Quinoyl.



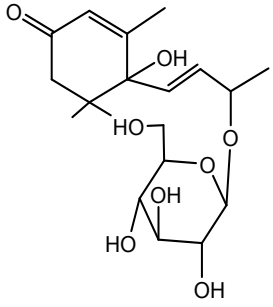
Retrocalamin (**23**)



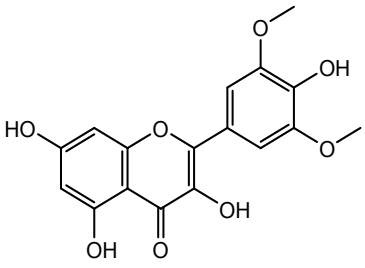
Limonin (**92**)



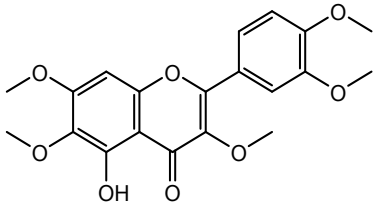
Limonexic acid (**58,59**)



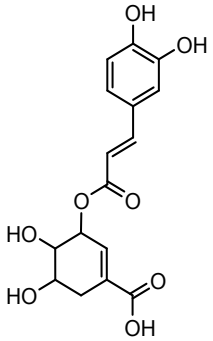
Drovomifoliol-*O*-glucopyranoside (**29**)



Syringetin (**18**)



Artemetin (**79**)



3-*O*-Caffeoyl shikimic acid (**15**)

Fig. S1C Metabolites identified in Murcott dichloromethane (DCM) and ethyl acetate (ET) fractions using HPLC-PDA-ESI- MS in negative ion mode.

glc= Glucose; Rut. = Rutinosyl; Neoh. = Neohesperidosoyl; Caf. = Caffeoyl; HMG= 3- Hydroxy-3-methyl glutaryl; F= Feruloyl; Quin. = Quinoyl.

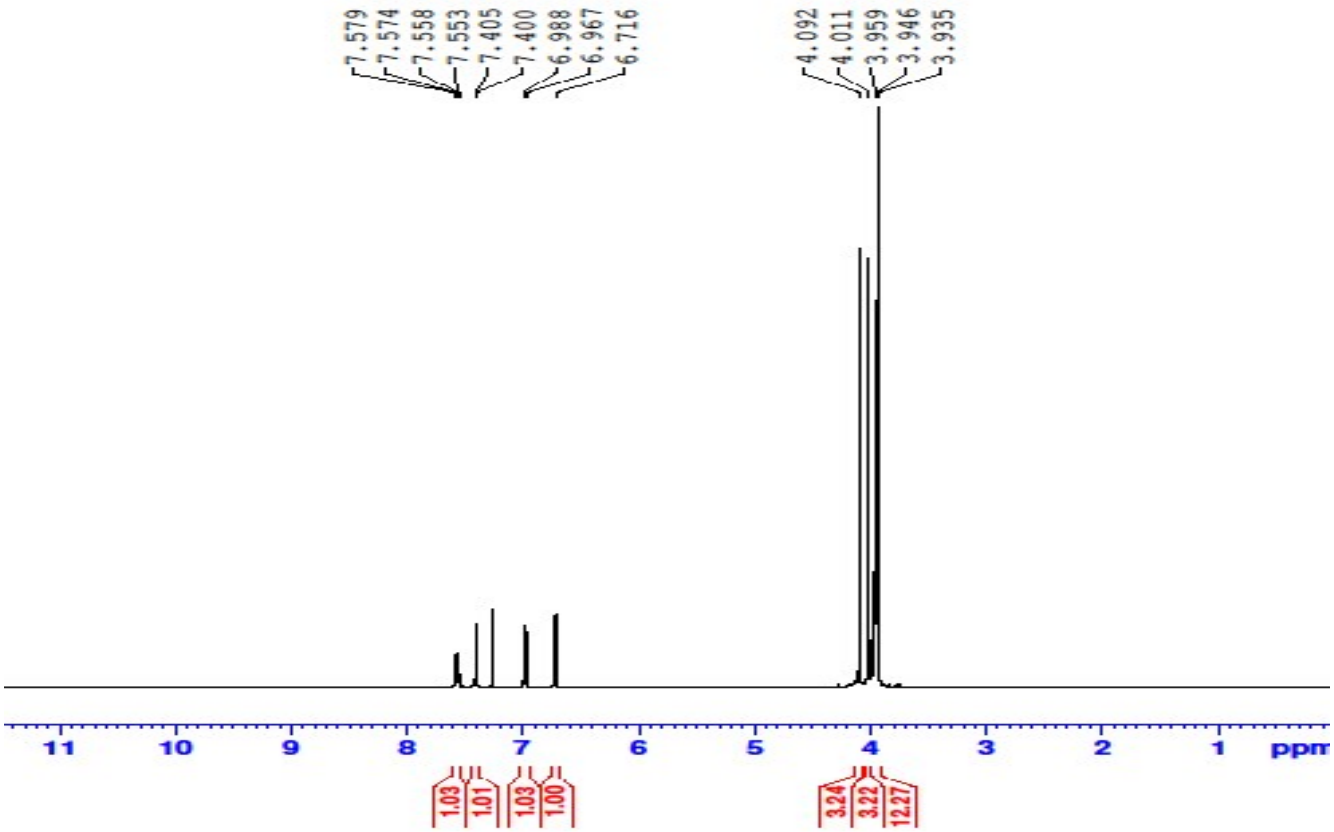


Fig. S2 ^{1}H-NMR spectrum of compound **C1** (Nobiletin)

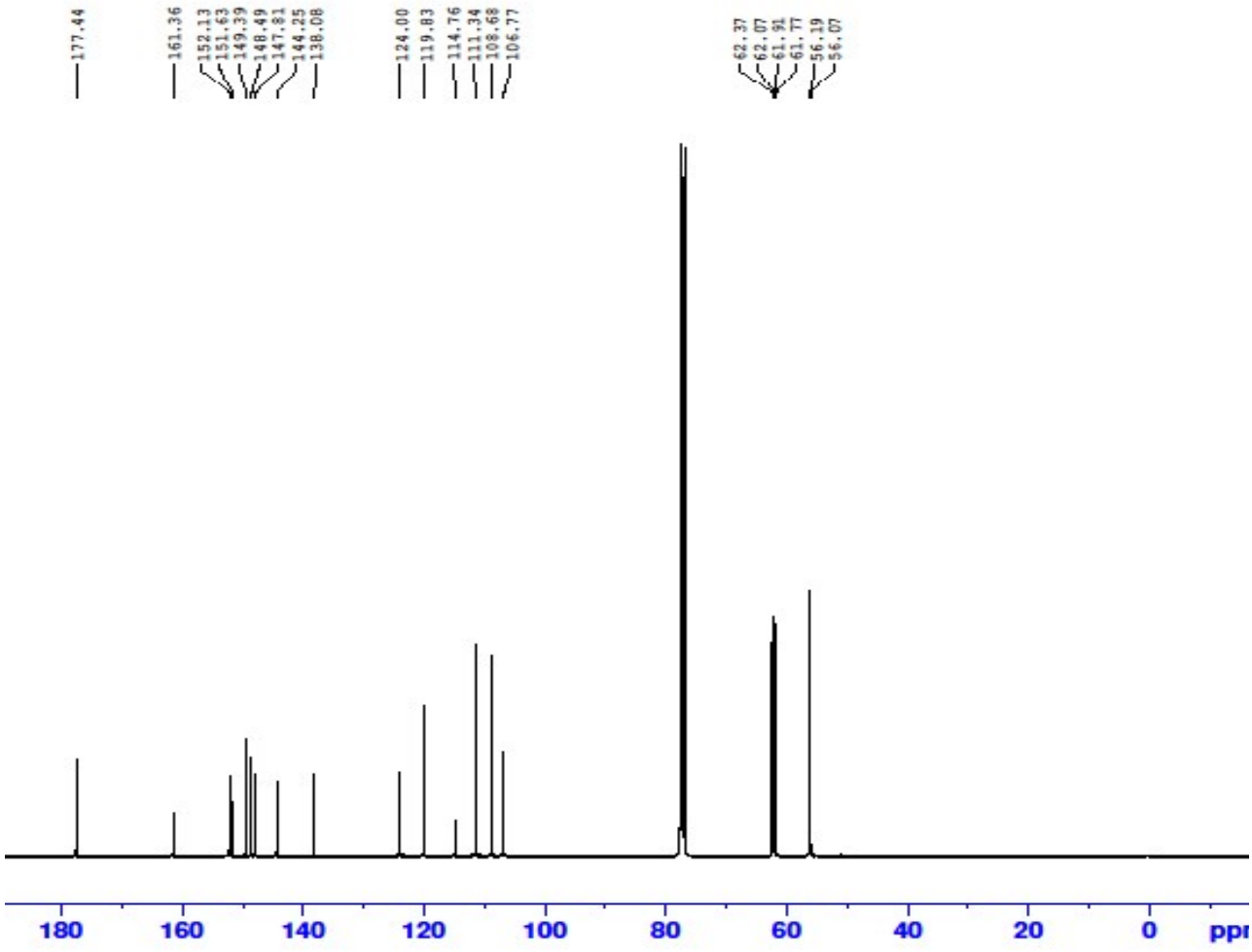


Fig. S3 ^{13}C-NMRspectrum of compound **C1** (Nobiletin)

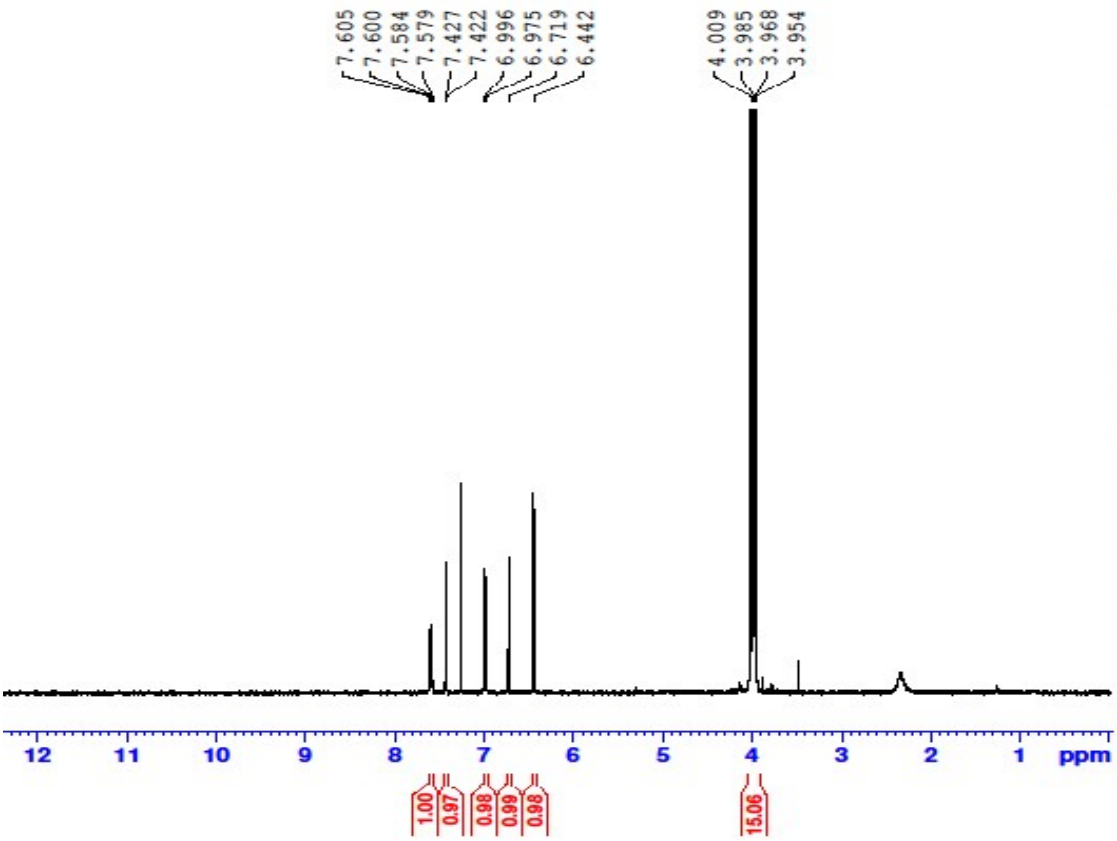


Fig. S4 ^{1}H-NMR spectrum of compound **C2** (Isosinensetin)

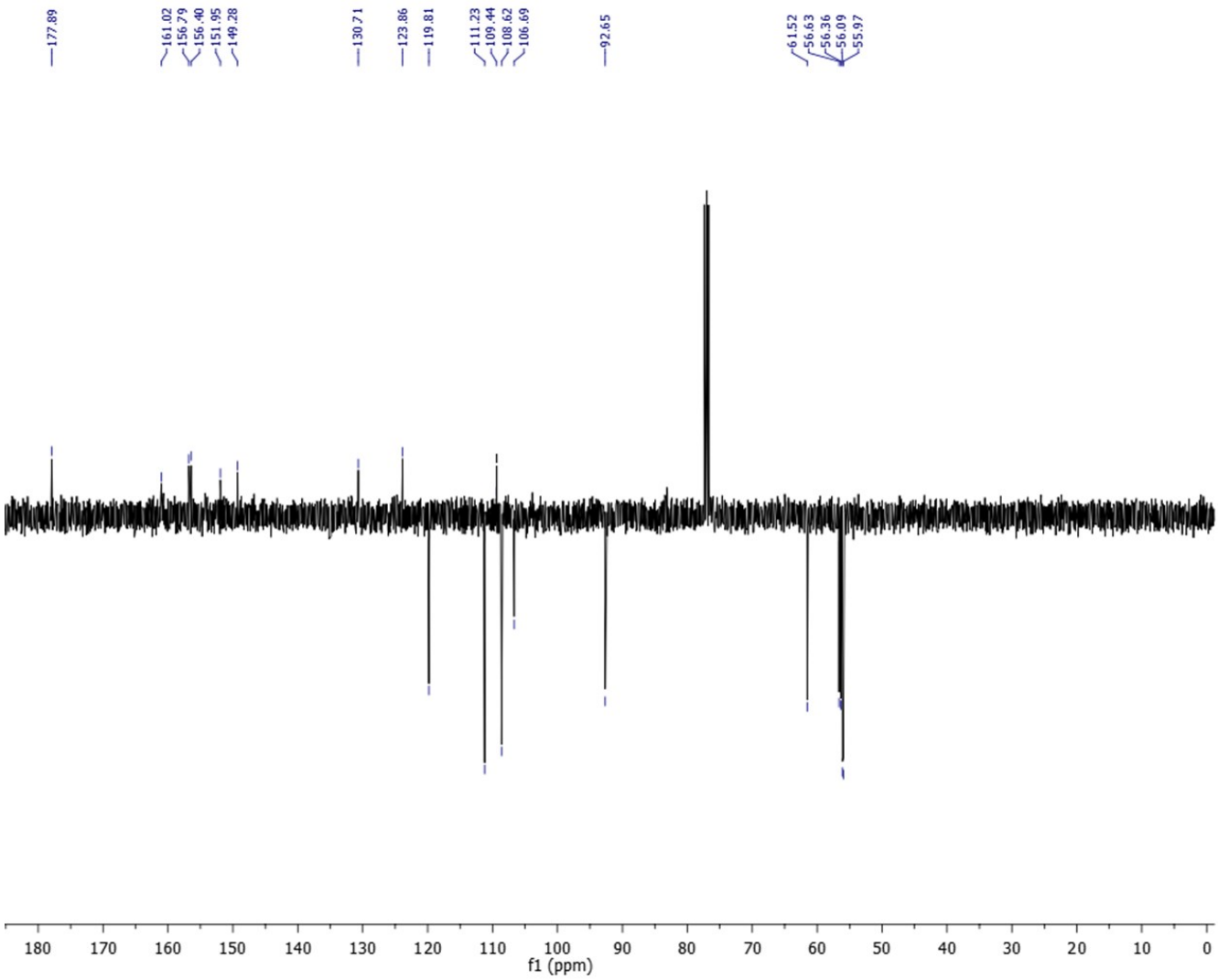


Fig. S5 ^{13}C-NMRspectrum of compound **C2** (Isosinensetin)

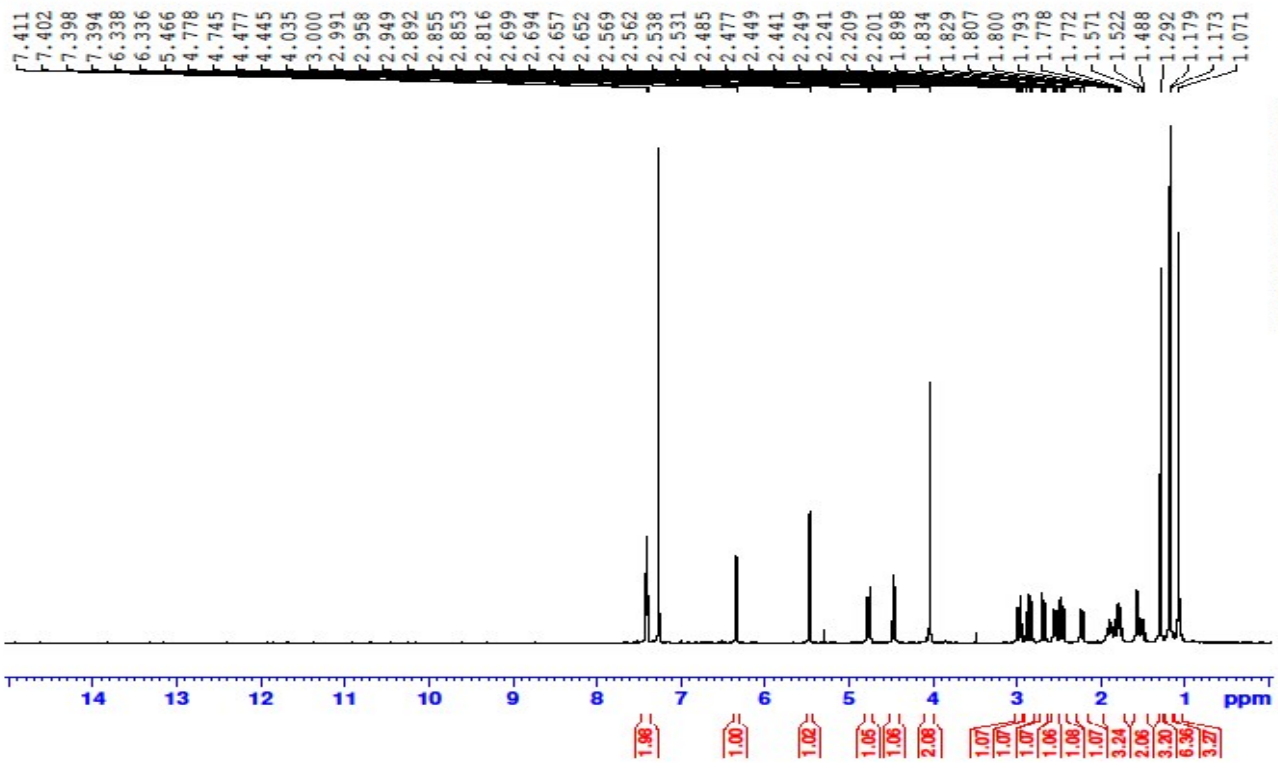


Fig. S6 ^{1}H-NMR spectrum of compound **C3** (Limonin)

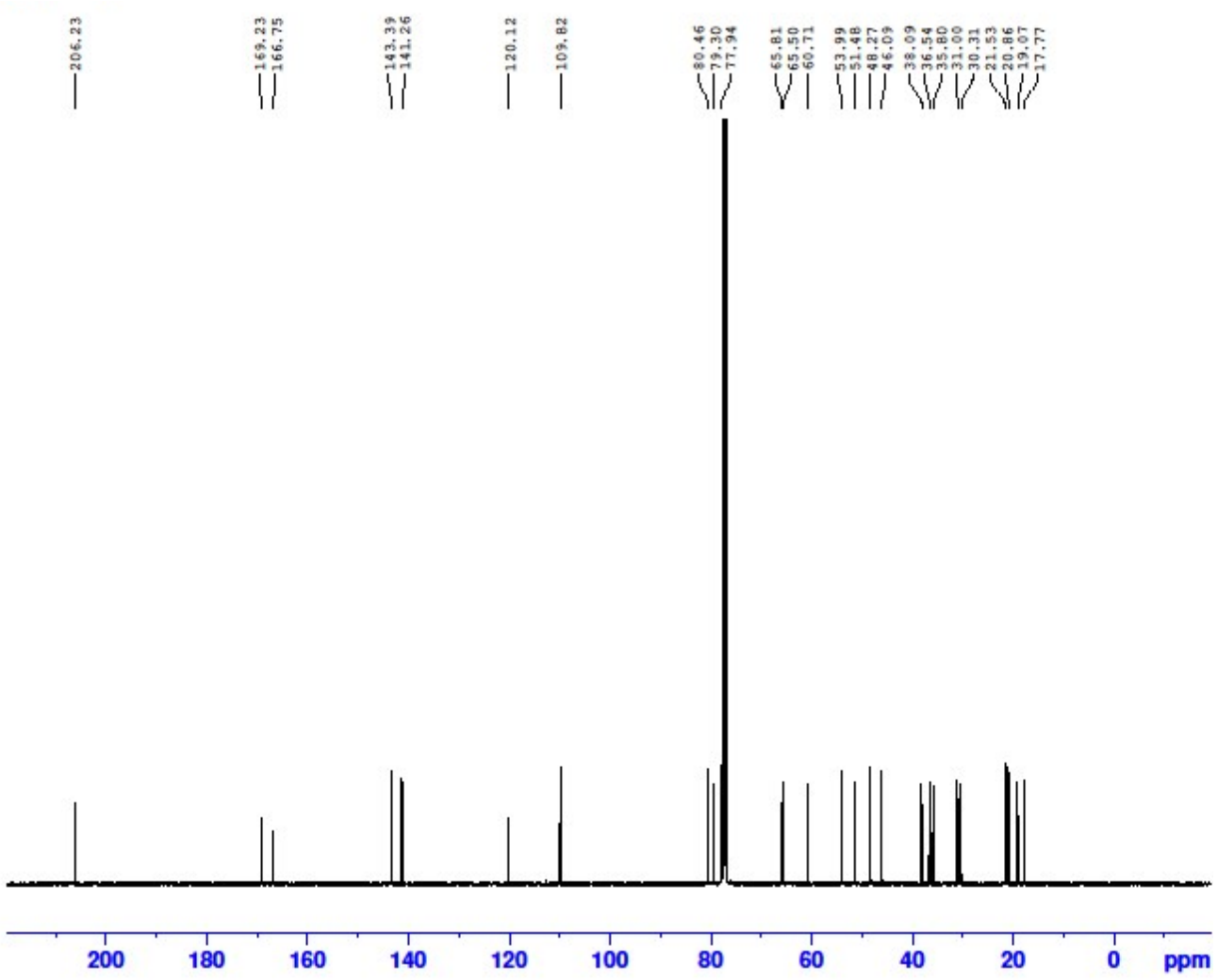


Fig. S7 ^{13}C-NMRspectrum of compound **C3** (Limonin)

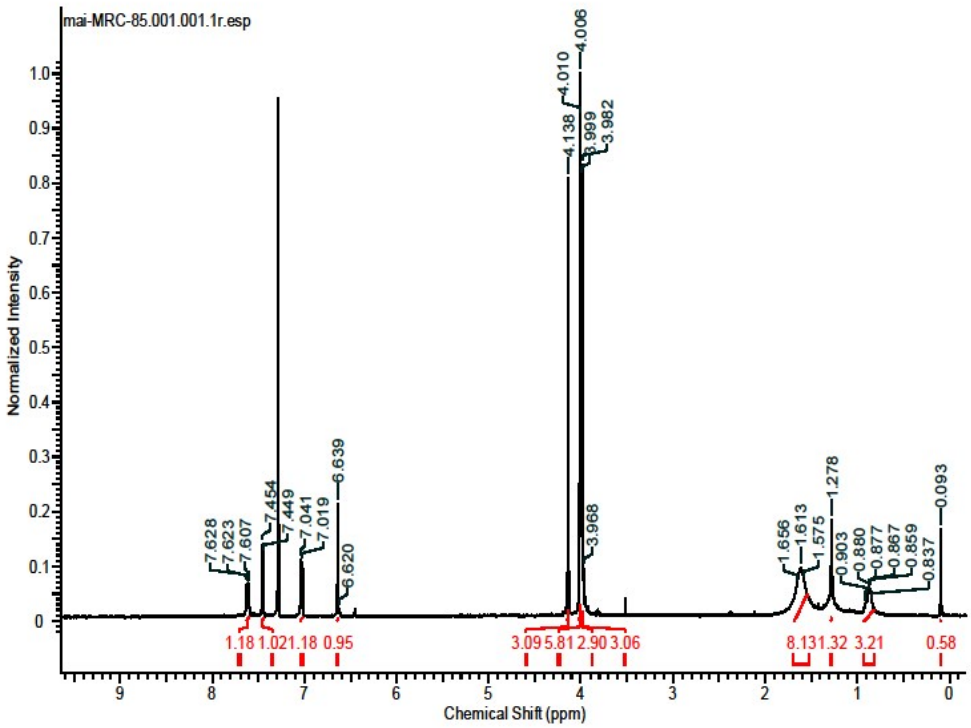


Fig. S8 [1]H-NMR spectrum of compound **C4** (4□-Demethylnobiletin)

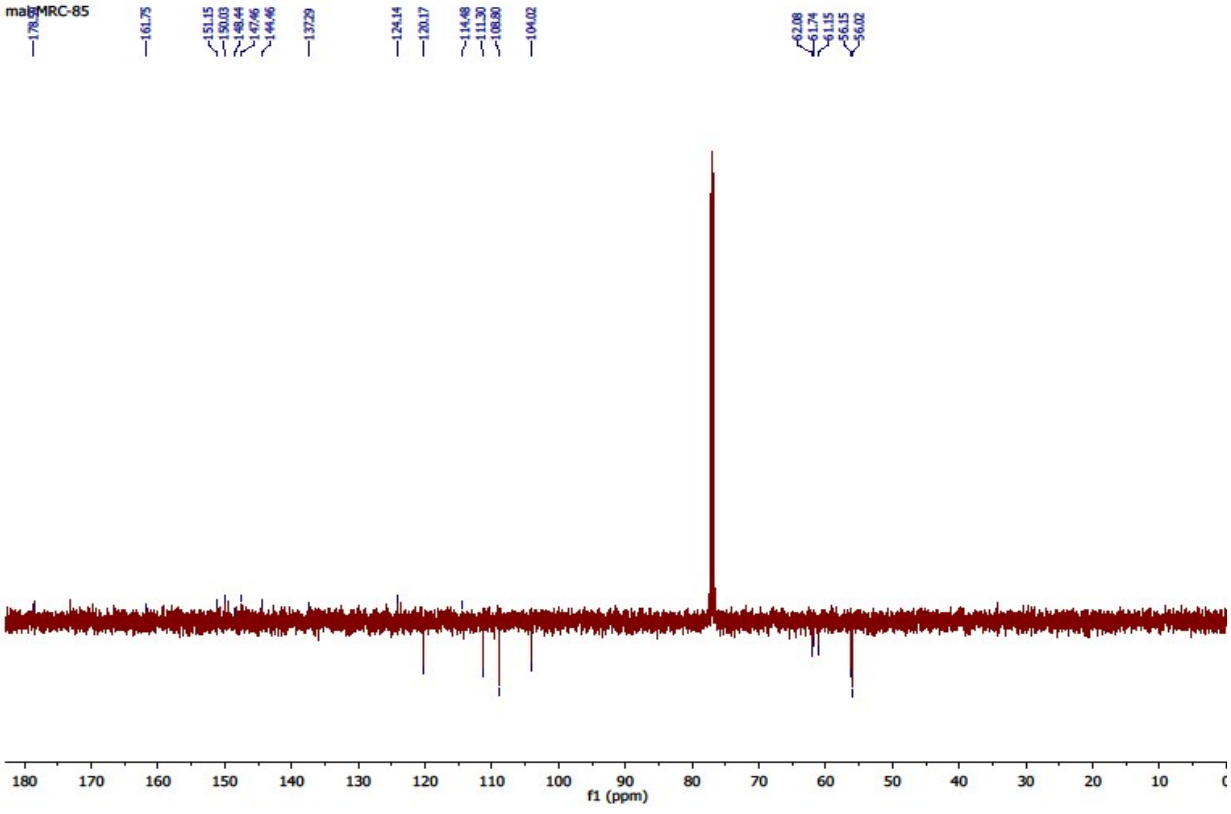


Fig. S9 ^{13}C-NMRspectrum of compound **C4** (4□-Demethylnobiletin)

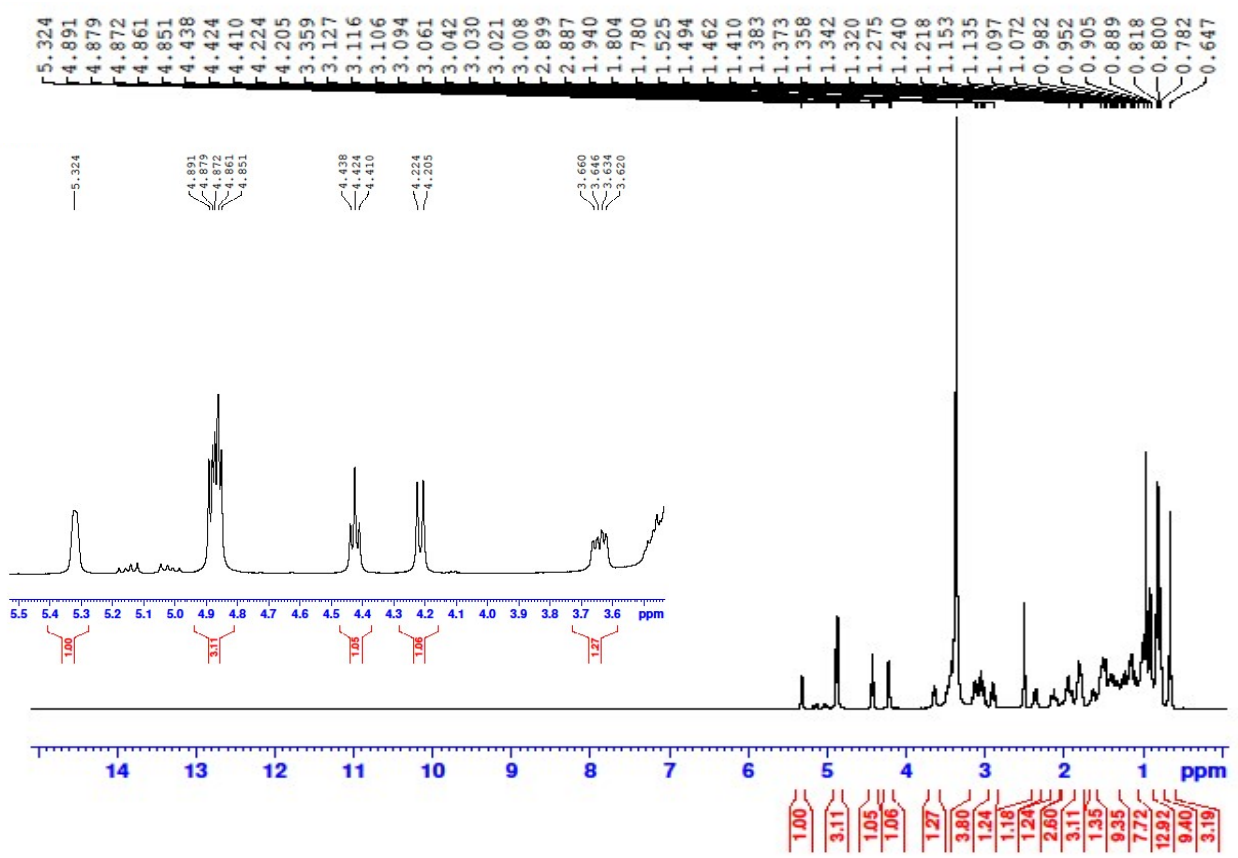


Fig. S10 ^{1}H-NMR spectrum of compound **C5** (Stigmasterol-O-*β*-D-glucoside)

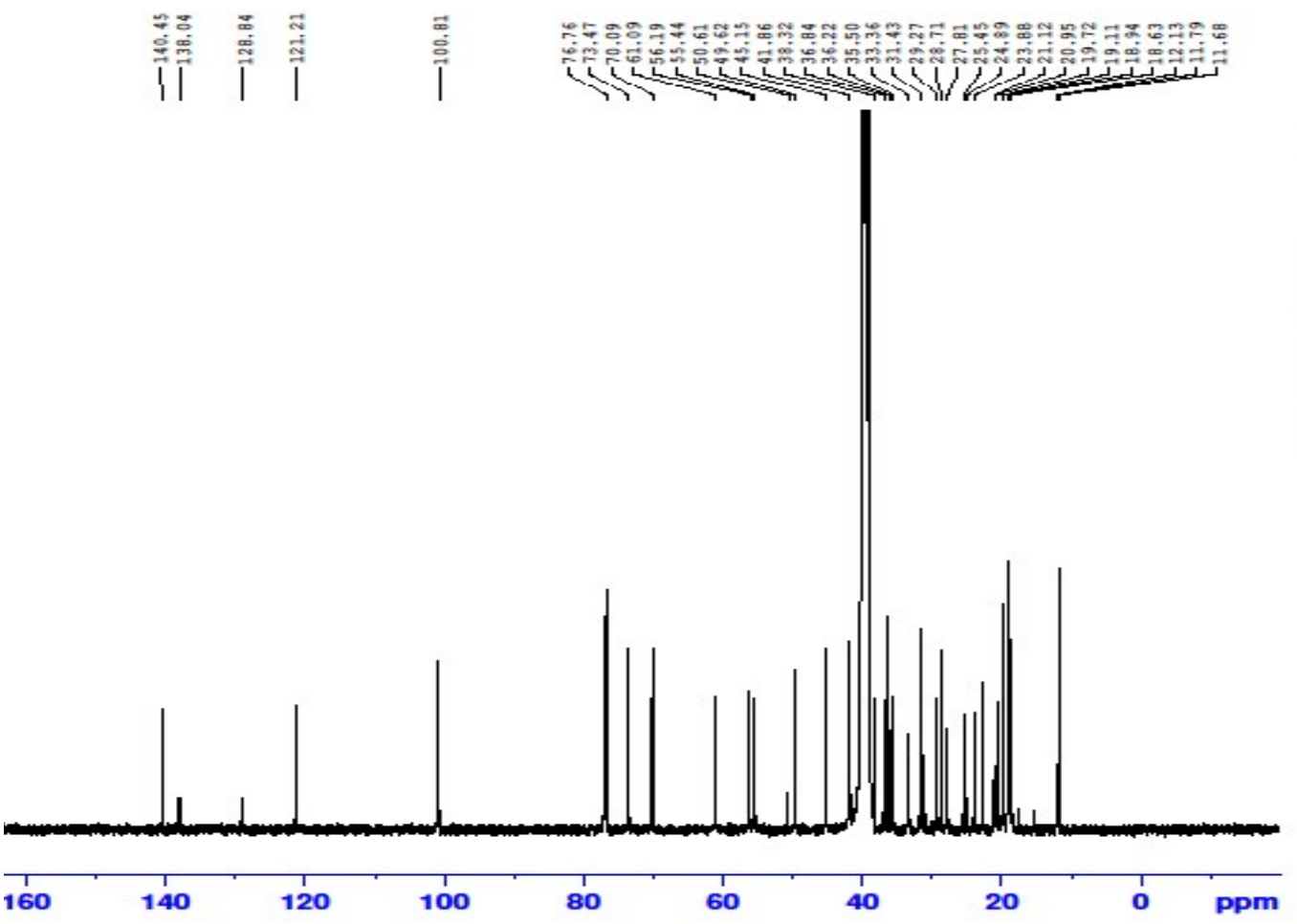


Fig. S11 ^{13}C-NMR spectrum of compound **C5** (Stigmasterol-O-*β*-D-glucoside)

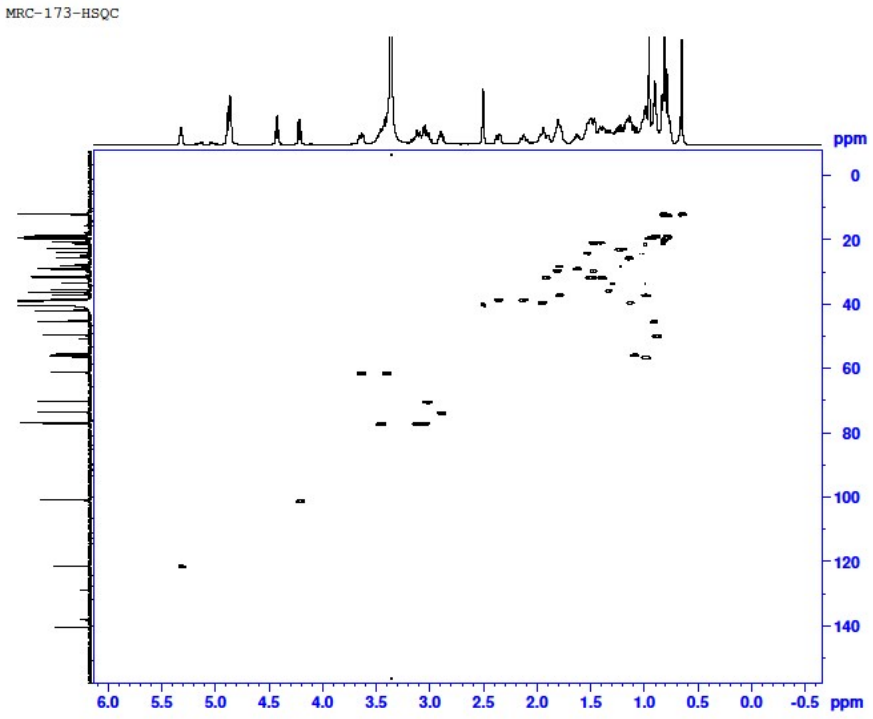


Fig. S12 HSQC spectrum of compound **C5** (Stigmasterol-O-*β*-D-glucoside)

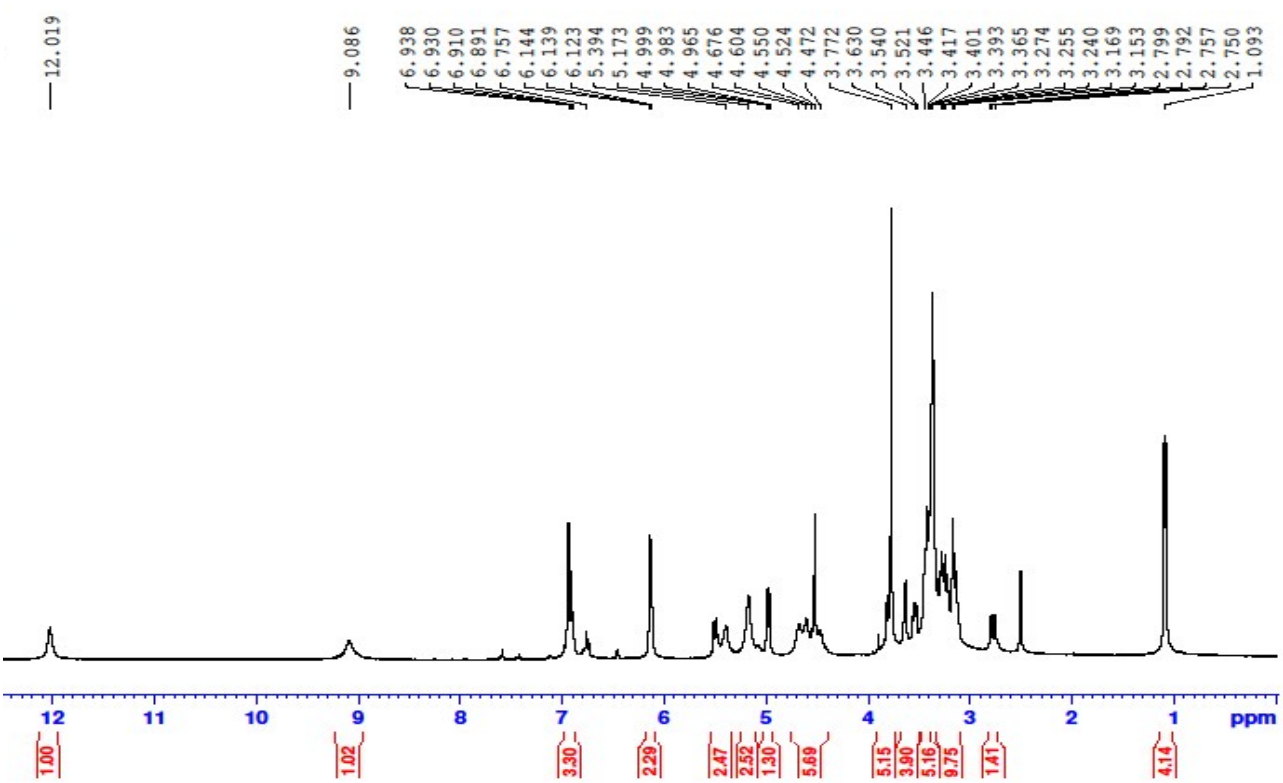


Fig. S13 ^{1}H-NMR spectrum of compound **C6** (Hesperidin)

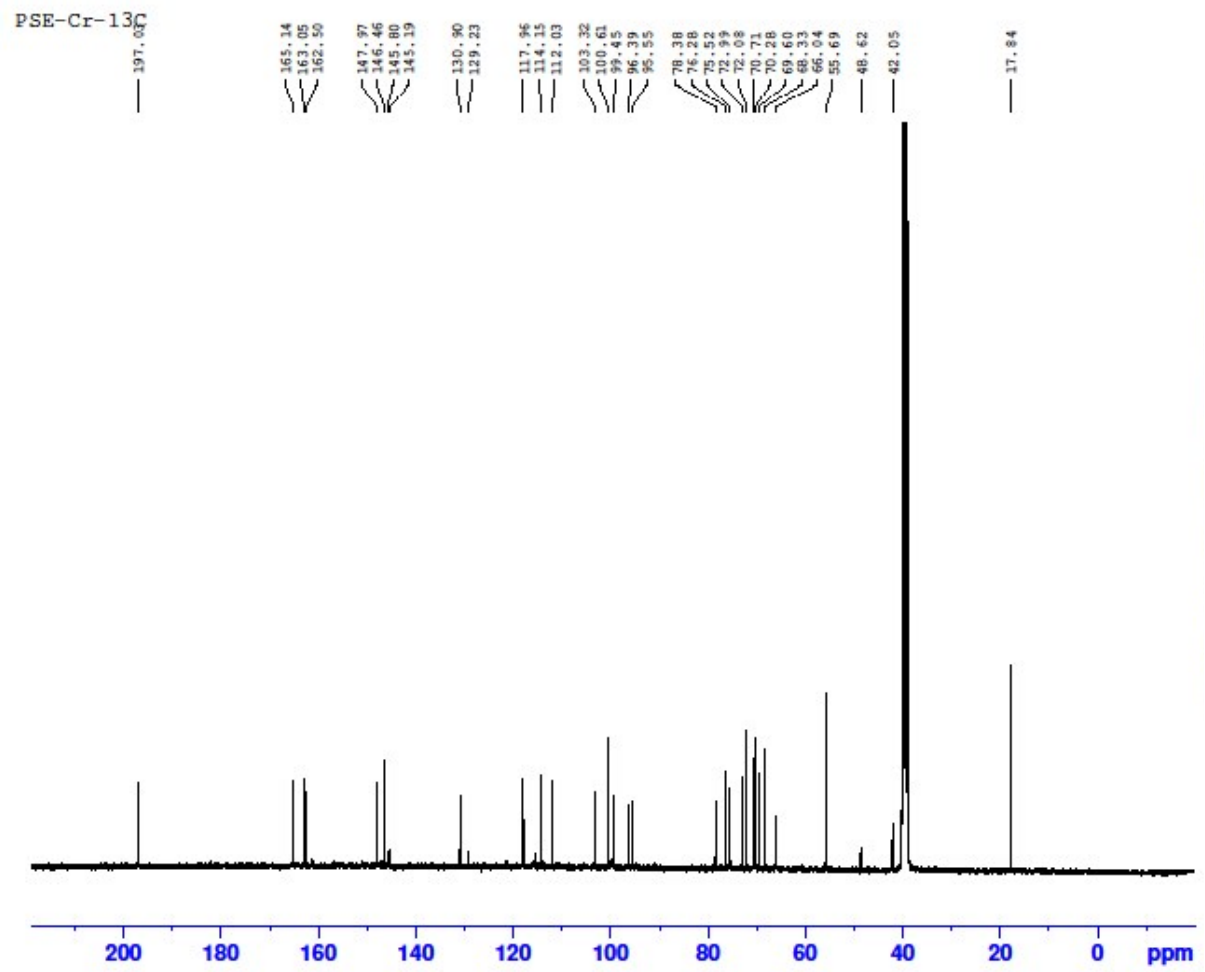


Fig. S14 ^{13}C-NMRspectrum of compound **C6** (Hesperidin)

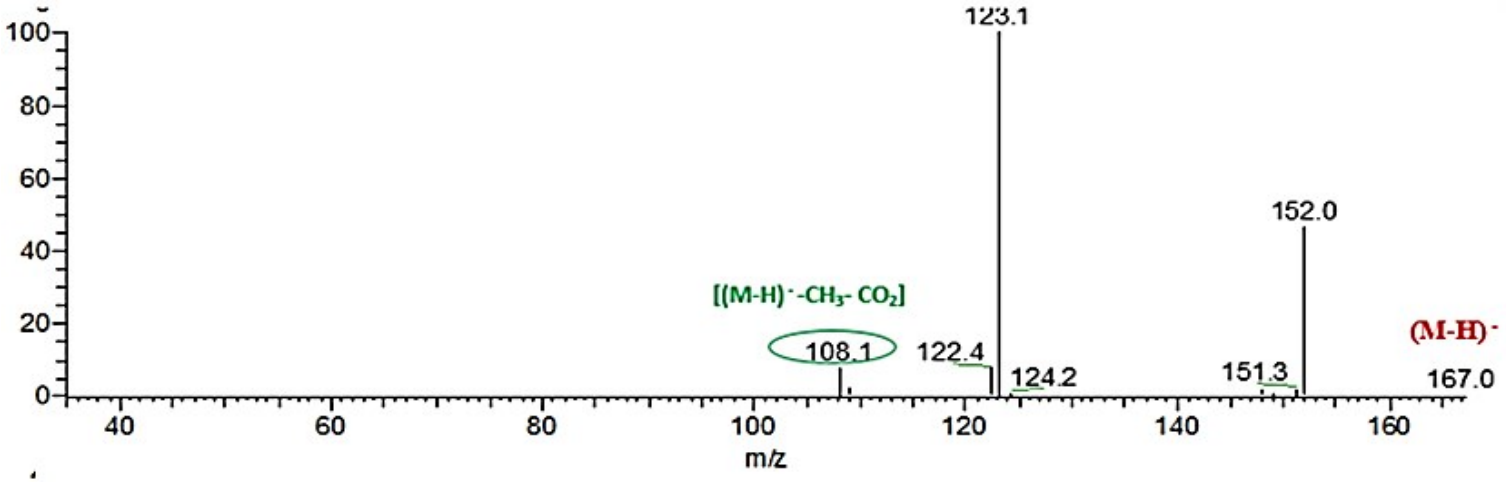


Fig. S15 MS-MS spectrum of vanillic acid (**5**)

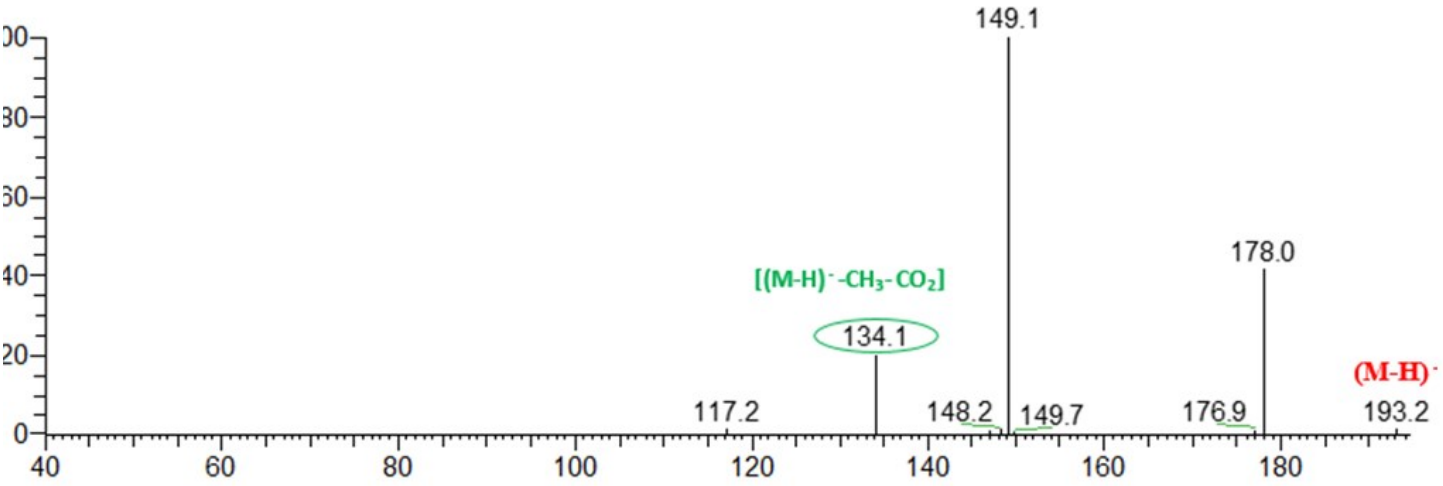


Fig. S16 MS-MS spectrum of ferulic acid (**19**)

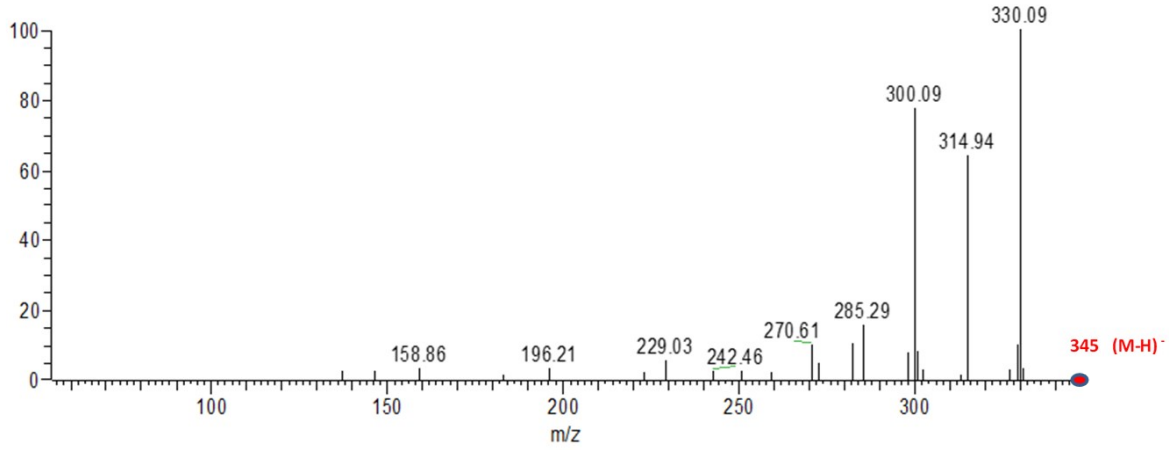


Fig. S17 MS- MS spectrum of syringetin (**18**)

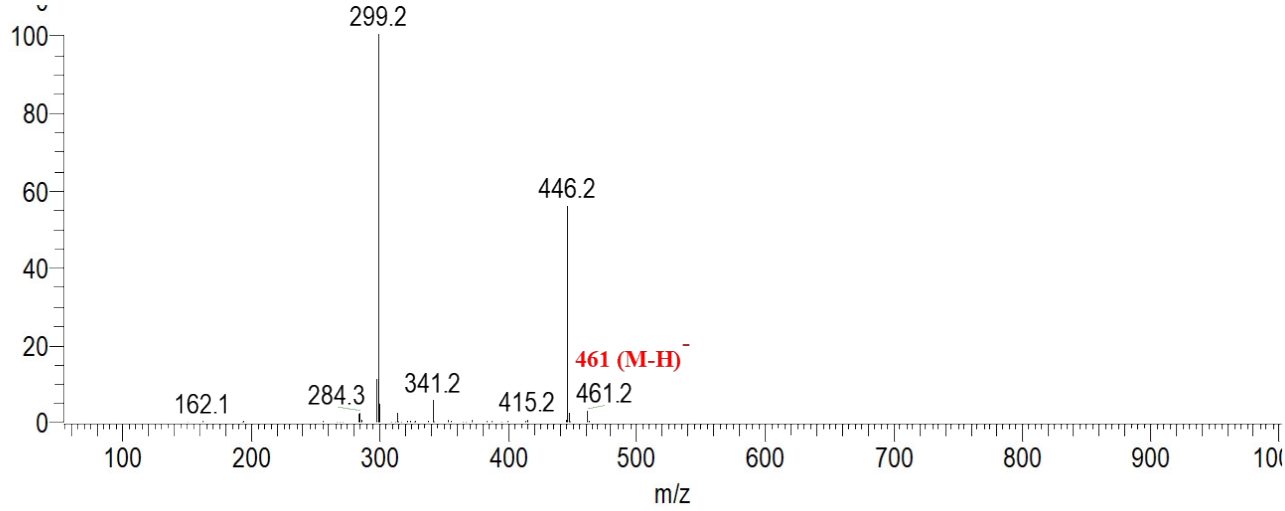


Fig. S18 MS-MS spectrum of chryseriol-7-O-glucoside (**63**)

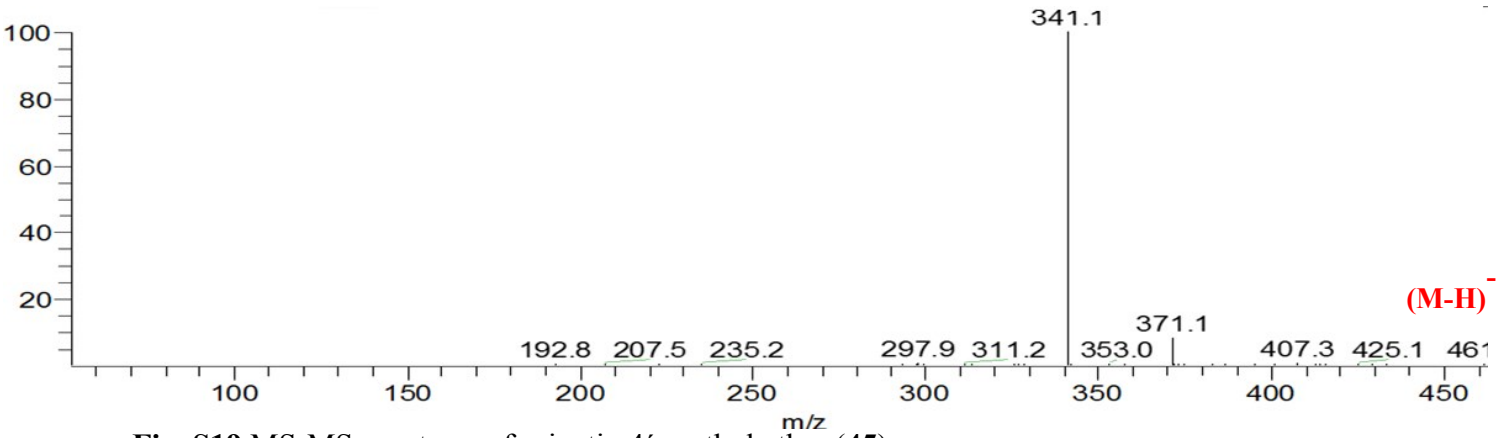


Fig. S19 MS-MS spectrum of orientin 4′-methyl ether (**45**)

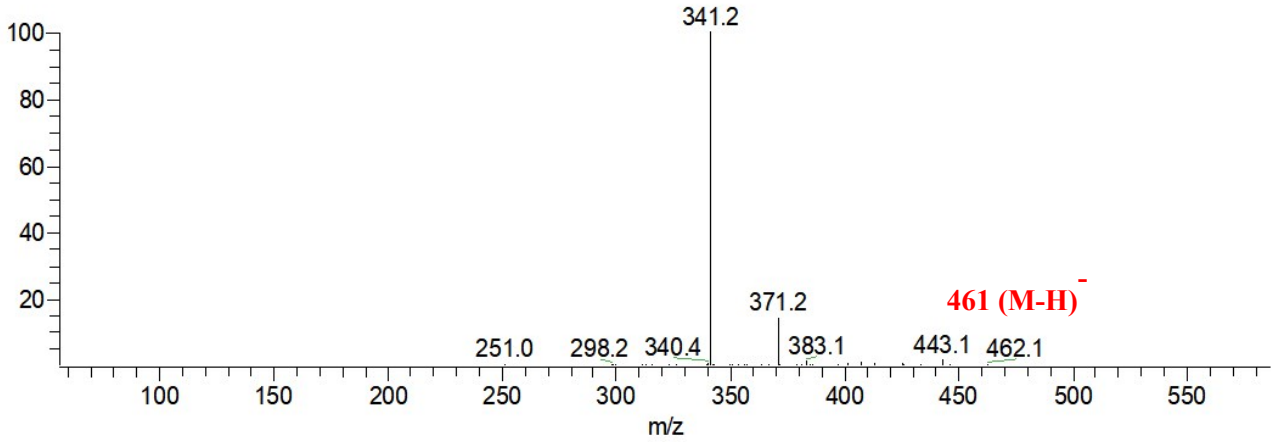
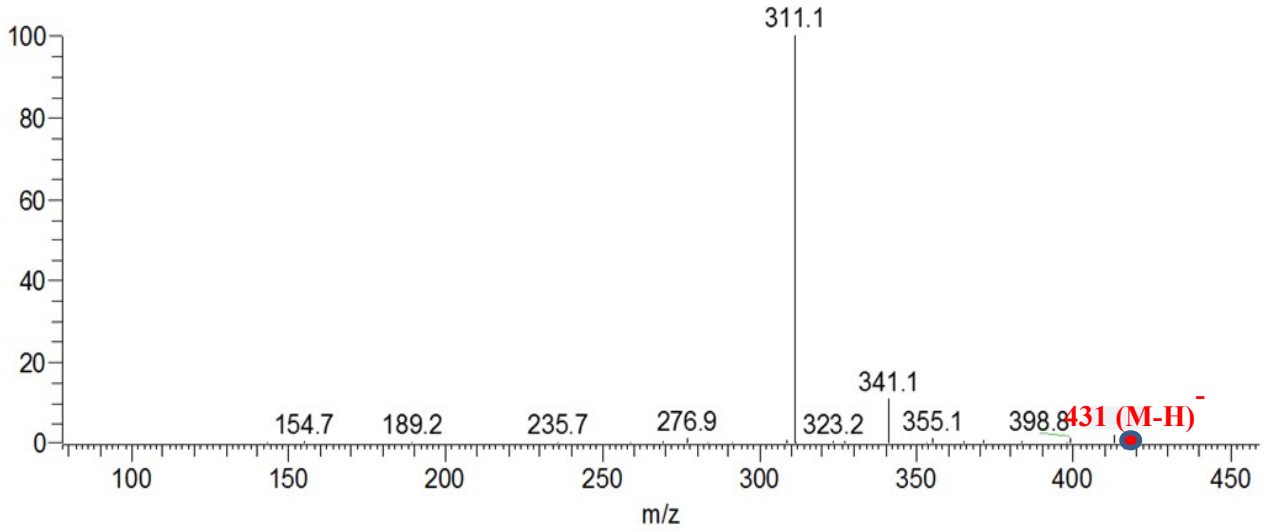


Fig. S20 MS-MS spectrum of scoparin (**37**)


311.1
100
80
60
40
20
0
341.1
154.7
189.2
235.7
276.9
323.2
355.1
398.8
431 (M-H)-
100
150
200
250
300
350
400
450
m/z

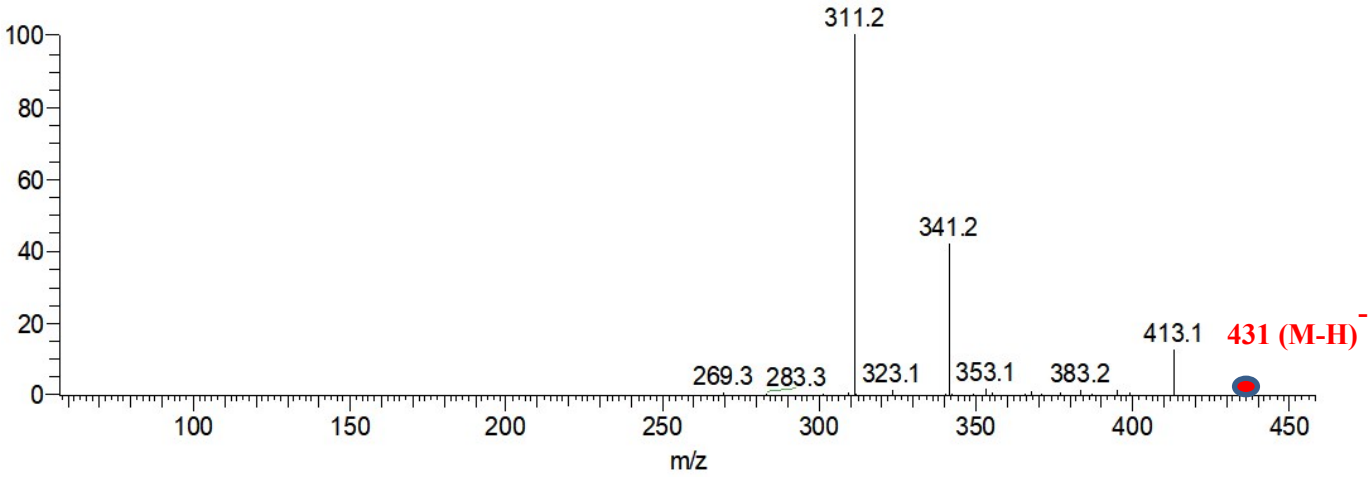


Fig. S22 MS-MS spectrum of isovitexin (**44**)

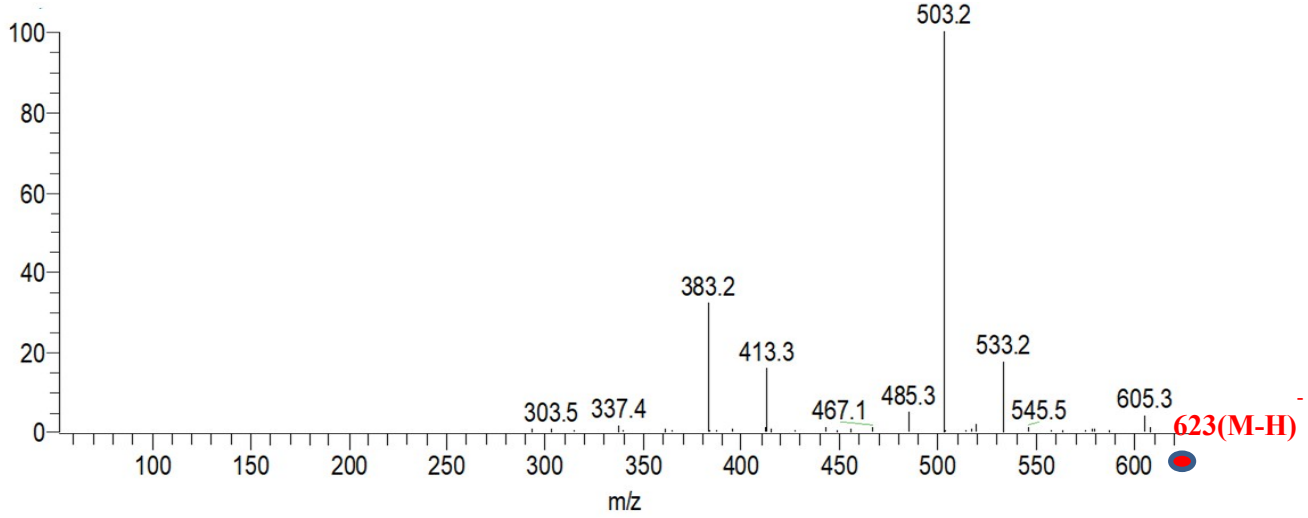


Fig. 23 MS-MS spectrum of lucenin-2 4´-methyl ether (**31**)

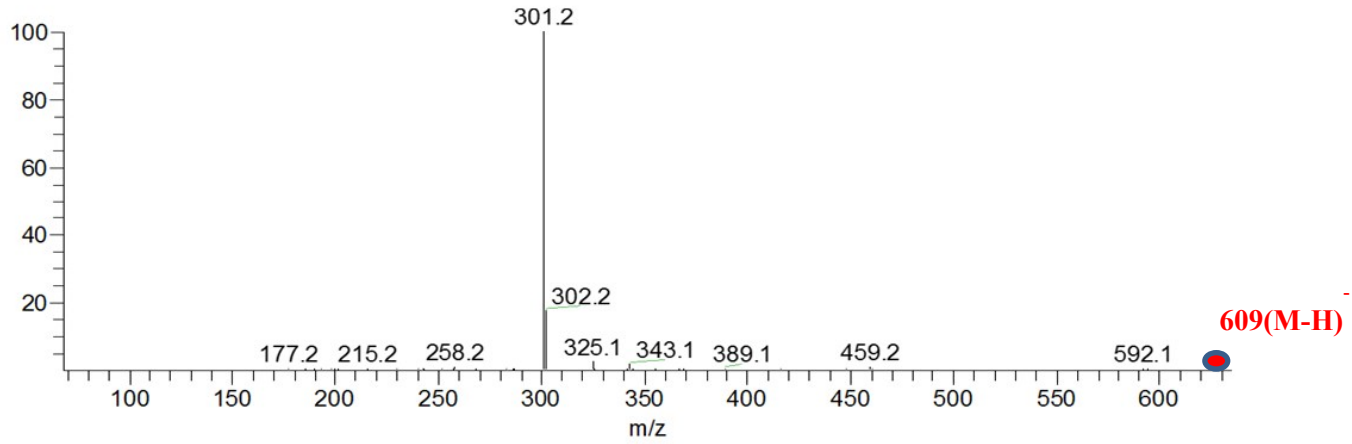


Fig. S24 MS-MS spectrum of hesperidin (**54**)

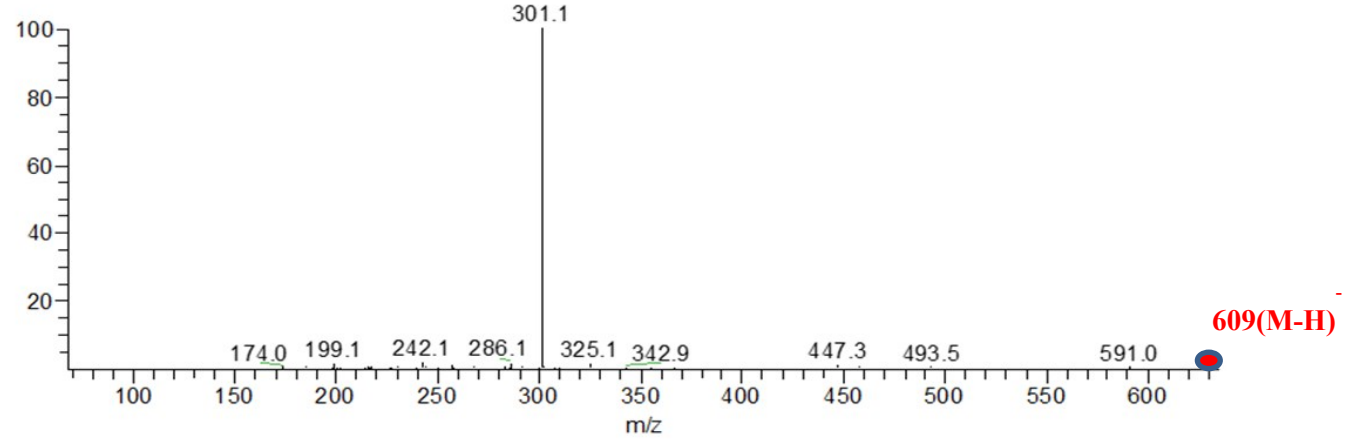


Fig. S25 MS-MS spectrum of neohesperidin (**61**)

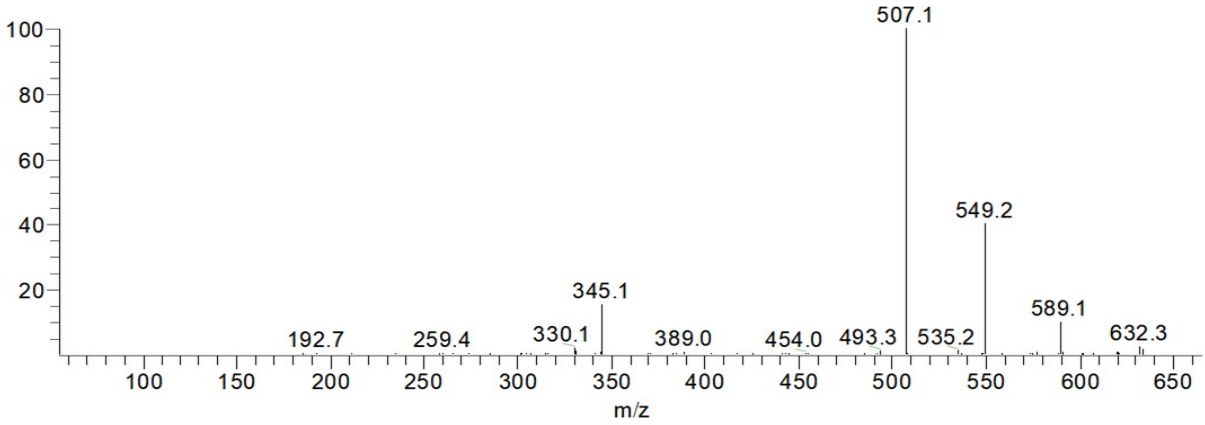


Fig. S26 MS-MS spectrum of limocitrin-O-Glc. HMG (**38**)

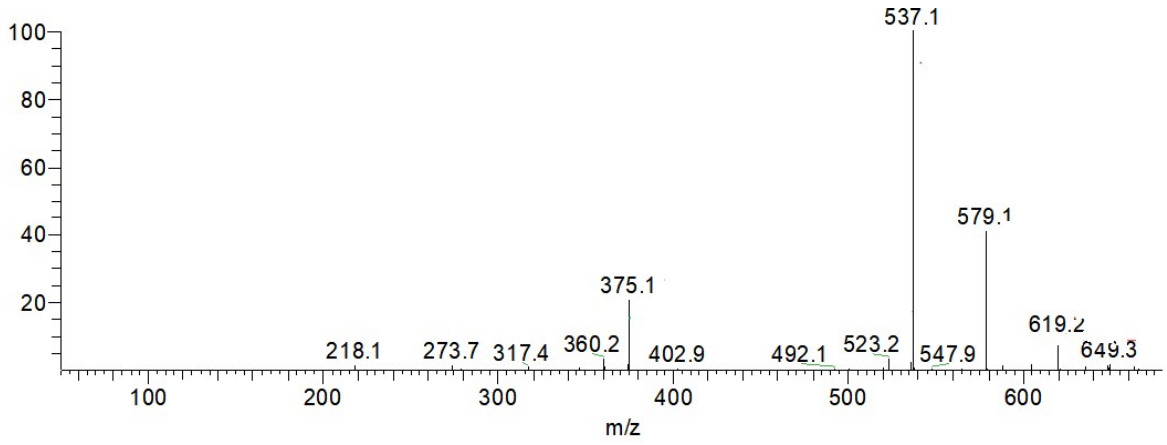
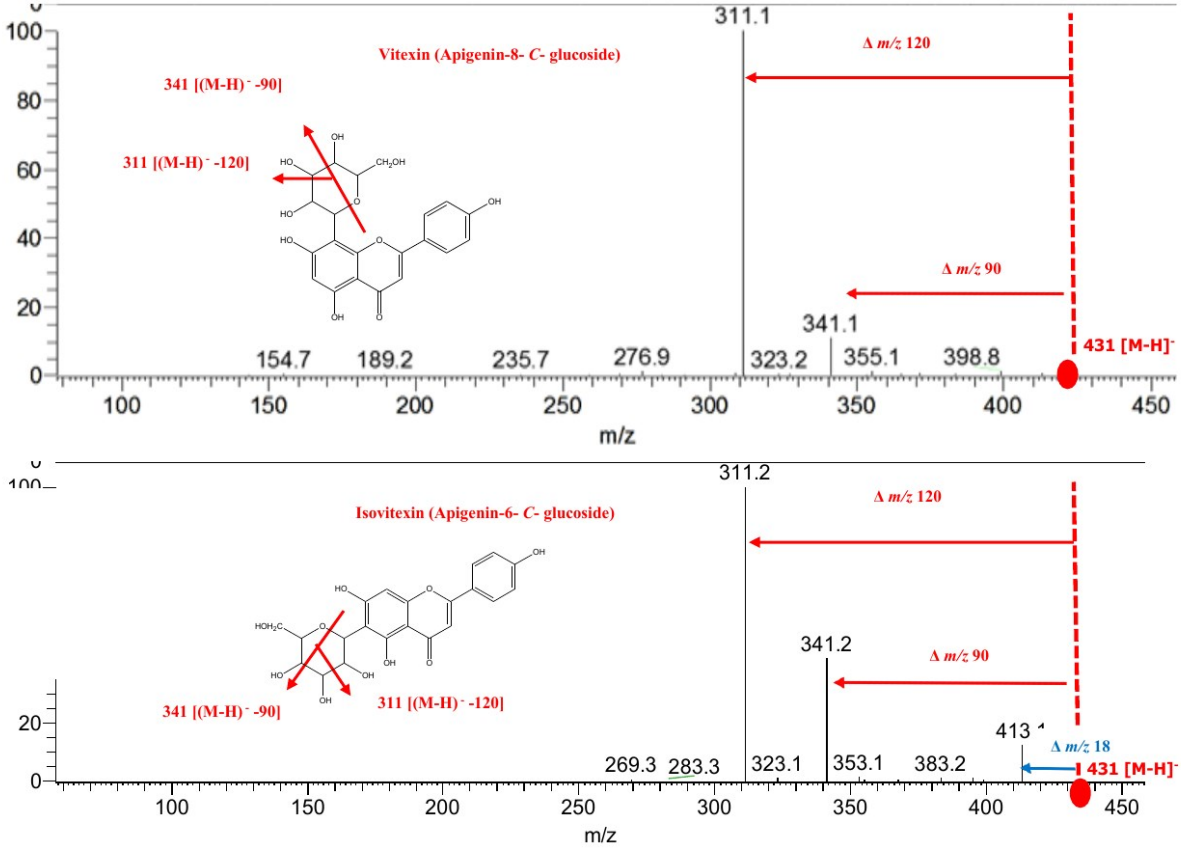
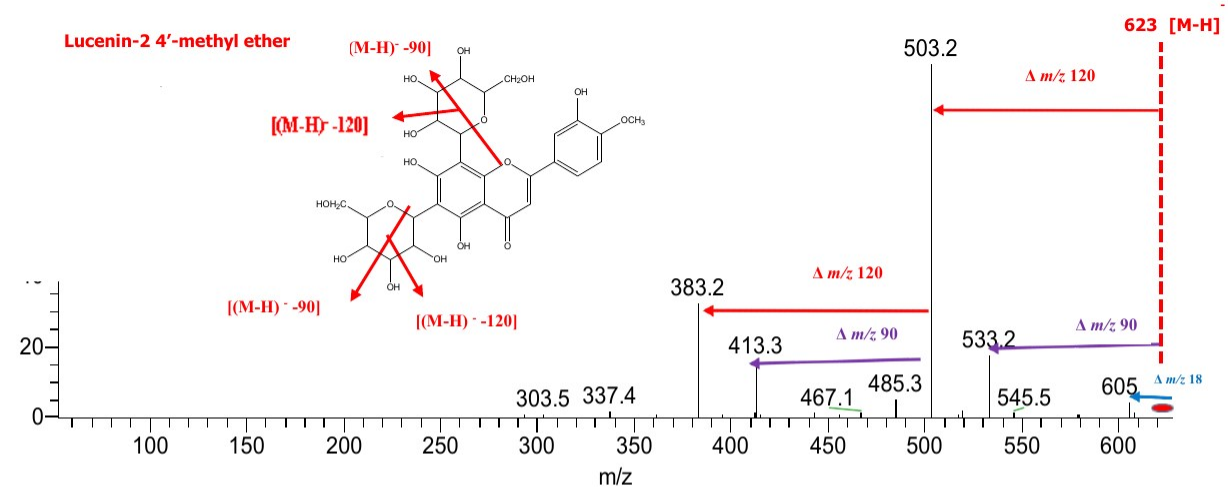
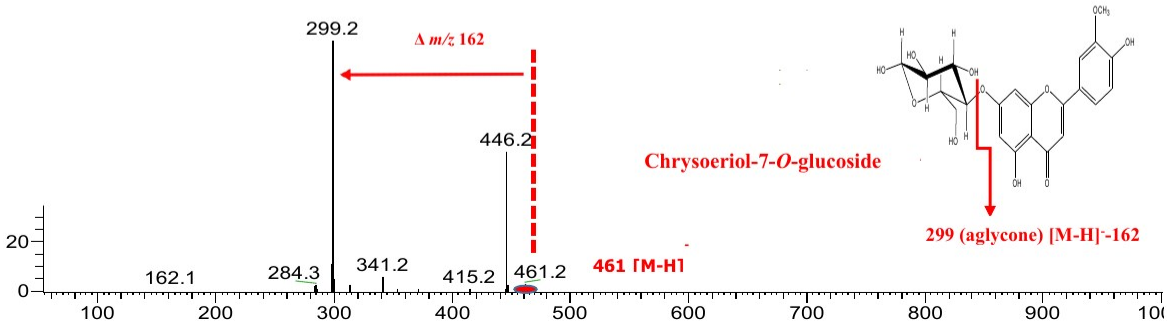
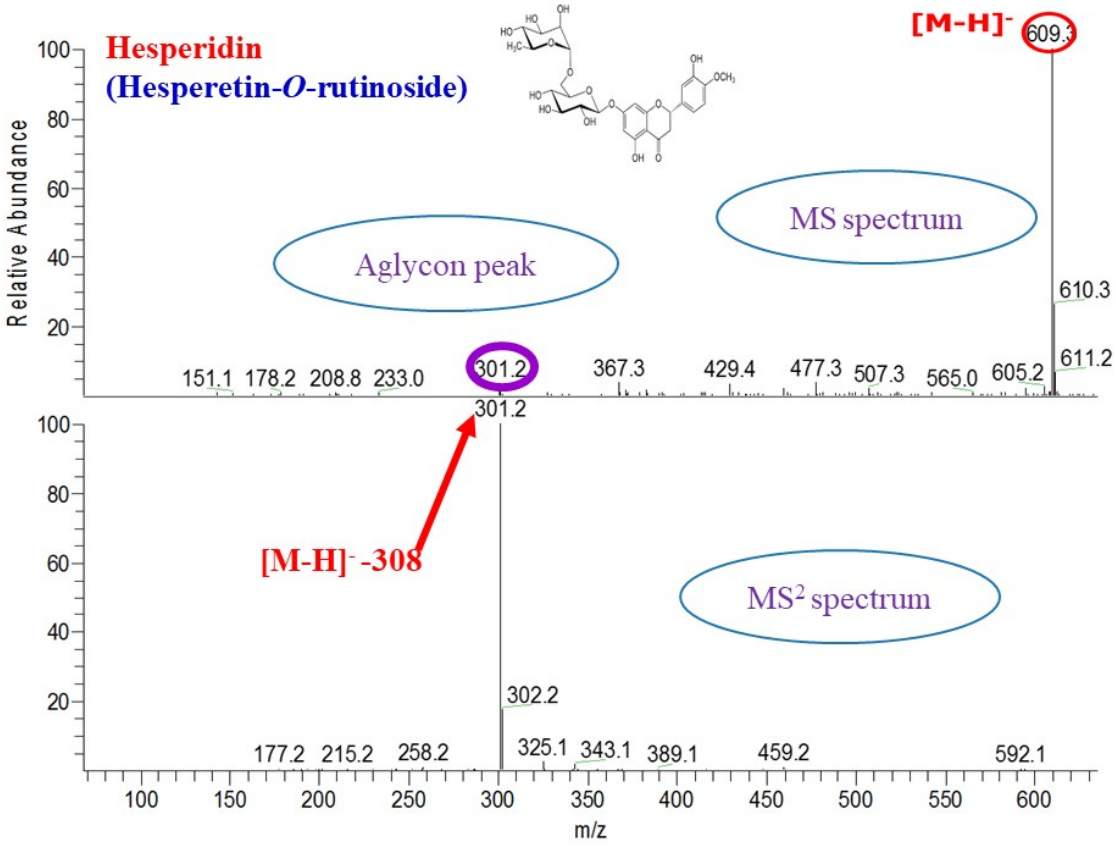


Fig. S27 MS- MS spectrum of limocitrol-O-Glc. HMG (**42**)




Lucenin-2 4′-methyl ether
(M-H)- -90]
[(M-H)- -120]
[(M-H) · -90]
[(M-H) · -120]
623 [M-H]
503.2
Δ m/z 120
Δ m/z 120
383.2
Δ m/z 90
413.3
Δ m/z 90
533.2
303.5
337.4
467.1
485.3
545.5
605
Δ m/z 18
m/z


299.2
Δ m/z 162
446.2
Chrysoeriol-7-O-glucoside
299 (aglycone) [M-H]-162
162.1
284.3
341.2
415.2
461.2
461 [M-H]


Hesperidin
(Hesperetin-O-rutinoside)
[M-H]- 609.3
MS spectrum
Aglycon peak
610.3
611.2
151.1 178.2 208.8 233.0 301.2 367.3 429.4 477.3 507.3 565.0 605.2
301.2
[M-H]- -308
MS2 spectrum
302.2
177.2 215.2 258.2 325.1 343.1 389.1 459.2 592.1
Relative Abundance
m/z

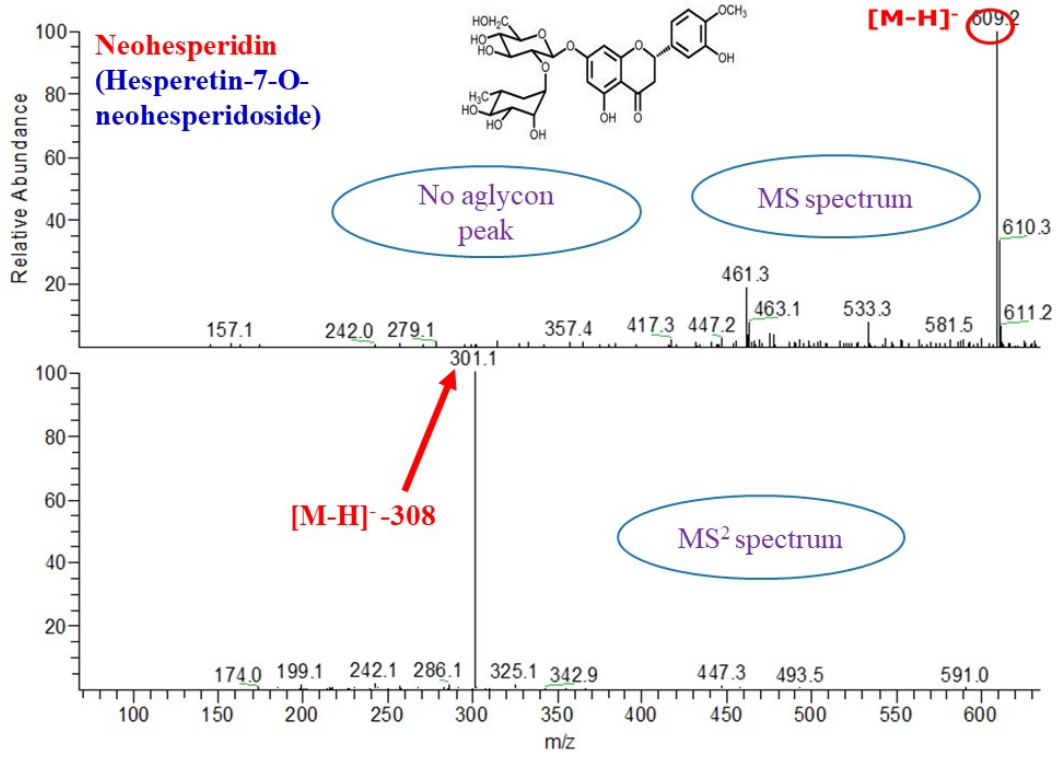

Neohesperidin
(Hesperetin-7-O-
neohesperidoside)
[M-H]- 609.2
No aglycon
peak
MS spectrum
610.3
611.2
461.3
463.1
533.3
157.1 242.0 279.1 357.4 417.3 447.2 581.5
301.1
[M-H]- -308
MS2 spectrum
174.0 199.1 242.1 286.1 325.1 342.9 447.3 493.5 591.0
Relative Abundance
m/z

Fig. S28: MS/MS fragmentation pathways of some selected compounds

Supplementary Texts: Characterization of the isolated compounds

Text S1: Identification of compound C1 (Nobiletin): white flakes (55 mg) with R_f 0.5 and 0.69 (S2 and S3, respectively). UV: λ_{max} (MeOH) nm: 248 (sh), 270 (sh), 333; (+NaOMe): 248 (sh), 270 (sh), 332; (+ $AlCl_3$): 245 (sh), 269 (sh), 331; (+ $AlCl_3$+ HCl): 247 (sh), 269 (sh), 332; (+ NaOAc): 248 (sh), 270 (sh), 332; (+ NaOAc+Boric acid): 248 (sh), 270 (sh), 332. EI-MS: *m/z* (relative abundance %): 402 (M^+, 27), 387 (100), 371 (6.3), 359 (6.1), 344 (13), 182 (6.3), 162 (4.0), 153 (2.3), 147 (2.0), 119 (1.8), 91 (2.8) and 83 (6.7).^{1}H-NMR (400 MHz, $CDCl_3$): δ ppm 6.72 (1H, *s*, H-3), 7.40 (1H, *d*, J=2, H-2`), 6.98 (1H, *d*, J=8.4, H-5`), 7.57 (1H, *dd*, J=2, 8.4, H-6`), 4.90 (3H, *s*, 5-OCH_3), 4.01 (3H, *s*, 6-OCH_3), 3.96 (3H, *s*, 7-OCH_3), 3.95 (3H, *s*, 8- OCH_3), 3.94 (3H, *s*, 3□-OCH_3) and 3.94 (3H, *s*, 4□-OCH_3). ^{13}C-NMR (100 MHz, $CDCl_3$): δ ppm 161.36 (C-2), 106.77 (C-3), 177.44 (C-4), 144.25 (C-5), 136.08 (C-6), 151.63 (C-7), 147.81 (C-8), 148.49 (C-9), 114.76 (C-10), 124.00 (C-1`), 108.68 (C-2`), 149.39 (C-3`), 152.13 (C-4`), 111.34 (C-5`), 119.83 (C-6`), 61.77 (5-OCH_3), 62.37 (6- OCH_3), 62.07 (7- OCH_3), 61.91 (8- OCH_3), 56.19 (3□-OCH_3) and 56.07 (4□-OCH_3). Spectral data of UV, EI-MS and NMR of this compound were found to be identical to nobiletin upon comparison with the reported data.[1]

Text S2: Identification of compound C2 (Isosinensetin): White needles (75 mg) with R_f 0.61 (S3). UV: λ_{max} (MeOH) nm: 248 (sh), 270 (sh), 338; (+ NaOMe): 247 (sh), 269 (sh), 340; (+ $AlCl_3$): 240 (sh), 270(sh), 342; (+ $AlCl_3$+ HCl): 239 (sh), 270 (sh), 345; (+ NaOAc): 248 (sh), 270 (sh), 338; (+ NaOAc+ Boric acid): 248 (sh), 270 (sh), 339. EI-MS *m/z* (relative abundance %): 372 (M^+, 74.66), 357 (100), 342 (17.43), 329 (23.6), 328 (32.4), 327 (23.3), 313 (6.3), 312 (2.0), 299 (12.8), 298 (5.2), 297 (1.4), 283 (1.6), 167 (1.0) and 162 (1.1).^{1}H-NMR (400 MHz, $CDCl_3$): δ

ppm 6.72 (1H, *s*, H-3), 6.44 (1H, *s*, H-6), 7.42 (1H, *d*, J=2, H-2'), 6.99 (1H, *d*, J=8.4, H-5'), 7.59 (1H, *dd*, J=2, 8.2, H-6'), 4.01 (3H, *s*, 5-OCH_3), 3.99 (3H, *s*, 7-OCH_3), 3.97 (3H, *s*, 8-OCH_3), 3.95 (3H, *s*, 3`-$OCH_3$) and 3.95 (3H, *s*, 4`-OCH_3). ^{13}C-NMR-APT (100 MHz, $CDCl_3$): δ ppm 161.02 (C-2), 106.69 (C-3), 177.89 (C-4), 156.40 (C-5), 92.65 (C-6), 156.79 (C-7), 130.71 (C-8), 151.95 (C-9), 109.44 (C-10), 123.86 (C-1`), 108.62 (C-2`), 149.28 (C-3`), 151.95 (C-4`), 111.23 (C-5`), 119.81 (C-6`), 56.36 (5-OCH_3), 56.63 (7-OCH_3), 61.52 (8-OCH_3), 56.09 (3`-$OCH_3$) and 55.97 (4`-OCH_3). The above spectral data are identical for isosinensetinwith the reported one.[2]

Text S3: Identification of compound C3 (Limonin): White needles (45 mg) with R_f value 0.74 (S3). EI-MS, *m/z* (relative abundance %): 413 (M^+-57, 1.82), 347 (100), 329 (8.16), 287 (6.22), 241 (3.83), 201 (4.91), 187 (5.58), 147 (6.46), 136 (9.10), 135 (19.08), 108 (19.94), 95 (39.22), 69 (18.33) and 43 (27.15). ^{1}H-NMR (400 MHz, DMSO-*d6*): δ ppm 4.04 (1H, *br. s*, H-1), 2.23 (1H, *dd*, J=3.2, 16, H-2a), 2.68 (1H, *dd*, J=2, 16.8 H-2b), 2.46 (1H, *dd*, J=3.2, 14.4, H-5), 2.98 (1H, *dd*, J=3.6, 16.8, H-6a), 2.85 (1H, *t*, J=15.2, H-6b), 2.55 (1H, *dd*, J=2.8, 12.6, H-9), 1.85 (1H, *m*, H-11a), 1.91 (1H, *m*, H-11b), 1.50 (1H, *m*, H-12a), 1.77 (1H, *m*, H-12b), 4.04 (1-H, *br. s*, H-15), 5.47 (1-H, *s*, H-17), 1.18 (3H, *s*, H-18), 4.46 (1H, *d*, J=12.8, H-19a), 4.75 (1H, *d*, J=13.2, H-19b), 7.41 (1H, *br. s*, H-21), 6.34 (1H, *br. s*, H-22), 7.40 (1H, *br. s*, H-23), 1.07 (3H, *s*, H-24), 1.29 (3H, *s*, H-25) and 1.17 (3H, *s*, H-26).^{13}C-NMR (100 MHz, DMSO-*d6*): δ ppm 79.3 (C-1), 35.8 (C-2), 169.23 (C-3), 80.46 (C-4), 61.71 (C-5), 36.54 (C-6), 206.23 (C-7), 51.48 (C-8), 48.27 (C-9), 46.09 (C-10), 19.07 (C-11), 30.31 (C-12), 38.09 (C-13), 65. 81 (C-14), 53.99 (C-15), 166.75 (C-16), 77.94 (C-17), 17.77 (C-18), 65.50 (C-19), 120.12 (C-20), 143.39 (C-21), 109.82 (C-22), 141.26 (C-23), 20.86 (C-24), 31.00 (C-25) and 21.53 (C-26). This compound was confirmed upon comparison of their spectral data with the available literature [1]).

Text S4: Identification of compound C4 (4□-Demethylnobiletin): yellow crystals (48 mg) with R_f value 0.9 (S2). UV: λ_{max} (MeOH) nm: 252 (sh), 278, 340; (+NaOMe): 291, 313, 391 (sh); (+ $AlCl_3$): 281, 354; (+ $AlCl_3$+ HCl): 283, 353; (+ NaOAc): 252 (sh), 280, 345; (+ NaOAc+Boric acid): 283, 336. EI-MS, *m/z* (relative abundance %): 388 (M^+, 13.0), 373 (25.1), 358 (35.5), 357 (22.3), 344 (20.6), 343 (100), 328 (13.3), 313 (7.2), 225 (0.9), 197 (1.1), 151 (2.6) and 148 (3.2).^{1}H-NMR (400 MHz, $CDCl_3$): δ ppm 6.64 (1H, *s*, H-3), 7.45 (1H, *d*, J=2, H-2`), 7.03 (1H, *d*, J=8, H-5`), 7.61 (1H, *dd*, J=8, 2, H-6`), 4.14 (3H, *s*, O-CH_3), 4.01 (3H, *s*, O-CH_3), 4.01 (3H, *s*, O-CH_3), 4.00 (3H, *s*, O-CH_3), and 3.98 (3H, *s*, O-CH_3). ^{13}C-NMR-APT (100 MHz, $CDCl_3$): δ ppm 161.75 (C-2), 111 104.02 (C-3), 178.60 (C-4), 144.46 (C-5), 137.29 (C-6), 151.15 (C-7), 147.46 (C-8),148.44 (C-9), 114.48 (C-10), 124.14 (C-1`), 108.80 (C-2`), 150.03 (C- 3`), 151.15 (C- 4`), 111.30 (C- 5`), 120.17 (C- 6`), 61.74 (5- OCH_3), 56.02 (6-OCH_3), 62.08 (7-OCH_3), 56.15 (8-OCH_3) and 61.15 (3□-OCH_3). These spectral data are matching with the previously reported ones [1]).

Text S5: Identification of compound C5 (Stigmasterol-O-*β*-D-glucoside): yellowish white amorphous powder (39 mg) with R_f 0.6 (S3). EI-MS, *m/z* (relative abundance %): 412 [M^+ - sugar] (1), 397 (64.2), 396 (100), 394 (23.5), 382 (17.4), 381 (13.5), 329 (1.1), 303 (1.2), 255 (25.3), 213 (16.4), 189 (5.8), 173 (10.9), 157 (8.2), 145 (37.6), 131 (14.6), 117 (8.4), 105 (21.7), 93 (20.6), 81 (29.7), 69 (27.9), and 55 (19). ^{1}H- NMR **(**400 MHz; DMSO-d_6): δ (ppm): 3.64 (1H, *m*, H-3), 5.32 (1H, *br s*., H-6), 0.66 (3H, *s*, H-18), 0.98 (3H, *s*, H-19), 0.90 (3H, *d,* J = 6.4 Hz, H-21), 4.87 (1H, *m*, H-22), 4.42 (1H, *t,* J = 5.6 Hz, H-23), 0.79 (3H, *d*, J = 7.2 Hz, H-26), 0.79 (3H,

d, J = 6.8 Hz, H-27), 0.83 (3H, *d*, J = 6.8 Hz, H-29), 4.22 (1H, *d*, J= 7.6 Hz, H-1`), 3- 3.6 (4H, *m*, sugar protons 2`, 3`, 4`, 5`), 2.89 (1H, m, H-6`α), 2.4 (1H, m, H-6`β) and 1 – 2.9 (16H, CH_2 of steroid nucleus and side chain).^{13}C-NMR (100 MHz, DMSO-*d6*): δ ppm 36.84 (C-1), 31.43 (C-2),73.47 (C-3), 41.86 (C-4), 140.45 (C-5), 121.21 (C-6), 31.36 (C-7), 31.39 (C-8), 49.62 (C-9), 36.22 (C-10), 19.72 (C-11), 38.32 (C-12), 45.15 (C-13), 56.19 (C-14), 23.88 (C-15),28.71 (C-16), 55.44 (C-17), 11.7 (C-18), 18.63 (C-19), 35.5 (C-20), 20.95 (C-21), 138.04 (C-22), 128.84 (C-23), 50.61 (C-24), 28.7 (C-25), 19.11 (C-26), 18.94 (C-27), 25.45 (C-28), 11.68 (C-29), 100.81 (C-1□), 76.95 (C-2□), 76.76 (C-3□), 70.09 (C-4□), 76.74 (C-5□) and 61.09 (C-6□). The characterization of this compound depends on comparison with literature.[3,4]

Text S6: Identification of compound C6 (Hesperidin): Buff amorphous powder (830 mg) with R_f 0.5 (S3). λ_{max} (MeOH) nm: 283, 324 (sh.); (+NaOMe): 242, 287, 361; (+ $AlCl_3$): 306, 380 (sh); (+ $AlCl_3$+ HCl): 305, 381; (+ NaOAc): 283, 325 (sh); (+ NaOAc+Boric acid): 283, 325 (sh). EI-MS: *m/z* (relative abundance %): 302 [M^+ - 308] (28.48), 301 (12.93), 286 (10.41), 285 (8.95), 271 (4.89), 259 (3.66), 179 (32.23), 165 (10.65), 152 (13.76), 150 (64.78), 137 (100), 135 (64.61), 129 (15.72), 124 (24.51), 111 (10.85), 107 (20.83), 84 (37.13), 78 (10.31), 77 (21.76), 73 (32.65), 71 (39.32), 69 (41.87), 60 (42.58), 57 (32.52) and 43 (40.68).^{1}H-NMR (400 MHz, DMSO-*d6*): δ ppm 5.50 (1H, *dd*, J=4, 12.4, H-2), 3.27 (1H, *m*, H-3a), 2.78 (1H, *dd*, J= 2.6, 17.2, H-3b), 6.12 (1H, *d*, J=1.2, H-6), 6.14 (1H, *d*, J=1.2, H-8), 6.94 (1H, *d*, J=1.6, H-2'), 6.96 (1H, *d*, J=8, H-5'), 6.92 (1H, *dd*, J=1.6, 11.6, H-6'), 4.97 (1H, *d*, J=6.8, H-1''), 4.52 (1H, *br.s*, H-1'''), 3.14- 3.63 (10 H, *m*, sugar protons), 1.08 (3H, *d*, J=5.6, CH_3), 12.02 (1H, *s*, 5-OH), 9.1 (1H, s, 3□-OH) and 3.77 (3H, *s*, O-CH_3). ^{13}C-NMR (100 MHz, DMSO-*d6*): δ ppm 78.38 (C-2), 42.02 (C-3), 197.04 (C-4), 163.04 (C-5), 96.38 (C-6), 165.14 (C-7), 95.55 (C-8), 162.50 (C-9), 103.32

(C-10), 130.90 (C-1`), 114.15 (C-2`), 146.46 (C-3`), 147.97 (C-4`), 112.03 (C-5`), 117.97 (C-6`), 99.45 (C-1"), 70.27 (C-2"), 75.52 (C-3"), 68.32 (C-4"), 76.27 (C-5"), 66.02 (C-6"), 100.60 (C-1'"), 69.60 (C-2'"), 70.27 (C-3'"), 72.99 (C-4'"), 75.52 (C-5'") 17.84 (CH_3) and 55.69 (O-CH_3). Hesperidin was identified by comparison their spectral data with the available literature and Co-TLC with authentic sample.[1]

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