Supplementary information

Isolation and Characterization of Auronlignan Derivatives with Hepatoprotective and Hypolipidemic Activities from the Fruits of *Hippophae rhamnoides* L.[1]

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Table S1 ^{1}H NMR (400 MHz, Acetone-d_6) and ^{13}C NMR (100 MHz, Acetone-d_6) of compounds (**1**-**3**).

No.	**1**		**2**		**3**	
	δ_H	δ_C	δ_H	δ_C	δ_H	δ_C
1	-	-	-	-	-	-
2	-	143.6	-	143.7	-	143.6
3	-	182.1	-	182.1	-	182.1
4	7.83(dd,2.0,8.0)	127.8	7.84(dd,2.0,8.0)	127.9	7.83(dd,2.0,8.0)	127.8
5	6.41(d,8.0)	114.7	6.41(d,8.0)	114.7	6.41(d,8.0)	114.7
6	-	164.7	-	164.7	-	164.7
7	6.44(d,2.0)	101.9	6.45(d,2.0)	101.8	6.44(d,2.0)	101.9
8	-	168.2	-	168.4	-	168.2
9	-	116.2	-	116.3	-	116.2
10	-	128.3	-	128.3	-	128.3
1'	-	130.8	-	129.7	-	130.9
2'	6.91(s)	107.1	6.11(s)	111.4	6.12(s)	111.8
3'	-	151.2	-	150.7	-	151.1
4'	-	142.4	-	134.1	-	132.4
5'	-	127.0	-	147.0	-	151.1
6'	7.30(s)	112.4	6.23(s)	106.5	6.12(s)	111.8
1"	-	-	-	-	-	-
2"	-	143.6	-	143.7	-	143.6
3"	-	182.1	-	182.1	-	182.1
4"	7.83(dd,2.0,8.0)	127.8	7.84(dd,2.0,8.0)	127.9	7.83(dd,2.0,8.0)	127.8
5"	6.41(d,8.0)	114.7	6.41(d,8.0)	114.7	6.41(d,8.0)	114.7
6"	-	164.7	-	164.7	-	164.7
7"	6.44(d,2.0)	101.9	6.45(d,2.0)	101.8	6.44(d,2.0)	101.9
8"	-	168.2	-	168.4	-	168.2
9"	-	116.2	-	116.3	-	116.2
10"	-	128.1	-	128.1	-	128.1
1"'	-	126.2	-	126.3	-	126.2
2"'	7.31(d,8.0)	128.5	7.33(d,8.0)	129.4	7.32(d,8.0)	128.8
3"'	6.62(d,8.0)	116.6	6.63(d,8.0)	116.7	6.62(d,8.0)	116.7
4"'	-	156.4	-	157.0	-	156.4
5"'	6.62(d.8.0)	116.6	6.63(d,8.0)	116.7	6.62(d,8.0)	116.7
6"'	7.31(d.8.0)	128.5	7.33(d,8.0)	129.4	7.32(d,8.0)	128.8
1""	-	125.2	-	124.5	-	134.2
2""	7.45(d,8.0)	126.4	7.13(dd,2.0,8.0)	121.4	6.37(s)	105.0
3""	6.83(d,8.0)	117.2	6.92(d,8.0)	117,6	-	148.8
4""	-	157.8	-	148.0	-	137.1
5""	6.83(d,8.0)	117.2	-	150.6	-	148.8
6""	7.45(d,8.0)	126.4	6.65(d,2.0)	112.1	6.37(s)	105.0
7""	-	152.0	-	126.2	7.01(s)	129.2
8""	-	114.1	-	124.8	-	122.2
9""	4.63(s)	51.2	4.21(s)	48.6	4.22(s)	57.2
3""-OCH_3	-	-	-	-	3.84(s)	56.2
5""-OCH_3	-	-	3.85(s)	56.4	3.84(s)	56.2

Table S2 ^{1}H NMR (400 MHz, Acetone-d_6) and ^{13}C NMR (100 MHz, Acetone-d_6) of compounds (**4**-**6**).

No.	**4**		**5**		**6**	
	δ_H	δ_C	δ_H	δ_C	δ_H	δ_C
1	-	-	-	-	-	-
2	-	143.3	-	143.2	-	143.1
3	-	182.3	-	182.3	-	182.3
4	7.83(d,8.0)	125.0	8.28(d,8.0)	130.3	7.89(d,8.0)	126.4
5	7.02(d,8.0)	110.2	6.82(d,8.0)	112.9	7.04(d,8.0)	111.3
6	-	164.8	-	162.9	-	163.5
7	-	113.1	-	113.4	-	111.9
8	-	157.9	-	158.5	-	159.1
9	-	115.0	-	114.9	-	115.2
10	-	124.1	-	124.1	-	124.1
11	3.49(d,7.0)	22.5	-	197.2	3.65(s)	40.3
12	5.42(t,7.0,1.5)	122.6	2.72(s)	49.2	-	210.8
13	-	132.9	-	88.6	2.72(m)	40.5
1'	-	131.3	-	134.8	-	136.1
2'	6.95(s)	107.4	6.09(s)	109.0	6.10(s)	106.2
3'	-	151.0	-	150.9	-	150.6
4'	-	142.2	-	133.7	-	131.7
5'	-	127.3	-	146.8	-	150.6
6'	7.36(s)	111.9	6.13(s)	107.6	6.10(s)	106.2
1"	-	128.2	-	128.2	-	-
2"	6.95(d,8.0)	130.8	6.96(d,8.0)	130.9	6.95(d,8.0)	130.8
3"	6.63(d,8.0)	116.3	6.62(d.8.0)	116.5	6.62(d,8.0)	116.5
4"	-	156.1	-	156.2	-	156.1
5"	6.63(d,8.0)	116.3	6.62(d,8.0)	116.5	6.62(d,8.0)	116.5
6"	6.95(d,8.0)	130.8	6.96(d,8.0)	130.9	6.95(d,8.0)	130.8
7"	3.24(s)	42.3	3.24(s)	42.3	3.24(s)	42.3
1"'	-	125.2	-	124.5	-	134.2
2"'	7.45(d,8.0)	126.4	7.13(dd,2.0,8.0)	121.4	6.37(s)	105.0
3"'	6.83(d,8.0)	117.2	6.92(d,8.0)	117.6	-	148.8
4"'	-	157.8	-	148.0	-	137.1
5"'	6.83(d.8.0)	117.2	-	150.6	-	148.8
6"'	7.45(d.8.0)	126.4	6.65(d,2.0)	112.1	6.37(s)	105.0
7"'	-	152.0	-	126.2	7.01(s)	129.2
8"'	-	114.1	-	124.8	-	122.2
9"'	4.63(s)	51.2	4.21(s)	48.6	4.22(s)	57.2
14-CH_3	1.69(s)	25.9	1.41(s)	27.4	1.18(d,6.9)	17.8
15-CH_3	1.88(s)	18.3	1.41(s)	27.4	1.18(d,6.9)	17.8
3"'-OCH_3	-	-	-	-	3.84(s)	56.2
5"'-OCH_3	-	-	3.85(s)	56.4	3.84(s)	56.2

Table S3 ^{1}H NMR (400 MHz, Acetone-d_6) and ^{13}C NMR (100 MHz, Acetone-d_6) of compounds (**7**-**9**).

No.	**7**		**8**		**9**	
	δ_H	δ_C	δ_H	δ_C	δ_H	δ_C
1	-	-	-	-	-	-
2	-	143.1	-	143.2	-	143.1
3	-	179.8	-	179.8	-	179.8
4	7.84(d,8.0)	125.2	7.80(d,8.0)	126.8	7.76(d,8.0)	127.0
5	7.03(d,8.0)	110.4	6.62(d,8.0)	113.6	6.55(d,8.0)	112.2
6	-	164.7	-	158.9	-	162.6
7	-	113.2	-	110.7	-	114.7
8	-	158.2	-	157.4	-	157.1
9	-	115.1	-	114.7	-	115.0
10	-	142.9	-	142.8	-	142.7
11	3.50(d,7.0)	22.7	6.67(d,10.0)	115.9	6.89(d,16.5)	121.6
12	5.42(t,7.0,1.5)	122.6	5.75(d,10.0)	128.5	6.70(d,16.5)	116.9
13	-	132.9	-	81.8	-	81.5
1'	-	131.5	-	128.8	-	127.6
2'	6.93(s)	107.6	6.11(s)	109.4	6.12(s)	107.0
3'	-	151.1	-	149.9	-	149.9
4'	-	142.4	-	133.9	-	131.9
5'	-	127.4	-	146.5	-	149.9
6'	7.34(s)	111.7	6.16(s)	107.5	6.12(s)	107.0
1"	5.51(d,7.8)	101.8	5.50(d,7.8)	101.6	5.51(d,7.8)	101.7
2"	3.76(m)	75.1	3.74(m)	75.0	3.75(m)	75.1
3"	3.88(m)	78.6	3.86(m)	78.4	3.86(m)	78.5
4"	3.41(m)	72.1	3.40(m)	72.0	3.41(m)	72.2
5"	3.79(m)	74.6	3.79(m)	74.5	3.79(m)	74.4
6"a	3.49(dd,11.2,6.4)	62.7	3.50(dd,11.2,6.4)	62.6	3.51(dd,11.2,6.4)	62.6
6"b	3.90(dd,11.2,3.2)	62.7	3.92(dd,11.2,3.2)	62.6	3.93(dd,11.2,3.2)	62.6
1"'	-	125.3	-	124.3	-	134.1
2"'	7.46(d,8.0)	126.5	7.14(dd,2.0,8.0)	121.6	6.37(s)	105.2
3"'	6.84(d,8.0)	117.1	6.93(d,8.0)	117.6	-	148.6
4"'	-	157.9	-	148.2	-	137.0
5"'	6.84(d.8.0)	117.1	-	150.8	-	148.6
6"'	7.46(d.8.0)	126.5	6.65(d,2.0)	112.2	6.37(s)	105.2
7"'	-	152.0	-	126.4	7.01(s)	130.0
8"'	-	114.1	-	124.7	-	122.1
9"'	4.63(s)	51.3	4.20(s)	48.7	4.22(s)	57.2
14-CH_3	1.70(s)	26.0	1.45(s)	28.1	1.46(s)	28.4
15-CH_3	1.88(s)	18.4	1.45(s)	28.1	1.46(s)	28.4
3"'-OCH_3	-	-	-	-	3.84(s)	56.2
5"'-OCH_3	-	-	3.85(s)	56.5	3.84(s)	56.2

4. Data information of compounds (**1**-**9**).

3,3',4''',6,6''-tetrahydroxy-7'''',8''''-(4''''-hydroxy-1''''-cinnamylalcohol)-10,10''-biauronlignan (**1**): a yellow amorphous powder, HR-ESI-MS: *m/z* 669.1395 $[M + H]^+$ (calc. for $C_{39}H_{25}O_{11}$, 669.1397); UV (MeOH) λ_{max}: 204, 255, 335, 402 nm; IR (KBr) ν_{max}: 3452, 1668, 1605, 1514, 1385 cm^{-1}; ^1H NMR and ^{13}C NMR data were shown in Table S1.

3',4''',6,6''-tetrahydroxy-7'''',8''''-(4''''-hydroxy-5''''-methoxy-1''''-cinnamylalcohol)-10,10''-biauronlignan (**2**): a yellow amorphous powder, HR-ESI-MS: *m/z* 715.1453 $[M + H]^+$ (calc. for $C_{40}H_{27}O_{13}$, 715.1452); UV (MeOH) λ_{max}: 205, 255, 335, 401 nm; IR (KBr) ν_{max}: 3454, 1668, 1606, 1513, 1387 cm^{-1}; ^1H NMR and ^{13}C NMR data were shown in Table S1.

3',4''',6,6''-tetrahydroxy-4'-(4''''-hydroxy-3'''',5''''-dimethoxy-1''''-cinnamylalcohol)-10,10''-biauronlignan (**3**): a yellow amorphous powder, HR-ESI-MS: *m/z* 747.1716 $[M + H]^+$ (calc. for $C_{41}H_{30}O_{14}$, 747.1714); UV (MeOH) λ_{max}: 207, 255, 335, 403 nm; IR (KBr) ν_{max}: 3453, 1668, 1606, 1511, 1386 cm^{-1}; ^1H NMR and ^{13}C NMR data were shown in Table S1.

3',6-dihydroxy-7-prenyl-7''',8'''-(4'''-hydroxy-1'''-cinnamylalcohol)-10-(4''-hydroxy-benzyl)-auronlignan (**4**): a yellow amorphous powder, HR-ESI-MS: *m/z* 591.2017 $[M + H]^+$ (calc. for $C_{36}H_{31}O_8$, 591.2019); UV (MeOH) λ_{max}: 203, 256, 275, 403 nm; IR (KBr) ν_{max}: 3348, 1674, 1608, 1507, 1387 cm^{-1}; ^1H NMR and ^{13}C NMR data were shown in Table S2.

3'-hydroxy-6,7-(14,15-dimethyl-11-cyclohexanone)-7''',8'''-(4'''-hydroxy-5''''-

methoxy-1'''-cinnamylalcohol)-10-(4''-hydroxy-benzyl)-auronlignan (**5**): a yellow amorphous powder, HR-ESI-MS: *m/z* 651.1863 $[M + H]^+$ (calc. for $C_{37}H_{31}O_{11}$, 651.1866); UV (MeOH) λ_{max}: 202, 255, 275, 404 nm; IR (KBr) ν_{max}: 3346, 1674, 1607, 1508, 1388 cm^{-1}; ^1H NMR and ^{13}C NMR data were shown in Table S2.

3'/5'/6-trihydroxy-7-(14,15-dimethylbutan-12-one)-4'-(4'''-hydroxy-3''',5'''-methoxy-1'''-cinnamylalcohol)-10-(4''-hydroxy-benzyl)-auronlignan (**6**): a yellow amorphous powder, HR-ESI-MS: *m/z* 685.2282 $[M + H]^+$ (calc. for $C_{38}H_{37}O_{12}$, 685.2285); UV (MeOH) λ_{max}: 204, 254, 275, 401 nm; IR (KBr) ν_{max}: 3343, 1676, 1604, 1509, 1387 cm^{-1}; ^1H NMR and ^{13}C NMR data were shown in Table S2.

3',6-dihydroxy-7-prenyl-7''',8'''-(4'''-hydroxy-1'''-cinnamylalcohol)-10-O-*β*-D-glucopyranosyl-auronlignan (**7**): a yellow amorphous powder, HR-ESI-MS: *m/z* 663.2079 $[M + H]^+$ (calc. for $C_{35}H_{35}O_{13}$, 663.2078); UV (MeOH) λ_{max}: 203, 255, 275, 402 nm; IR (KBr) ν_{max}: 3346, 1675, 1610, 1511, 1388 cm^{-1}; ^1H NMR and ^{13}C NMR data were shown in Table S3.

3'-hydroxy-6,7-(14,15-dimethylchromeneprenyl)-7''',8'''-(4'''-hydroxy-5'''-methoxy-1'''-cinnamylalcohol)-10-O-*β*-D-glucopyranosyl-auronlignan (**8**): a yellow amorphous powder, HR-ESI-MS: *m/z* 707.1973 $[M + H]^+$ (calc. for $C_{36}H_{35}O_{15}$, 707.1976); UV (MeOH) λ_{max}: 202, 255, 275, 403 nm; IR (KBr) ν_{max}: 3348, 1674, 1608, 1506, 1389 cm^{-1}; ^1H NMR and ^{13}C NMR data were shown in Table S3.

3',5',6-trihydroxy-7-isopentenol-7''',8'''-(4'''-hydroxy-3''',5'''-methoxy-1'''-cinnamyl alcohol)-10-O-*β*-D-glucopyranosyl-auronlignan (**9**): a yellow amorphous powder, HR-ESI-MS: *m/z* 757.2348 $[M + H]^+$ (calc. for $C_{37}H_{41}O_{17}$, 757.2344); UV (MeOH) λ_{max}: 205, 254, 275, 402 nm; IR (KBr) ν_{max}: 3345, 1677, 1607, 1510, 1386 cm^{-1}; ^1H NMR and ^{13}C NMR data were shown in Table S3.