Supplementary Materials: New Phragmalin-Type Limonoids from *Chukrasia tabularis* and Their α -Glucosidase Inhibitory Activity

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Figure S40. HR-ESI-MS spectrum of the new compound 5.

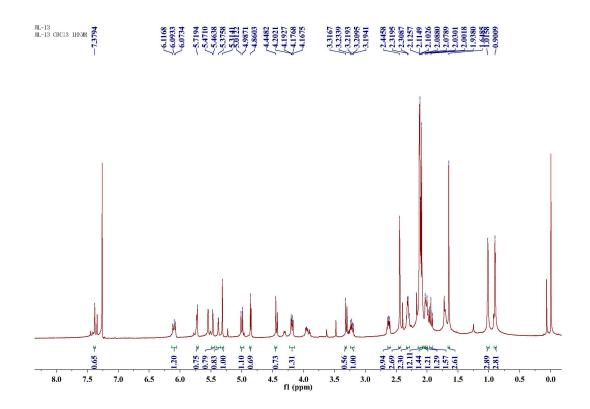


Figure S1. ¹H-NMR (500 MHz) spectrum of the new compound 1 in CDCl₃.

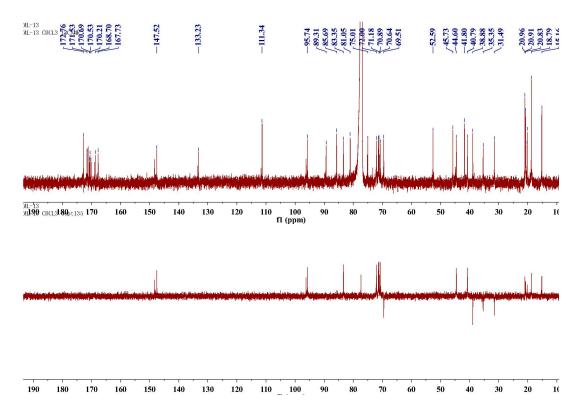
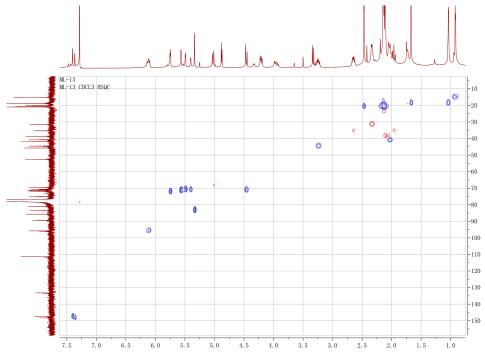
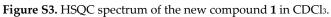


Figure S2. ¹³C-NMR (125 MHz) and DEPT NMR spectrum of the new compound 1 in CDCl₃.





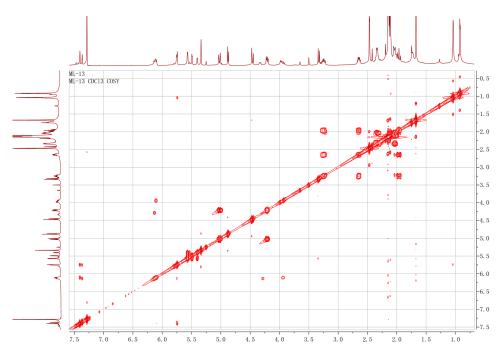
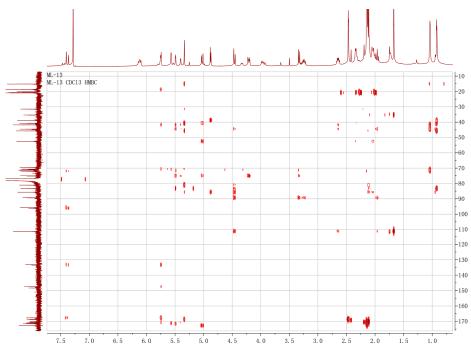
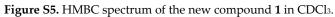
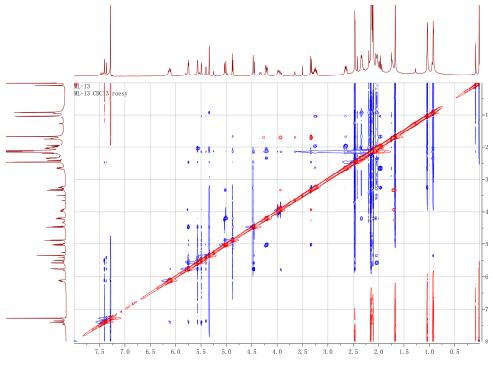


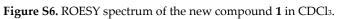
Figure S4. ¹H-¹H COSY spectrum of the new compound 1 in CDCl₃.











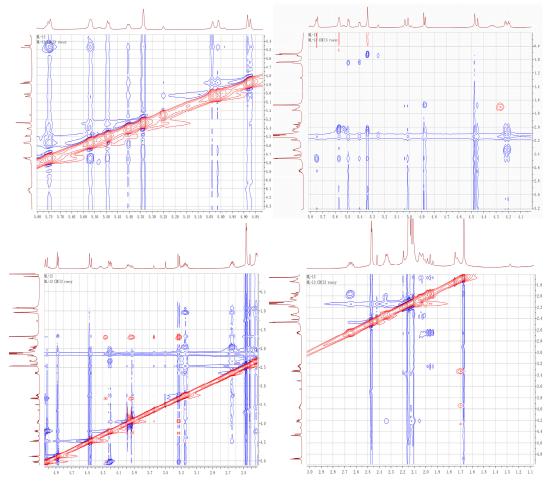


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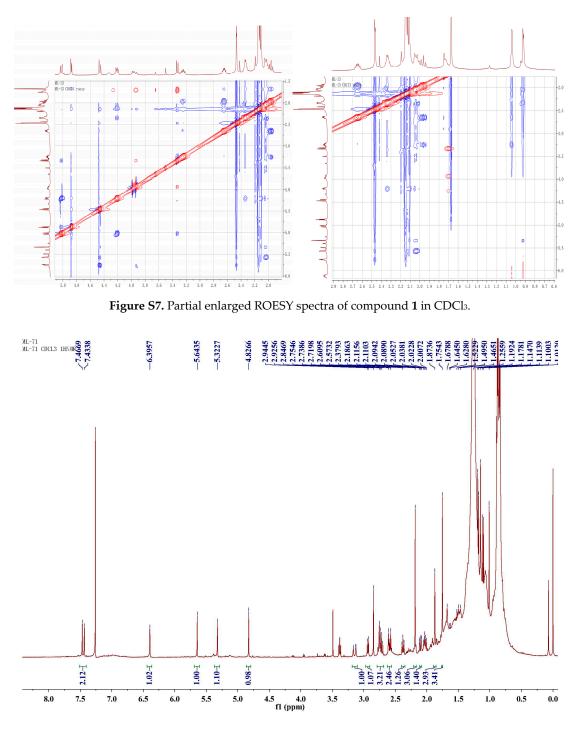


Figure S8. 1H-NMR (500 MHz) spectrum of the new compound 2 in CDCl3.

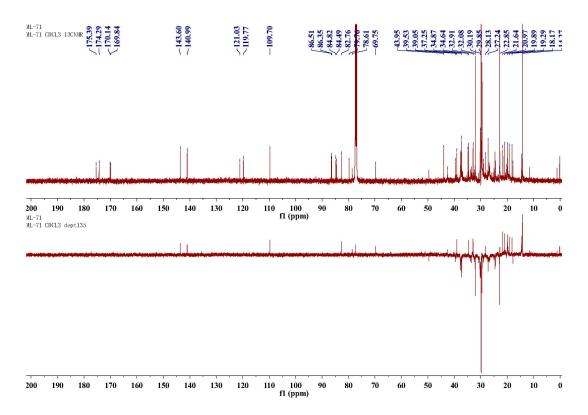
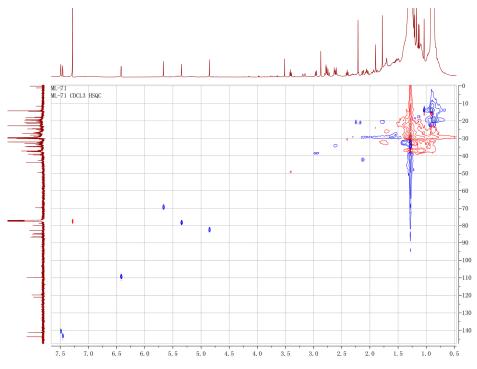
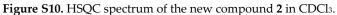


Figure S9. ¹³C-NMR (125 MHz) and DEPT NMR spectrum of the new compound 2 in CDCl₃.





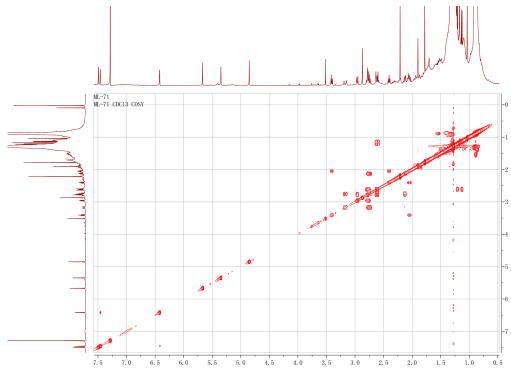
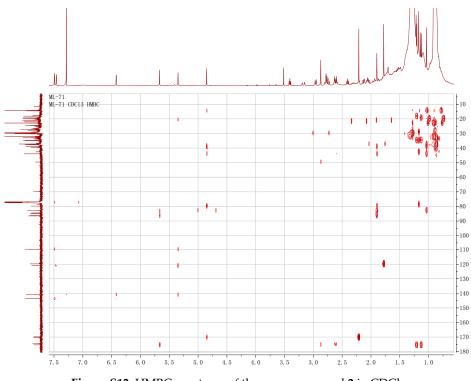
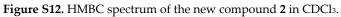


Figure S11. ¹H-¹H COSY spectrum of the new compound 2 in CDCl₃.





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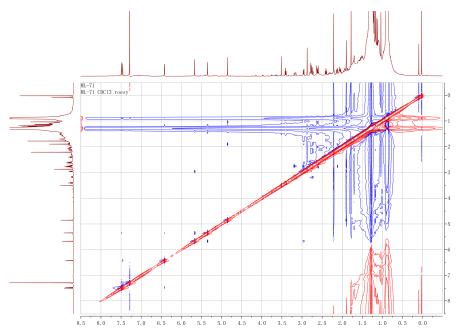


Figure S13. ROESY spectrum of the new compound 2 in CDCl₃.

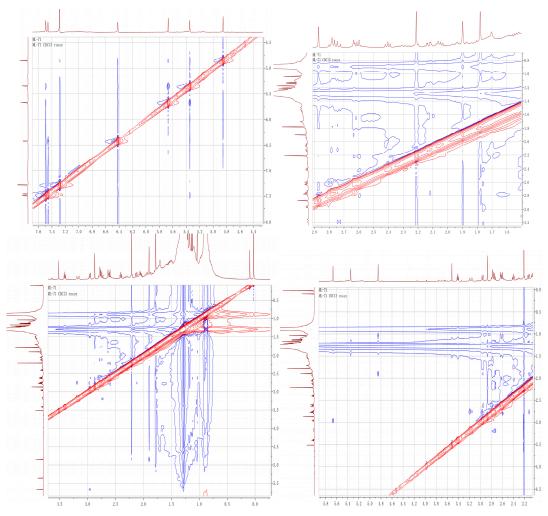


Figure S14. Partial enlarged ROESY spectra of compound 2 in CDCl₃.

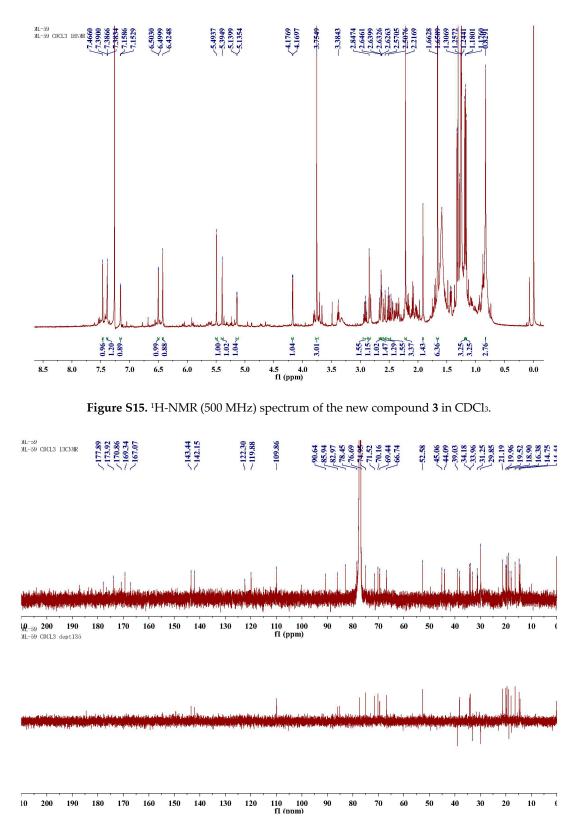


Figure S16. ¹³C-NMR (125 MHz) and DEPT NMR spectrum of the new compound 3 in CDCl₃.

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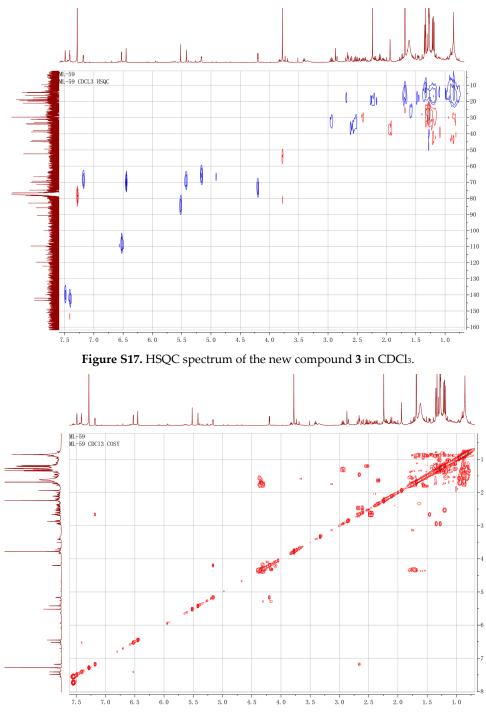


Figure S18. ¹H-¹H COSY spectrum of the new compound 3 in CDCl₃.

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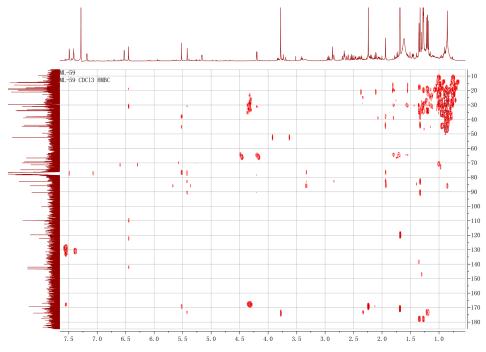
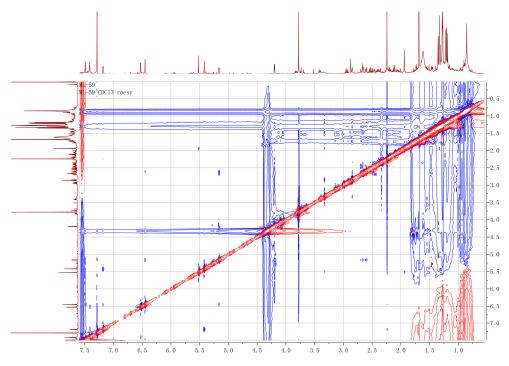
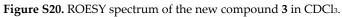


Figure S19. HMBC spectrum of the new compound 3 in CDCl₃.





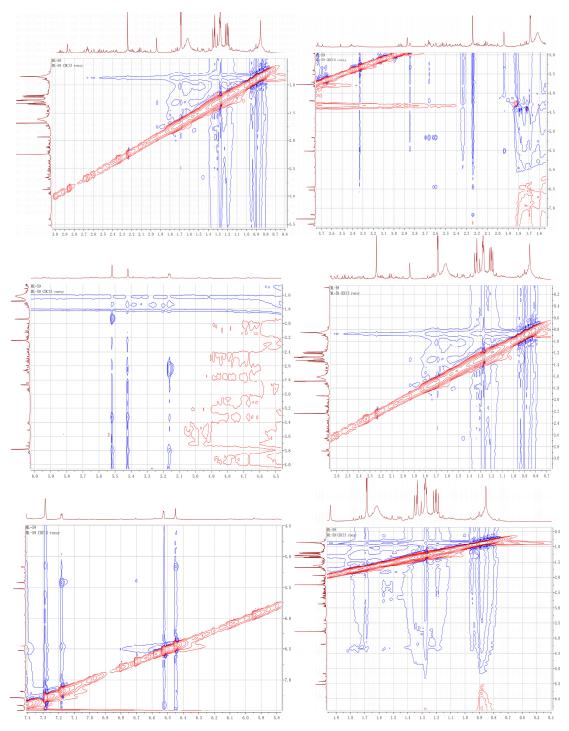


Figure S21. Partial enlarged ROESY spectra of compound 3 in CDCl₃.

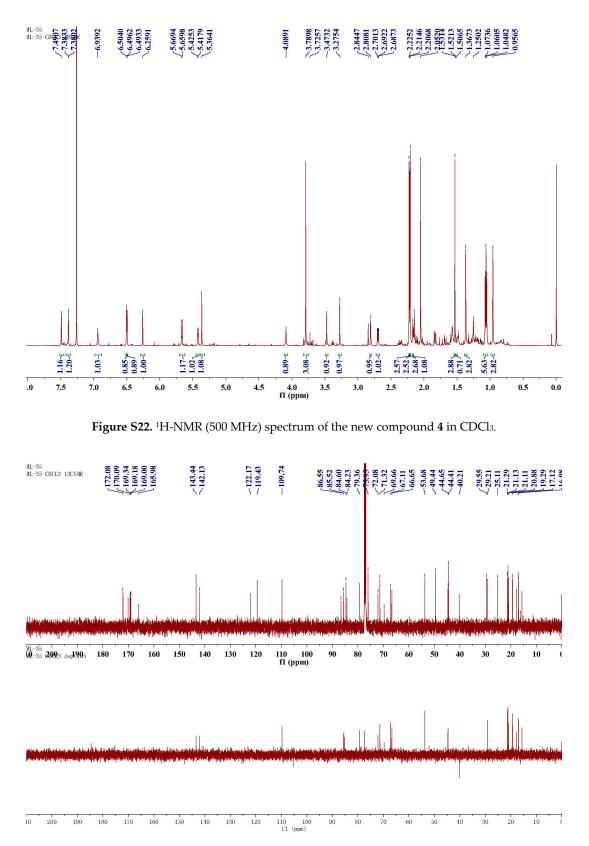


Figure S23. ¹³C-NMR (125 MHz) and DEPT NMR spectrum of the new compound 4 in CDCl₃.

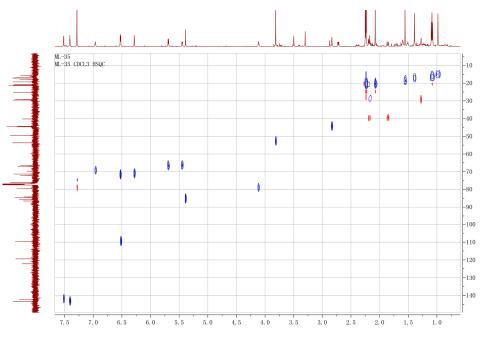


Figure S24. HSQC spectrum of the new compound 4 in CDCl₃.

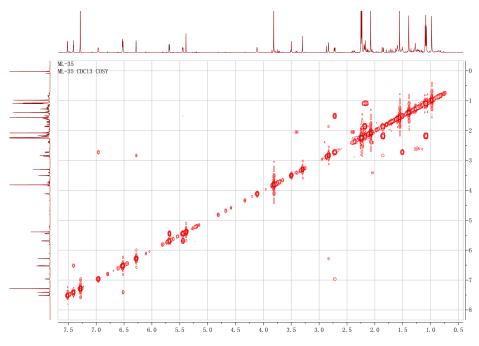
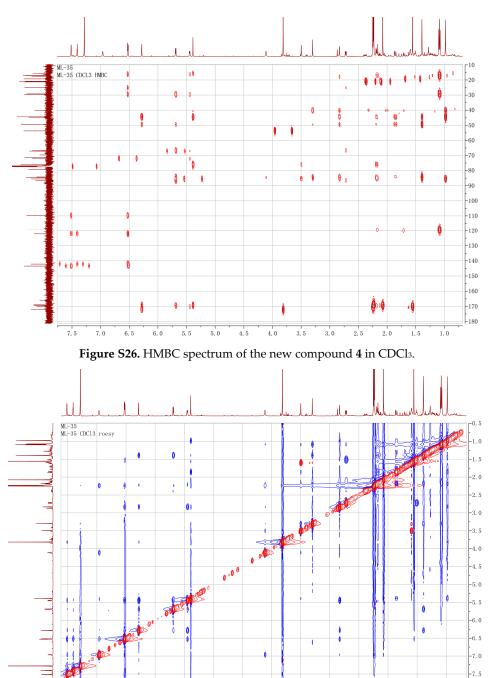
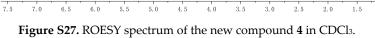


Figure S25. 1H-1H COSY spectrum of the new compound 4 in CDCl3.





1.0

7.0

6.5

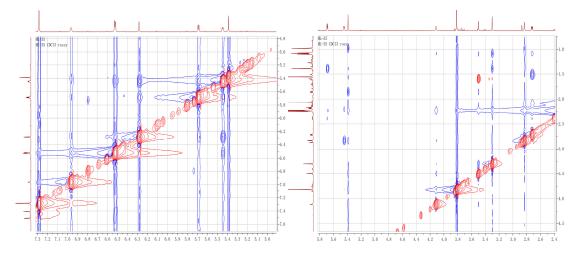


Figure S28. Partial enlarged ROESY spectra of compound 4 in CDCl3.

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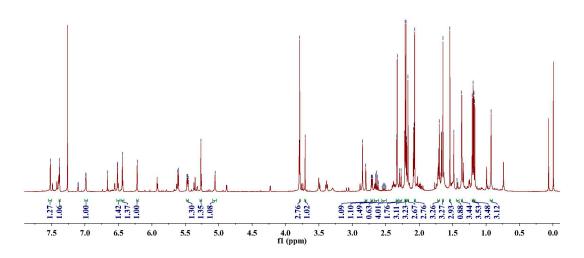


Figure S29. ¹H-NMR (500 MHz) spectrum of the new compound 5 in CDCl₃.

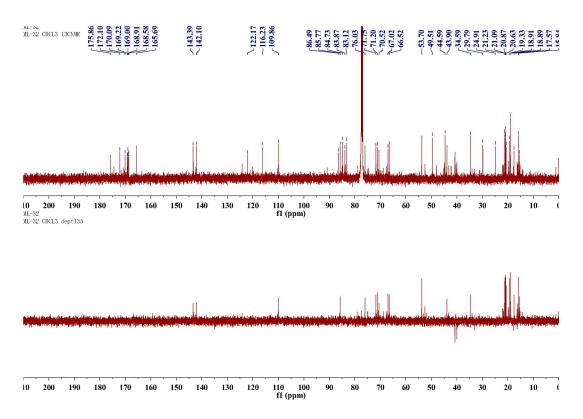
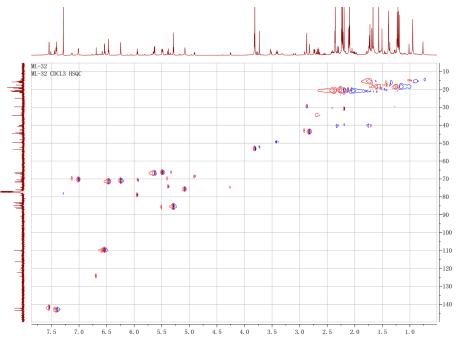
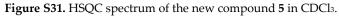


Figure S30. ¹³C-NMR (125 MHz) and DEPT NMR spectrum of the new compound 5 in CDCl₃.





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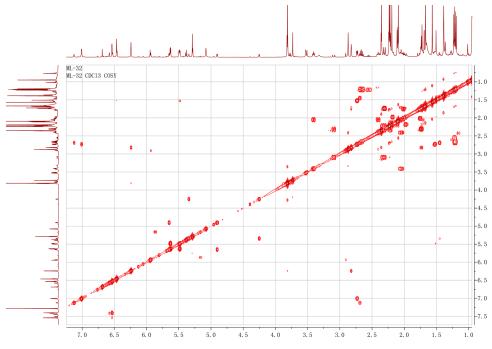


Figure S32. ¹H-¹H COSY spectrum of the new compound 5 in CDCl₃.

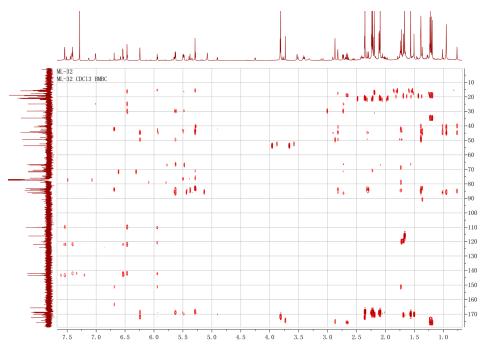


Figure S33. HMBC spectrum of the new compound 5 in CDCl₃.

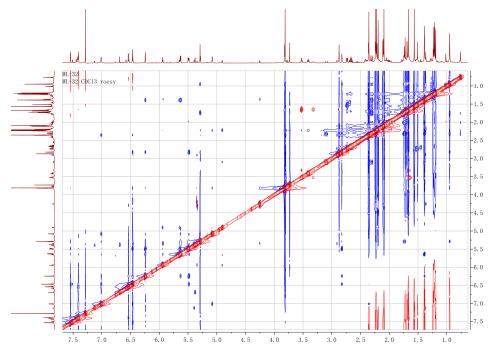


Figure S34. ROESY spectrum of the new compound 5 in CDCl₃.

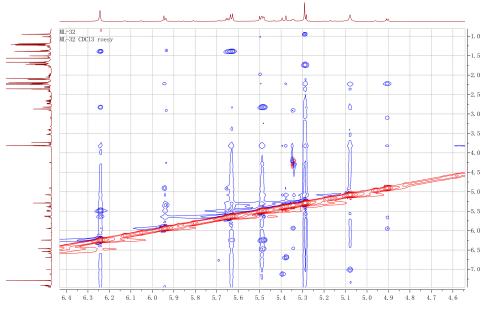


Figure S35. Cont.

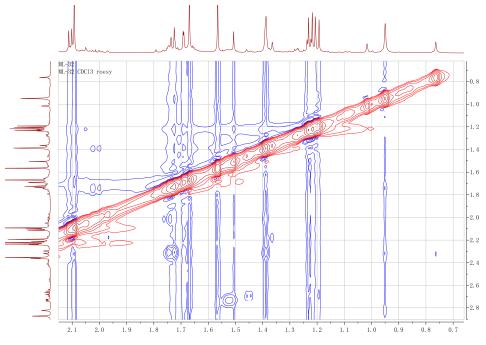


Figure S35. Partial enlarged ROESY spectra of compound 5 in CDCl₃.

Sample Group Info. Acquisition SW Version 6200 series TOF/6500 series Q-TOF B.05.01 (B5125.2) User Spectra Fragmentor Voltage Collision Energy 0 Ionization Mode ESI x10 4 + Scan (0.213-0.229 min, 2 Scans) ML-13.d. Subtract (64)	
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Figure S36. HR-ESI-MS spectrum of the new compound 1.

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Figure S37. HR-ESI-MS spectrum of the new compound 2.

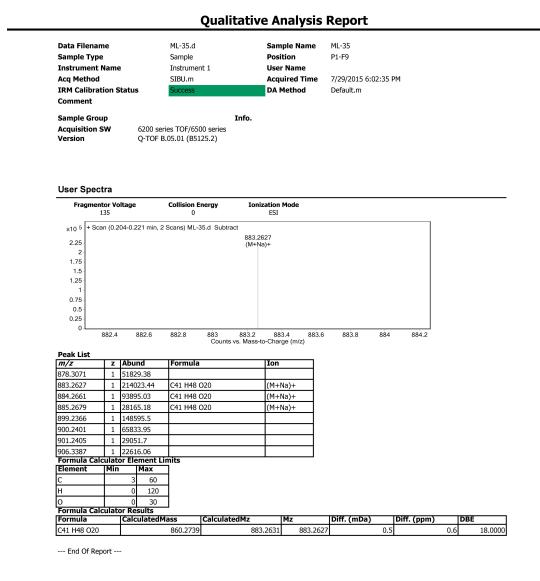
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870.2657 1 37090.45 C41 H50 018 (M+K)+ Formula Calculator Element Limits Element Min Max C 3 60 H 0 120 O 0 30 Formula Calculator Results Formula CalculatedMass CalculatedMz Mz Diff. (mDa) Diff. (ppm) DBE	Peak Lisi <i>m/z</i> 274.2734 318.2999 453.167 848.3333	t	z Ab 1 24 1 250 1 20 1 36	und 594.75 527.38 425.79 407.78	Cou	ints vs. Mass-to-Cha	irge (m/z)	\$ 869.8	870 870		
Formula Calculator Element Limits Element Min Max C 3 60 H 0 120 O 0 30 Formula Calculator Results Formula CalculatedMass CalculatedMz Mz Diff. (mDa) Diff. (ppm) DBE	Peak Lisi m/z 274.2734 318.2999 453.167 848.3333 849.3373	t	z Ab 1 249 1 250 1 204 1 364 1 364	und 594.75 527.38 425.79 407.78 535.67	Cou	ints vs. Mass-to-Cha	irge (m/z)	5 869.8	870 870		
Element Min Max C 3 60 H 0 120 O 0 30 Formula Calculator Results Formula CalculatedMass Formula CalculatedMass CalculatedMz Mz Diff. (mDa) Diff. (ppm) DBE	Peak Lisi m/z 274.2734 318.2999 453.167 848.3333 849.3373 853.2882	t	z Ab 1 24! 1 256 1 204 1 364 1 176 1 23:	und 594.75 527.38 425.79 407.78 535.67 447.75	Cou	Ints vs. Mass-to-Cha	I	5 869.8	870 870	1.2	
C 3 60 H 0 120 O 0 30 Formula Calculator Results CalculatedMz Mz Diff. (mDa) Diff. (ppm) DBE	Peak List m/z 274.2734 318.2999 453.167 848.3333 849.3373 853.2882 869.2623 870.2657	t	z Ab 1 24! 1 256 1 204 1 364 1 176 1 233 1 803 1 370	und 594.75 527.38 425.79 407.78 535.67 147.75 176.62 090.45	Cou Formula	Ints vs. Mass-to-Cha	rrge (m/z)	5 869.8	870 870		
O 0 30 Formula Calculator Results Formula CalculatedMass (CalculatedMz Mz Diff. (mDa) Diff. (ppm) DBE	Peak List m/z 274.2734 318.2999 453.167 848.3333 849.3373 853.2882 869.2623 870.2657	t	z Ab 1 249 1 256 1 204 1 364 1 176 1 233 1 803 1 370 ator E 1	und 594.75 527.38 425.79 407.78 535.67 147.75 176.62 190.45 Iement Li	Cou Formula	Ints vs. Mass-to-Cha	rrge (m/z)	5 869.8	870 870		
Formula Calculator Results Formula CalculatedMass CalculatedMz Mz Diff. (mDa) Diff. (ppm) DBE	Peak Liss m/z 274.2734 318.2999 453.167 848.3333 849.3373 853.2882 869.2623 870.2657 Formula	t	z Ab 1 24! 1 256 1 204 1 264 1 264 1 264 1 364 1 176 1 233 1 803 1 370 ator E Inn	und 594.75 527.38 425.79 407.78 535.67 447.75 76.62 190.45 Iement Li Max	Cou Formula	Ints vs. Mass-to-Cha	rrge (m/z)	5 869.8	870 870		
Formula CalculatedMass CalculatedMz Mz Diff. (mDa) Diff. (ppm) DBE	Peak Liss m/z 274.2734 318.2999 453.167 848.3333 849.3373 853.2882 869.2623 870.2657 Formula Element	t	z Ab 1 24! 1 256 1 204 1 364 1 176 1 23: 1 80: 1 376 ator E	und 594.75 527.38 425.79 407.78 535.67 147.75 5090.45 166.62 190.45 167.62 1090.45 168 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 1090.45 10	Cou Formula	Ints vs. Mass-to-Cha	rrge (m/z)	5 869.8	870 870		
	Peak Lisi <i>m/z</i> 274.2734 318.2999 453.167 848.3333 849.3373 853.2882 869.2623 870.2657 Formula Element C H O	Calcul	z Ab 1 24! 1 256 1 200 1 360 1 176 1 231 1 370 ator E	und 594.75 527.38 125.79 107.78 135.67 147.75 176.62 1090.45 Iement Li Max 3 60 0 120 0 30	Cou Formula	Ints vs. Mass-to-Cha	rrge (m/z)	5 869.8	870 870	.1.2	
	Peak Lisi m/z 274.2734 318.2999 453.167 848.3333 849.3373 853.2882 869.2623 870.2657 Formula Element C H O Formula	t Calcul Calcul	z Ab 1 24! 1 256 1 204 1 364 1 176 1 23: 1 80: 1 370 ator E In	und 594.75 527.38 425.79 407.78 335.67 447.75 5090.45 Identify and Part Li Max 3 60 0 120 0 30 0 30	Cou	Ints vs. Mass-to-Che Ion (M+ (M+	-K)+ -K)+				IDBF
	Peak Lisi m/z 274.2734 318.2999 453.167 848.3333 849.3373 853.2882 869.2623 870.2657 Formula Element C H O Formula Formula	t Calcul Calcul	z Ab 1 24! 1 256 1 204 1 364 1 176 1 23: 1 80: 1 370 ator E In	und 594.75 527.38 425.79 407.78 335.67 447.75 5090.45 Identify and Part Li Max 3 60 0 120 0 30 0 30	Cou	Ints vs. Mass-to-Che Ion (M4 (M4 (M4	rrge (m/z)	Diff. (mDa)	Diff. (p	pm)	

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Figure S38. HR-ESI-MS spectrum of the new compound 3.



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Figure S39. HR-ESI-MS spectrum of the new compound 4.

Sample Gro Acquisition Version															
				es TOF/650 05.01 (B51)	00 series	Info.									
User Spe	stra														
Fragme	ntor Vol 135	tage		Collision E	nergy	Ionization ESI	Mode								
x10 5 + So	an (0.19	2-0.225	5 min. 3 §	Scans) ML-3	32.d Subtrac	t									
1.6				,		925.2737									
1.4						(M+Na)+									
1.2															
1-															
0.8															
0.6															
0.4															
0.4 - 0.2 -															
0.4	924.4	924	4.6	924.8		925.2 92	5.4 9	925.6	925.8	926	926.2	2			
0.4 - 0.2 - 0 -	924.4	924	4.6	924.8		925.2 92 s. Mass-to-Cha	5.4 g ge (m/z)	925.6	925.8	926	926.2	2			
0.4 0.2 0 Peak List					Counts v	s. Mass-to-Cha	5.4 g ge (m/z)	925.6	925.8	926	926.2	2			
0.4- 0.2- 0- Peak List <i>m/z</i>	z	Abunc	d	924.8 Formula	Counts v	925.2 92 s. Mass-to-Cha	5.4 9 ge (m/z)	925.6	925.8	926	926.2	2			
0.4 - 0.2 - 0 - Peak List <i>m/z</i> 899.2368	z	Abunc 67953.	d .05		Counts v	s. Mass-to-Cha	5.4 g ge (m/z)	925.6	925.8	926	926.2	2			
0.4- 0.2- 0 Peak List <i>m/z</i> 899.2368 900.2403	z 1	Abunc 67953. 31764.	d .05 .8		Counts v	s. Mass-to-Cha	5.4 \$ ge (m/z)	925.6	925.8	926	926.2	2			
0.4 - 0.2 - 0 - Peak List <i>m/z</i> 899.2368	z 1 1 1	Abunc 67953.	d .05 .8 .2		Counts v	s. Mass-to-Cha	5.4 \$ ge (m/z)	925.6	925.8	926	926.2	2			
0.4- 0.2- 0- Peak List <i>m/z</i> 899.2368 900.2403 920.3182	z 1 1 1 1	Abunc 67953. 31764. 63077.	d .05 .8 .2 .12		Counts v	s. Mass-to-Cha	5.4 s ge (m/z) Na)+	925.6	925.8	926	926.2	2			
0.4- 0.2- 0- Peak List <i>m/z</i> 899.2368 900.2403 920.3182 921.3218	z 1 1 1 1 1 1	Abunc 67953. 31764. 63077. 28484.	d .05 .8 .2 .12 2.28	Formula	Counts v	s. Mass-to-Cha	ge (m/z)	925.6	925.8	926	926.2	2			
0.4- 0.2- 0 Peak List <i>m/z</i> 899.2368 900.2403 920.3182 921.3218 925.2737	z 1 1 1 1 1 1 1 1 1	Abunc 67953. 31764. 63077. 28484. 152962	d .05 .8 .2 .12 2.28 .54	Formula C43 H50 C	Counts v	s. Mass-to-Cha	nge (m/z)	925.6	925.8	926	926.2	2			
0.4 0.2 0 Peak List 899.2368 900.2403 920.3182 925.2737 926.2772 941.2477 941.2477	z 1 1 1 1 1 1 1 1 1 1 1 1	Abunc 67953. 31764. 63077. 28484. 152962 67624. 106957 51154.	d .05 .8 .2 .12 2.28 .54 7.15 .05	Formula C43 H50 C C43 H50 C	Counts v	s. Mass-to-Cha	nge (m/z)	925.6	925.8	926	926.2	2			
0.4 0.2 0 Peak List <i>m/z</i> 899.2368 900.2403 920.3182 921.3218 925.2737 926.2772 941.2477 942.2508	z 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Abunc 67953. 31764. 63077. 28484. 152962 67624. 106957 51154. r Elem	d .05 .8 .2 .12 2.28 .54 7.15 .05 ment Lin	Formula C43 H50 C C43 H50 C	Counts v	s. Mass-to-Cha	nge (m/z)	925.6	925.8	926	926.2	2			
0.4 0.2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	z 1 1 1 1 1 1 1 1 1 1 1 1	Abunc 67953. 31764. 63077. 28484. 152962 67624. 106957 51154. r Elem	d .05 .8 .2 .12 2.28 .54 7.15 .05 ment Lin fax	Formula C43 H50 C C43 H50 C	Counts v	s. Mass-to-Cha	nge (m/z)	925.6	925.8	926	926.2	2			
0.4 0.2 0 899.2368 900.2403 920.3182 921.3218 925.2737 941.2477 942.2508 Formula Ca Element C	z 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Abund 67953. 31764. 63077. 28484. 152962 67624. 106957 51154. r Elem M 3	d .05 .8 .2 .12 2.28 .54 7.15 .05 ment Lin fax 60	Formula C43 H50 C C43 H50 C	Counts v	s. Mass-to-Cha	nge (m/z)	925.6	925.8	926	926.2	22			
0.4 0.2 0 899.2368 900.2403 920.3182 921.3218 925.2737 926.2772 926.2772 941.2477 942.2508 Formula Ca Element C H	z 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Abund 67953. 31764. 63077. 28484. 152962 67624. 106957 51154. r Elern M 3 0	d .05 .8 .2 .12 2.28 .54 7.15 .05 nent Lin 4ax .60 .120	Formula C43 H50 C C43 H50 C	Counts v	s. Mass-to-Cha	nge (m/z)	925.6	925.8	926	926.2	22			
0.4 0.2 0 Peak List <i>m/z</i> 899.2368 900.2403 920.3182 921.3218 925.2737 921.2218 921.2477 941.2477 942.2508 Formula Ca Element C H O O	z 1 1 1 1 1 1 1 1 1 1 1 1 1	Abunc 67953. 31764. 63077. 28484. 152962 67624. 106957 51154. r Elem M 3 0 0	d .05 .8 .2 .12 2.28 .54 7.15 .05 ment Lir 4ax 60 120 30	Formula C43 H50 C C43 H50 C	Counts v	s. Mass-to-Cha	nge (m/z)	925.6	925.8	926	926.2	2			
0.4 0.2 0 899.2368 900.2403 920.3182 921.3218 925.2737 926.2772 9241.2477 942.2508 Formula Ca Element C H	z 1 1 1 1 1 1 1 1 1 1 1 1 1	Abunc 67953. 31764. 63077. 28484. 152962 67624. 106957 51154. r Elem 3 0 0 0	d .05 .8 .2 .12 2.28 .54 7.15 .05 ment Lir 4ax 60 120 30	Formula C43 H50 C C43 H50 C	Counts v	S. Mass-to-Cha	nge (m/z)		925.8	926	926.2 Diff. (pp		[D	BE	

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Figure S40. HR-ESI-MS spectrum of the new compound 5.