SUPPLEMENTARY MATERIAL

Benzophenanthridine alkaloids from the roots of *Thalictrum microgynum* Lecoy.ex Oliv.

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Abstract: А benzophenanthridine new alkaloid. 2,3,9-trimethoxy-7,8-methylenedioxy-5-methylbenzo[c]-6(5H) phenanthridone (2) and benzophenanthridine alkaloid first found from natural sources. a 2,3-dimethoxy-7,8- methylenedioxy-5-methylbenzo[c]-6(5H)- phenanthridone (1) together with two known benzophenanthridine alkaloids, Dihydrosanguinarine (3) and Dihydrochelilutine (4) were isolated from the roots of Thalictrum microgynum Lecoy.ex Oliv. The structures of 1 and 2 were elucidated using various spectroscopic techniques including HRESIMS and 1D and 2D NMR. Antibacterial activity of these compounds were tested. Compound 1, 3 and 4 showed antibacterial activity against Staphylococcus aureus with MIC values of 50, 100, 25 µg/mL, respectively.

Keywords: *Buttercup* family; *Thalictrum* genus; *Thalictrum microgynum Lecoy.ex Oliv*; Benzophenanthridine alkaloid.

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	1		2	
Position	$\delta_{\rm H} (J \text{ in Hz})$	$\delta_{ m C}$	$\delta_{\rm H} \left(J \text{ in Hz} \right)$	$\delta_{ m C}$
1	7.17 s	107.3	7.15 s	106. 7
2		149.6		149.6
3		148.5		148.1
4	7.54 s	105.4	7.45 s	105.3
4a		120.1		119.7
4b		135.0		134.4
6		162.9		162.9
6a		111.0		111.8
7		147.8		147.8
8		147.8		141.8
9	7.25 d (8.3)	113.4		152.8
10	7.78 d (8.6)	115.5	6.98 s	100.1
10a		129.2		117.0
10b		117.0		117.9
11	8.00 d (8.8)	118.8	9.03 d (9.0)	123.0
12	7.57 d (8.7)	123.1	7.53 d (9.0)	122.2
12a		130.8		130.1
OCH2O	6.27 s	103.0	6.22 s	102.7
2-OMe	4.04 s	56.1	4.04 s	56.1
3-OMe	4.03 s	56.1	4.02 s	56.1
5-NMe	3.97 s	40.8	3.91 s	41.2
9-OMe			4.01 s	57.2

Table S1. The ¹H-NMR (400 MHz) and ¹³C NMR (100 MHz) data of compound 1 and 2 in CDCl₃.

Figure S2. $^{1}H^{-1}H$ COSY (bold), selected HMBC correlations of 1 and 2



Figure S3. Selected NOESY correlations of 1 and 2



Figure S4. UV spectrum of compound 1



Figure S5. IR spectrum of compound 1





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Figure S7. ¹H-NMR spectrum of compound 1 (400MHz, CDCl₃)

Figure S8. ¹³C-NMR spectrum of compound 1 (100MHz, CDCl₃)



Figure S9. HSQC spectrum of compound 1



Figure S10. HMBC spectrum of compound 1



Figure S11. $^{1}H-^{1}H$ COSY spectrum of compound 1



Figure S12. NOESY spectrum of compound 1



Figure S13. UV spectrum of compound 2



Figure S14. IR spectrum of compound 2



Figure S15. HRESIMS spectrum of compound 2



<9.045 9.022 7 451 7 451 7 451 7 451 4.038 4.024 3.909 -6.219 3.39 Ì 18 13 4 2.21-1 4.0 5.5 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.0 4.5 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0

Figure S16. ¹H-NMR spectrum of compound 2 (400MHz, CDCl₃)



Figure S17. ¹³C-NMR spectrum of compound 1 (100MHz, CDCl₃)

Figure S18. HSQC spectrum of compound 2



Figure S19. HMBC spectrum of compound 2



Figure S20. ¹H–¹H COSY spectrum of compound 2



Figure S21. NOESY spectrum of compound 2

