SUPPLEMENTARY MATERIAL

A new coumarin from the roots of *Micromelum minutum*

Ratsami Lekphrom,* Kwanjai Kanokmedhakul, Watchara Sangsopa and Somdej Kanokmedhakul

*Natural Products Research Unit, Department of Chemistry, and Center for Innovation in Chemistry, Faculty of Science, Khon Kaen University, Khon Kaen 40002, Thailand*

Abstract

A new coumarin, minutuminolate (1) together with eleven known coumarins (2-12), were isolated from the roots of *Micromelum minutum*. The structures of these compounds were established on the basis of their 1D and 2D NMR spectroscopic data. Compounds 2, 5, 10, 11 and 12 showed cytotoxicity against KB cell line. In addition compounds 2, 3, 4, 7, 11 and 12 also showed weak cytotoxicity against NCI-H187 cell line.

Key words: *Micromelum minutum*; Rutaceae; coumarin; cytotoxicity

*Correspondence author

E-mail address: Ratsami@kku.ac.th
Content

Table S1. $^1$H and $^{13}$C NMR spectroscopic data of 1 (400 MHz, CDCl$_3$) ..................... 3

Figure S1. COSY (bold line) and Selected HMBC (H/C) correlations for 1 .............. 3

Figure S2. Mass spectrum of 1 .......................................................................................... 4
Figure S3. IR spectrum of 1 .............................................................................................. 5
Figure S4. $^1$H NMR spectrum of 1 recorded in CDCl$_3$ at 400 MHz ......................... 6
Figure S5. $^{13}$C NMR spectrum of 1 recorded in CDCl$_3$ at 100 MHz .......................... 7
Figure S6. DEPT spectrum of 1 recorded in CDCl$_3$ ....................................................... 8
Figure S7. HMQC spectrum of 1 recorded in CDCl$_3$. ................................................... 9
Figure S8. COSY spectrum of 1 recorded in CDCl$_3$. ..................................................... 10
Figure S9. HMBC spectrum of 1 recorded in CDCl$_3$. .................................................... 11
Figure S10. NOESY spectrum of 1 recorded in CDCl$_3$. .................................................. 12
Table S1. $^1$H and $^{13}$C NMR spectroscopic data of 1 (400 MHz, CDCl$_3$)

| No. | $\delta^H$ ($J$ in Hz) | $\delta^C$ |
|-----|------------------------|------------|
| 2   |                        | 159.8      |
| 3   | 6.25, d (9.4)          | 114.2      |
| 4   | 7.62, d (9.4)          | 142.8      |
| 5   | 7.44, d (8.6)          | 129.6      |
| 6   | 6.85, d (8.6)          | 108.0      |
| 7   |                        | 159.6      |
| 8   |                        | 117.8      |
| 9   |                        | 151.6      |
| 10  |                        | 112.6      |
| 1'  |                        | 186.4      |
| 2'  |                        | 140.7      |
| 3'  |                        | 142.7      |
| 4'  | 1.82, s                | 21.6       |
| 5'  | 2.27, s                | 20.4       |
| 1"  |                        | 170.7      |
| 2"  | 1.92, d (6.8)          | 42.4       |
| 3"  | 1.77, m                | 25.1       |
| 4"  | 0.72, d (6.8)          | 22.2       |
| 5"  | 0.72, d (6.8)          | 22.2       |
| 7-OMe |            | 3.86, s    |
|      |                        | 56.5       |

Figure S1. COSY (bold line) and Selected HMBC (H/C) correlations for 1.
Figure S2. Mass spectrum of 1
Figure S3. IR spectrum of 1
Figure S4. $^1$H NMR spectrum of 1 recorded in CDCl$_3$ at 400 MHz.
Figure S5. $^{13}$C NMR spectrum of 1 recorded in CDCl$_3$ at 100 MHz.
Figure S6. DEPT spectrum of 1 recorded in CDCl$_3$. 
Figure S7. HMQC spectrum of 1 recorded in CDCl$_3$. 
Figure S8. COSY spectrum of 1 recorded in CDCl$_3$. 
Figure S9. HMBC spectrum of 1 recorded in CDCl$_3$. 
Figure S10. NOESY spectrum of 1 recorded in CDCl$_3$. 