



NOTE

Another New Alkaloid from *Corydalis impatiens*

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A new alkaloid, named impatien B (**1**) was isolated from the roots of *Corydalis impatiens* (Pall.) Fisch. The structure of the new compounds was established on the basis of spectroscopic data analysis, especially of their 2D NMR spectra.

Key Words: *Corydalis impatiens*, Isoindole alkaloids.

Corydalis impatiens (Pall.) Fisch grows in south China and is an important component in various prescriptions in traditional Chinese medicine¹. The *Corydalis* plant has been demonstrated to possess many pharmacological activities, including antibacterial, antiviral and anticancer activities². To the best of our knowledge, no study on the chemical constituents of the *C. impatiens* has *hitherto* been reported. As part of our studies of medicinal plants growing on the Yunnan Plateau, we did a careful phytochemical investigation on the roots of this plant. As a result, a new alkaloids was isolated and identified as impatien B (**1**).

The roots of *C. impatiens* were collected from Diqing area, Yunnan Province, China, in October 2005 and identified by Prof. Gan-Peng Li in Yunnan University of Nationalities. A voucher specimen was deposited in our laboratory of school of chemistry and biotechnology.

Extraction and isolation: The air-dried plant materials (14 Kg) were ground, and extracted with 70 % EtOH under reflux. The filtered extract was combined and concentrated in vacuum at 40 °C to yield EtOH extract (750 g). The extract was dissolved in 2 % hydrochloric acid. The filtrated HCl aqueous solution was defatted with ether and basified to pH = 10 with 10 % aqueous ammonia and was extracted with chloroform to give total alkaloids (300 g). The chloroform soluble extract (30 g) was repeated CC and Sephadex LH-20 to provide impatien B (**1**) (30 mg).

Compound **1** was determined to have the molecular formula C₂₁H₁₉NO₆ based on high resolution HRESIMS (m/z 382.1291 [M+1]⁺, calcd 382.1290), yellow needles, m.p. 162-

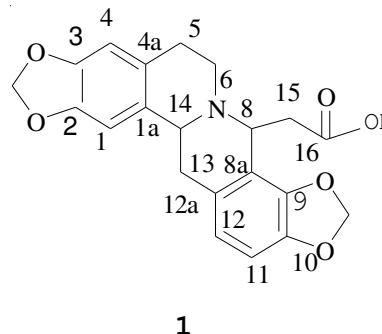


Fig. 1. Structures of compound **1**

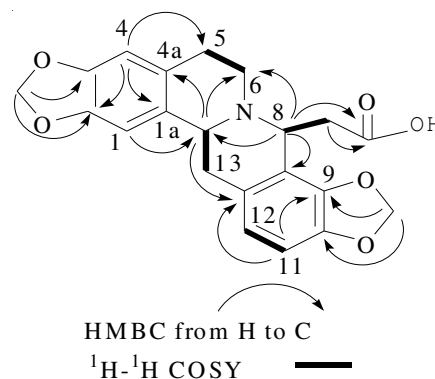


Fig. 2. Key HMBC and ¹H-¹H COSY correlations of compound **1**

163 °C. The UV spectrum of **1** showed absorption maxima at 264 (2.6) nm and the inspection of the NMR data revealed an protoberberine-type alkaloids³⁻⁵. The ¹³CNMR and DEPT

TABLE-1
NMR (300 Hz) DATA OF COMPOUND **1** (CDCl₃, δ ppm, J IN Hz)

Compd. No.	δ_H	δ_C
1	6.74 (1H,s)	107.6 (d)
1a		129.0 (s)
2		148.1 (s)
3		149.1 (s)
4	6.67 (1H,s)	109.5 (d)
4a		125.3 (s)
5	2.98 (2H, d, $J = 5.0$)	28.1 (t)
6	3.15 (2H, d, $J = 5.0$)	45.7 (t)
8	4.70 (1H, t, $J = 5.0, J = 15.9$)	59.1 (d)
8a		115.3 (s)
9		145.3 (s)
10		147.5 (s)
11	6.78 (1H, d, $J = 8.0$)	109.6 (d)
12	6.70 (1H, d, $J = 8.0$)	122.9 (d)
12a		125.7 (s)
13	3.34 (2H, d, $J = 6.6$)	32.2 (t)
14	3.54 (1H, d, $J = 6.6$)	52.0 (d)
15	2.79 (2H, t, $J = 5.0, J = 15.9$)	36.7 (t)
16		176.9 (s)
-OCH ₂ O-	6.00 (2H, d)	102.6 (t)
-OCH ₂ O-	5.91 (2H, d)	103.2 (t)

(Table-1) spectra of compound **1** showed twenty-one carbon signals including five methylene, six methine and nine quaternary carbons. The ¹³CNMR signal at δ_C 176.9 (s) revealed a carboxyl. The HMBC correlations from δ_H 2.79 (H-15) to δ_C 176.9 (C-16), δ_C 59.1 (C-8) and from δ_H 4.70 (H-8) to δ_C 115.3 (C-8a), δ_C 45.7 (C-6), δ_C 36.7 (C-15), δ_C 176.9 (C-16) indicated an carboxyl at C-8, which also was supported by its IR

data (1718 cm⁻¹). There are four spin-spin systems (Fig. 2) of **1** established by COSY correlations, the first spin-spin system by two protons at δ_H 2.98 (2H, d, $J = 5.0$ Hz, H-5) and δ_H 3.15 (2H, d, $J = 5.0$ Hz, H-6), the second spin-spin system by other two protons at δ_H 4.70 (1H, t, $J = 5.0, 15.9$ Hz, H-8) and δ_H 2.79 (2H, t, $J = 5.0, 15.9$ Hz, H-15), the third spin-spin system by other two protons at δ_H 3.34 (2H, d, $J = 6.6$ Hz, H-13) and δ_H 3.54 (1H, d, $J = 6.6$ Hz, H-14) and the fourth spin-spin system by two aromatic protons at δ_H 6.78 (1H, d, $J = 8.0$ Hz, H-11) and δ_H 6.70 (1H, d, $J = 8.0$ Hz, H-12). Based on those analyses, the structure of **1** (Fig. 1) was identified as impatien B.

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REFERENCES

1. Z.Y. Wu, D.J. Yu and R. Lin, *Flora Republicae Popularis Sinicae*, **32**, 344 (2004).
2. J.C. Li, X.H. Dong and J.W. Deng, *J. Chin. Med. Mater.*, **33**, 210 (2010).
3. A. Patra, C.T. Montgomery, A.J. Freyer, H. Guinaudeau, M. Shamma, B. Tantisewie and K. Pharadai *Phytochemistry*, **26**, 547 (1987).
4. P.M.M. Pinho, M.M.M. Pinto, A. Kijjoo, K. Pharadai, J.G. Díaz and W. Herz, *Phytochemistry*, **31**, 1403 (1992).
5. L. Grycová, J. Dostal and R. Marek, *Phytochemistry*, **68**, 150 (2007).