

Supporting Information

Bioactive Bis-naphtho- γ -pyrones from Rice False Smut Pathogen *Ustilaginoidea virens*

Shiqiong Lu,[†] Weibo Sun,[†] Jiajia Meng,[†] Ali Wang,[†] Xiaohan Wang,[†] Jin Tian,[†] Xiaoxiang Fu,[†] Jungui Dai,[‡] Yang Liu,[§] Daowan Lai,^{**†} and Ligang Zhou^{*†}

[†]MOA Key Laboratory of Plant Pathology, Department of Plant Pathology, College of Agronomy and Biotechnology, China Agricultural University, Beijing 100193, China

[‡]State Key Laboratory of Bioactive Substance and Function of Natural Medicines, Institute of Materia Medica, Chinese Academy of Medical Science & Peking Union Medical College, Beijing 100050, China

[§]Institute of Agro-products Processing Science and Technology, Chinese Academy of Agricultural Sciences, Beijing 100193, China

*Corresponding author

Tel: +86 10 62731199; Fax: +86 10 62731062; E-mail: lgzhou@cau.edu.cn

** Additional Corresponding Author

Tel: +86 10 62733609; Fax: +86 10 62733530; E-mail: dwlai@cau.edu.cn

Contents

Figure 1S. IR spectrum of ustilaginoidin K (1).....	S3
Figure 2S. ¹ H NMR spectrum of ustilaginoidin K (1) (CD ₃ COCD ₃ , 600 MHz).....	S4
Figure 3S. ¹³ C NMR spectrum of ustilaginoidin K (1) (CD ₃ COCD ₃ , 150 MHz)	S4
Figure 4S. HSQC spectrum of ustilaginoidin K (1)	S5
Figure 5S. HMBC spectrum of ustilaginoidin K (1)	S5
Figure 6S. HRESIMS spectrum of ustilaginoidin K (1).....	S6
Figure 7S. CD spectrum of ustilaginoidin K (1) (DSMO)	S6
Figure 8S. IR spectrum of ustilaginoidin L (2)	S7
Figure 9S. ¹ H NMR spectrum of ustilaginoidin L (2) (CD ₃ COCD ₃ , 600 MHz)	S8
Figure 10S. ¹³ C NMR spectrum of ustilaginoidin L (2) (CD ₃ COCD ₃ , 100 MHz)	S8
Figure 11S. HMQC spectrum of ustilaginoidin L (2).....	S9
Figure 12S. HMBC spectrum of ustilaginoidin L (2).....	S9
Figure 13S. HRESIMS spectrum of ustilaginoidin L (2)	S10
Figure 14S. CD spectrum of ustilaginoidin L (2) (DSMO).....	S10
Figure 15S. IR spectrum of ustilaginoidin M (3)	S11
Figure 16S. ¹ H NMR spectrum of ustilaginoidin M (3) (CD ₃ COCD ₃ , 600 MHz).....	S12
Figure 17S. ¹³ C NMR spectrum of ustilaginoidin M (3) (CD ₃ COCD ₃ , 100 MHz).....	S12
Figure 18S. HRESIMS spectrum of ustilaginoidin M (3)	S13
Figure 19S. CD spectrum of ustilaginoidin M (3) (DSMO).....	S13
Figure 20S. IR spectrum of ustilaginoidin N (4).....	S14
Figure 21S. ¹ H NMR spectrum of ustilaginoidin N (4) (CD ₃ COCD ₃ , 400 MHz).....	S15
Figure 22S. ¹³ C NMR spectrum of ustilaginoidin N (4) (CD ₃ COCD ₃ , 100 MHz)	S15
Figure 23S. HMQC spectrum of ustilaginoidin N (4).....	S16
Figure 24S. HMBC spectrum of ustilaginoidin N (4)	S16
Figure 25S. HRESIMS spectrum of ustilaginoidin N (4).....	S17
Figure 26S. CD spectrum of ustilaginoidin N (4) (DSMO)	S17
Figure 27S. IR spectrum of ustilaginoidin O (5).....	S18
Figure 28S. ¹ H NMR spectrum of ustilaginoidin O (5) (CD ₃ COCD ₃ , 600 MHz).....	S19
Figure 29S. ¹³ C NMR spectrum of ustilaginoidin O (5) (CD ₃ COCD ₃ , 150 MHz)	S19
Figure 30S. HSQC spectrum of ustilaginoidin O (5)	S20
Figure 31S. HMBC spectrum of ustilaginoidin O (5)	S20
Figure 32S. HRESIMS spectrum of ustilaginoidin O (5).....	S21
Figure 33S. CD spectrum of ustilaginoidin O (5) (DMSO)	S21
Figure 34S. IR spectrum of ustilaginoidin P (6).....	S22
Figure 35S. ¹ H NMR spectrum of ustilaginoidin P (6) (CD ₃ COCD ₃ , 600 MHz)	S23
Figure 36S. ¹³ C NMR spectrum of ustilaginoidin P (6) (CD ₃ COCD ₃ , 150 MHz)	S23
Figure 37S. HRESIMS spectrum of ustilaginoidin P (6)	S24
Figure 38S. CD spectrum of ustilaginoidin P (6) (DMSO).....	S24
Figure 39S. IR spectrum of ustilaginoidin E ₁ (7)	S25
Figure 40S. ¹ H NMR spectrum of ustilaginoidin E ₁ (7) (CD ₃ COCD ₃ , 600 MHz).....	S26
Figure 41S. ¹³ C NMR spectrum of ustilaginoidin E ₁ (7) (CD ₃ COCD ₃ , 150 MHz).....	S26
Figure 42S. HRESIMS spectrum of ustilaginoidin E ₁ (7).....	S27
Figure 43S. CD spectrum of ustilaginoidin E ₁ (7) (DMSO)	S27

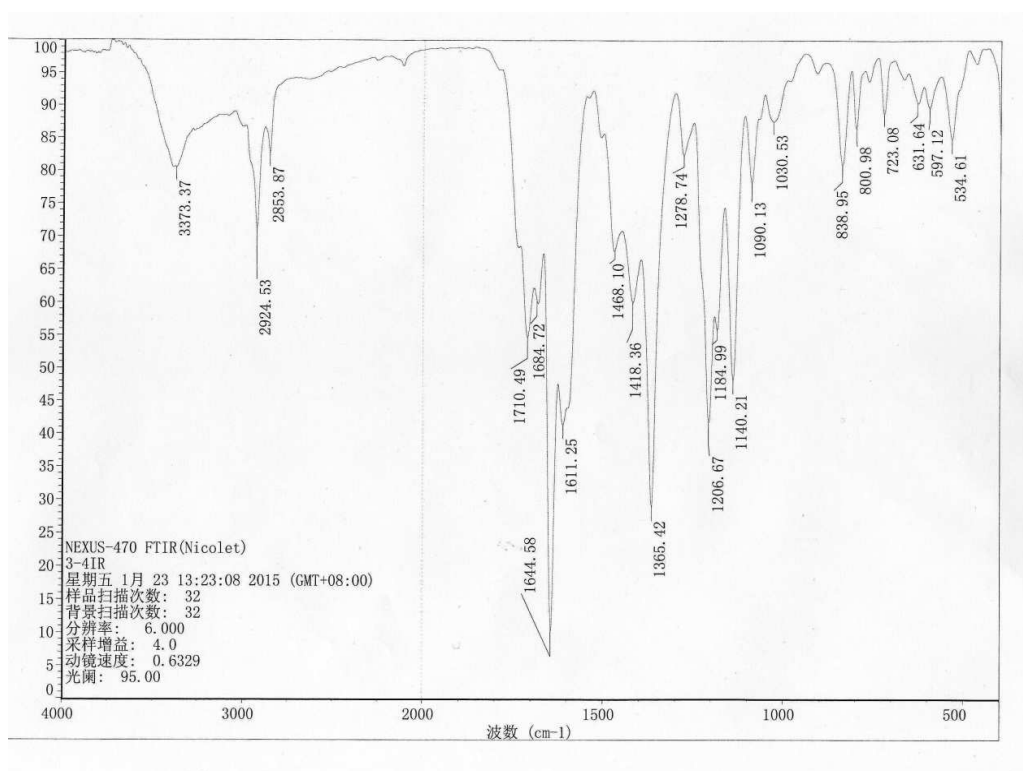
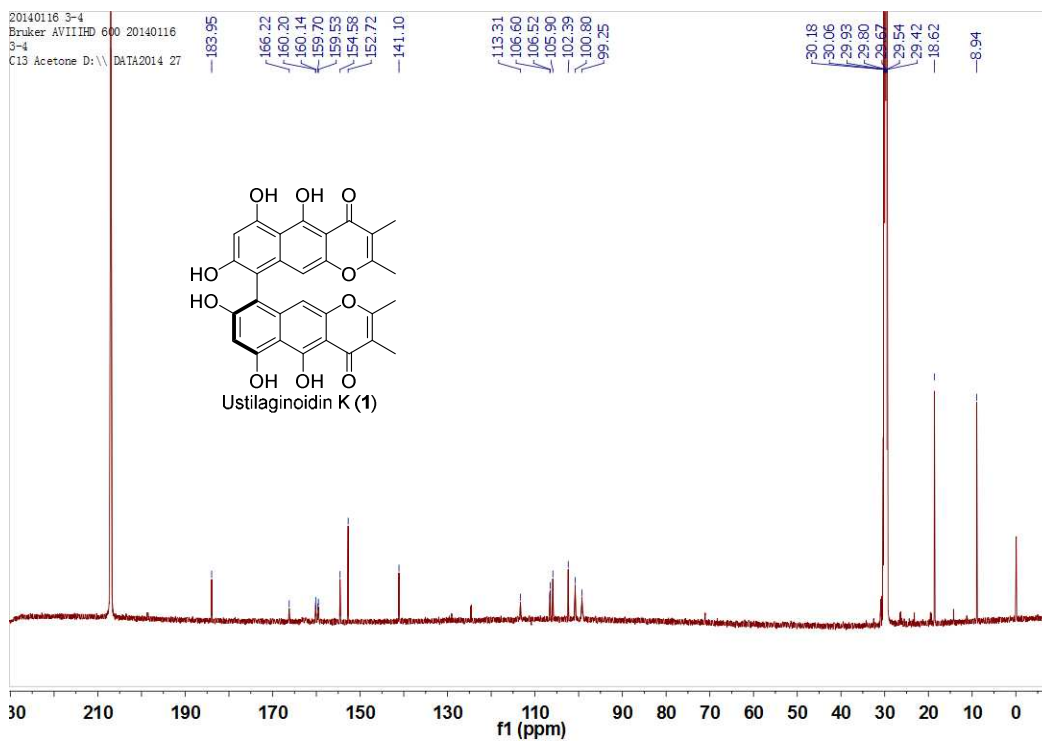
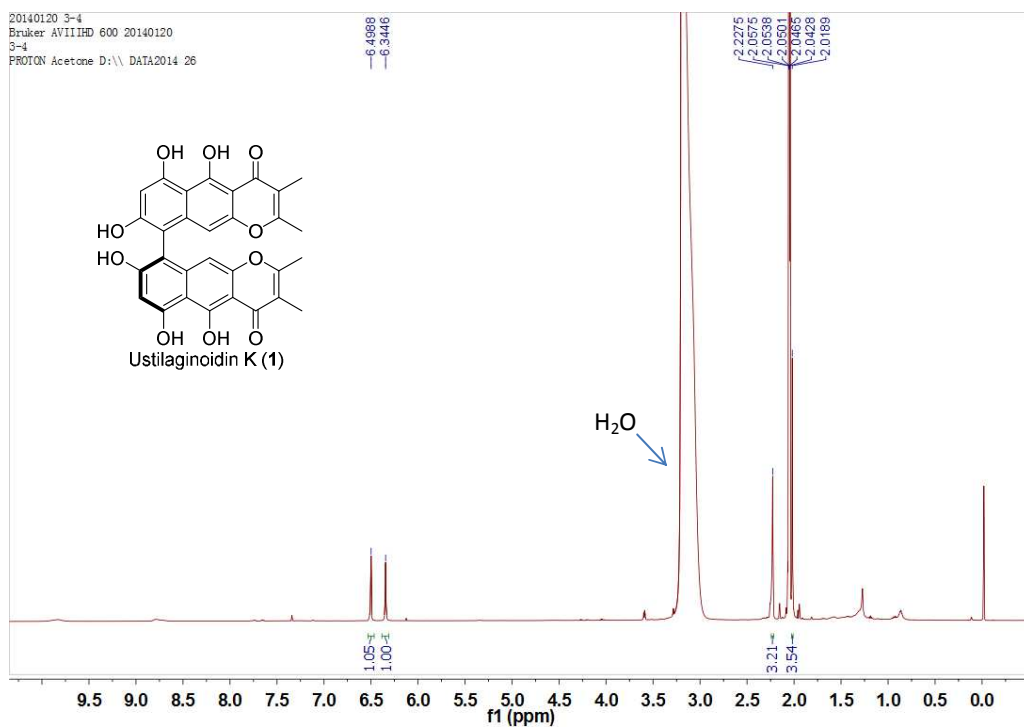


Figure 1S. IR spectrum of ustilaginoidin K (**1**)



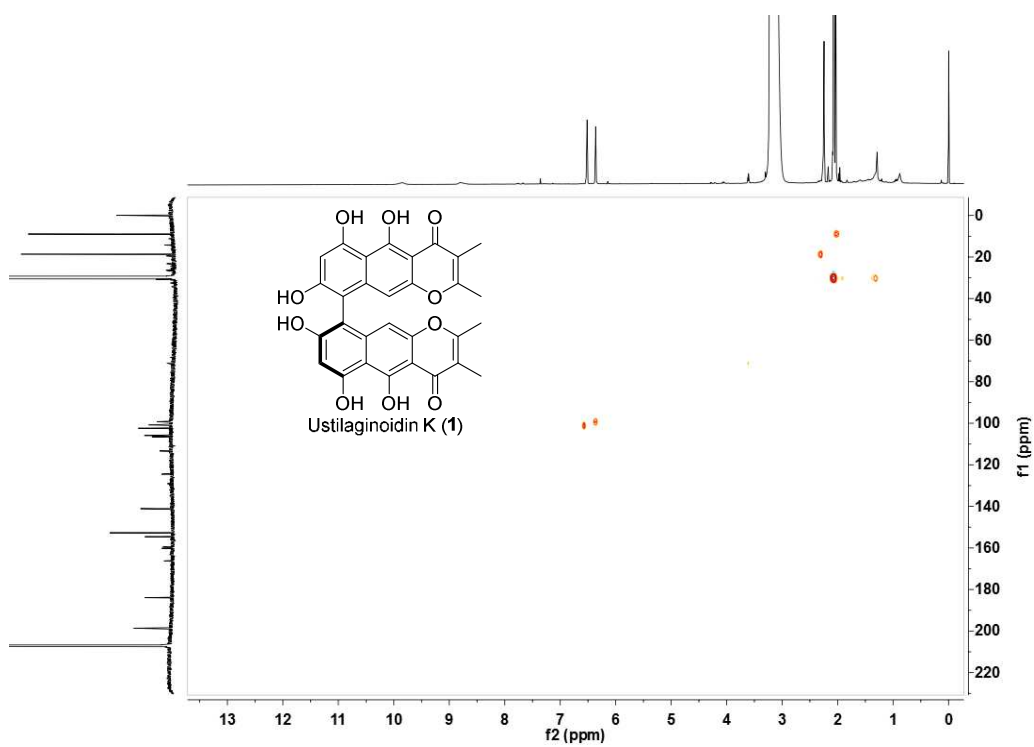


Figure 4S. HSQC spectrum of ustilaginoidin K (1)

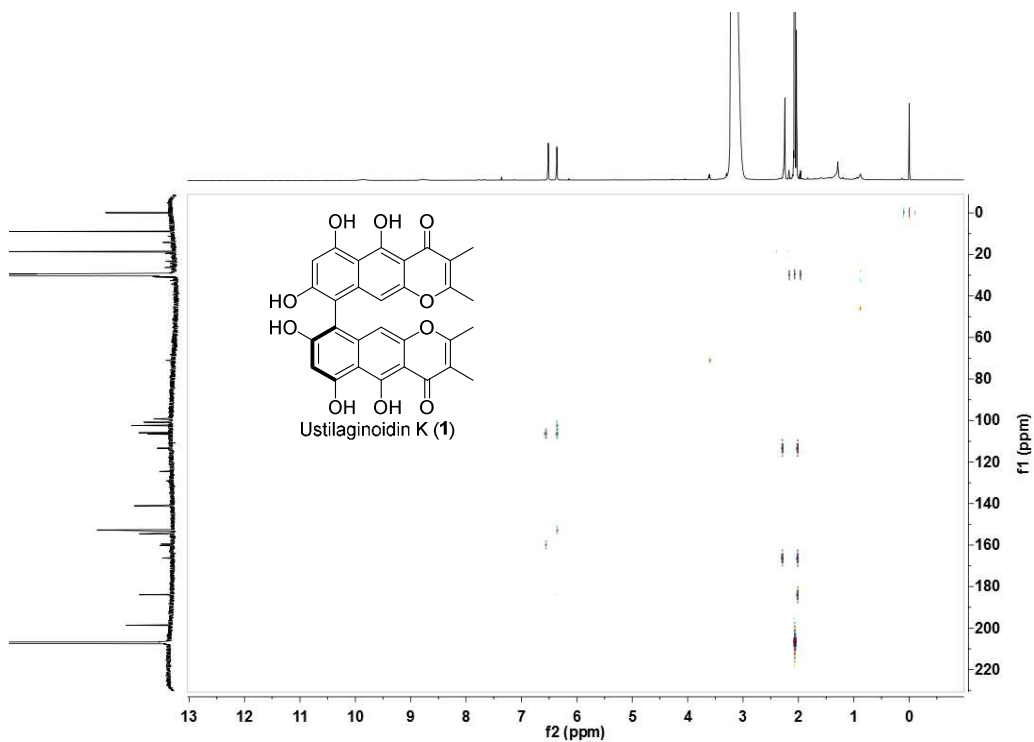


Figure 5S. HMBC spectrum of ustilaginoidin K (1)

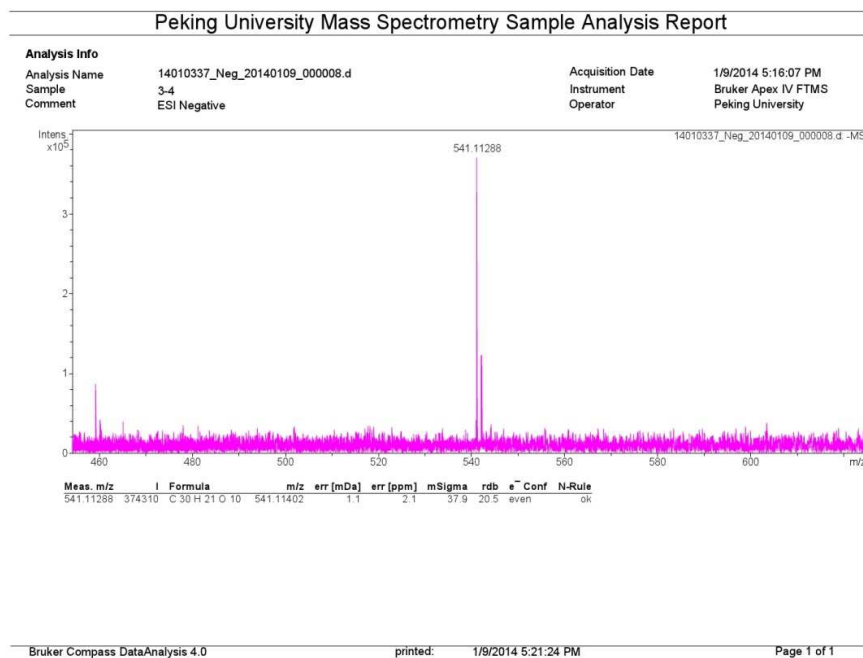


Figure 6S. HRESIMS spectrum of ustilaginoidein K (**1**)

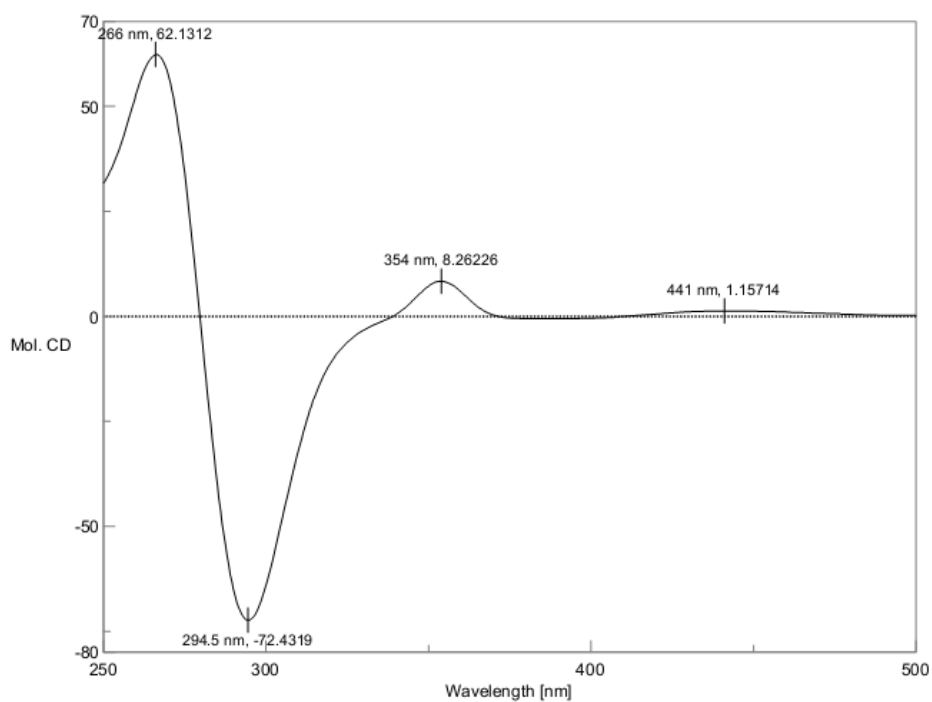


Figure 7S. CD spectrum of ustilaginoidein K (**1**) (DMSO)

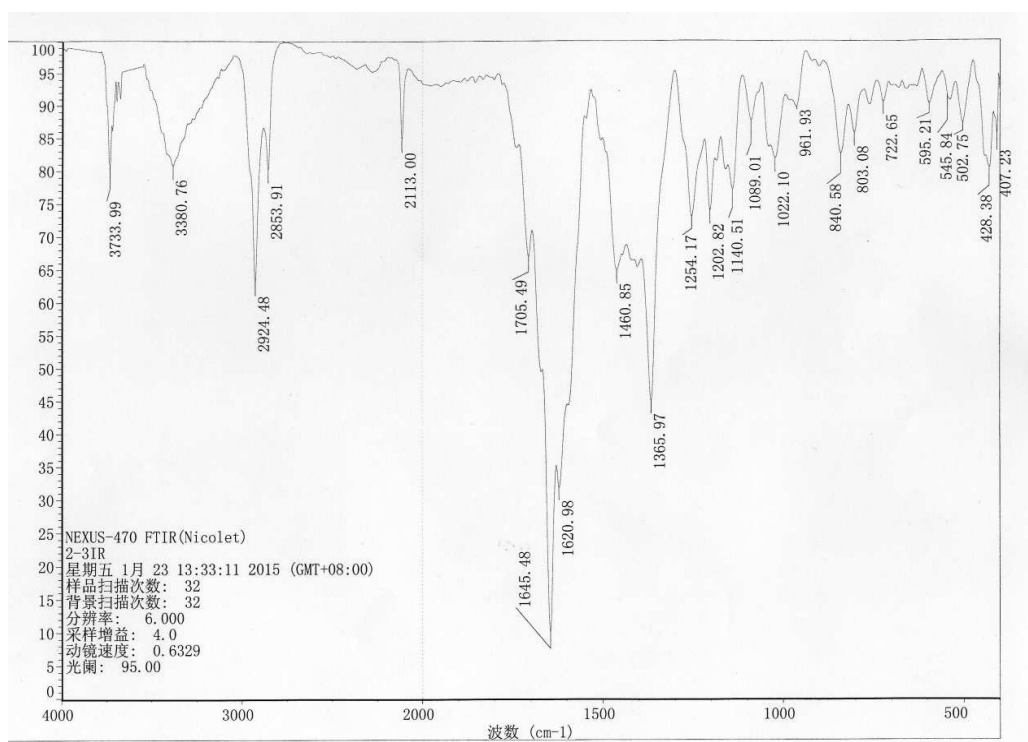


Figure 8S. IR spectrum of ustilaginoidin L (**2**)

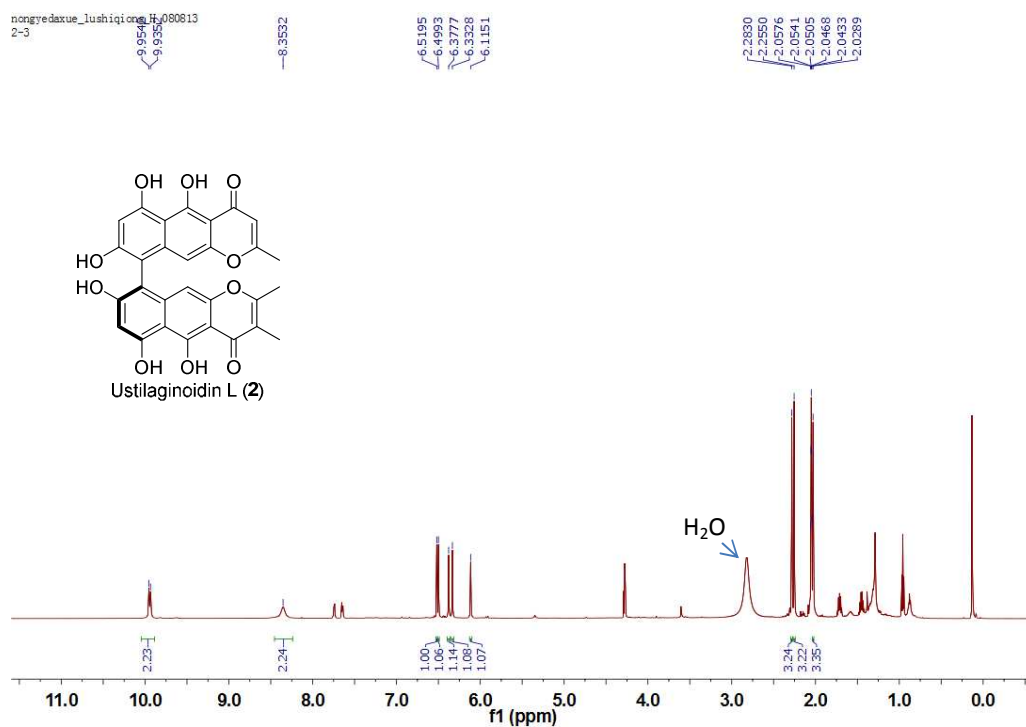


Figure 9S. ¹H NMR spectrum of ustilaginoidin L (2) (CD₃COCD₃, 600 MHz)

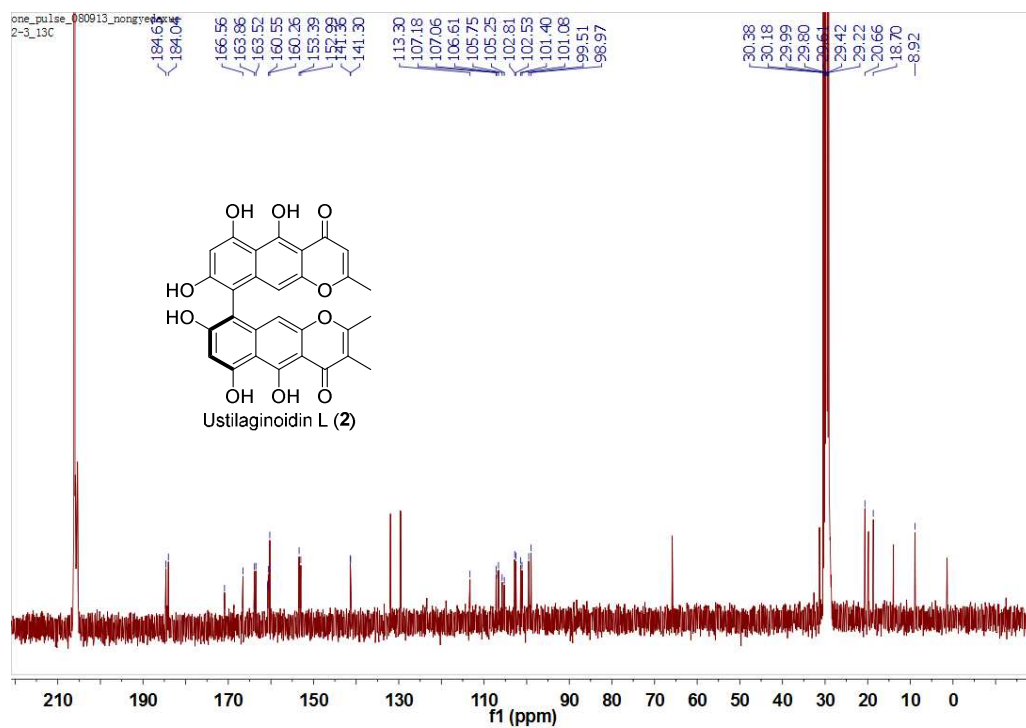


Figure 10S. ¹³C NMR spectrum of ustilaginoidin L (2) (CD₃COCD₃, 100 MHz)

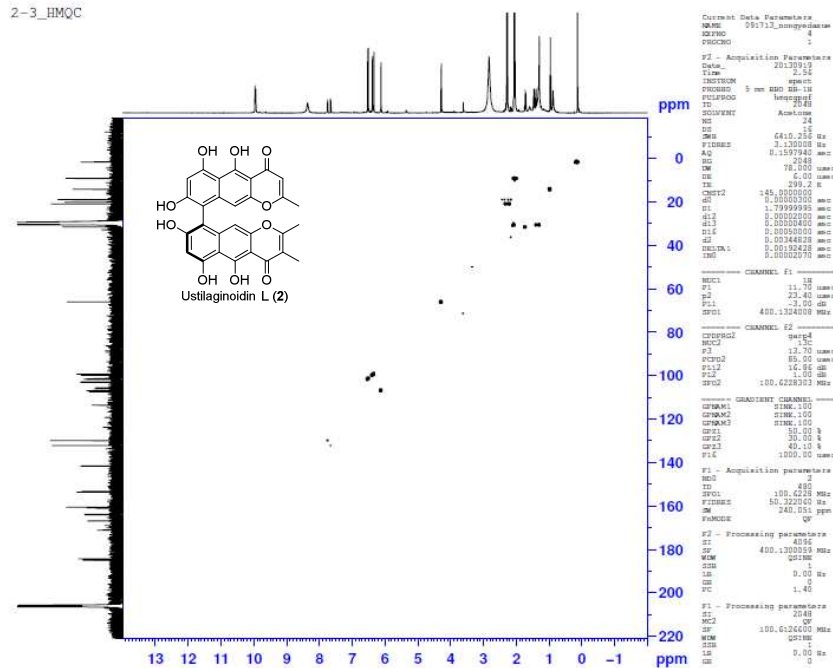


Figure 11S. HMQC spectrum of ustilaginoidin L (**2**)

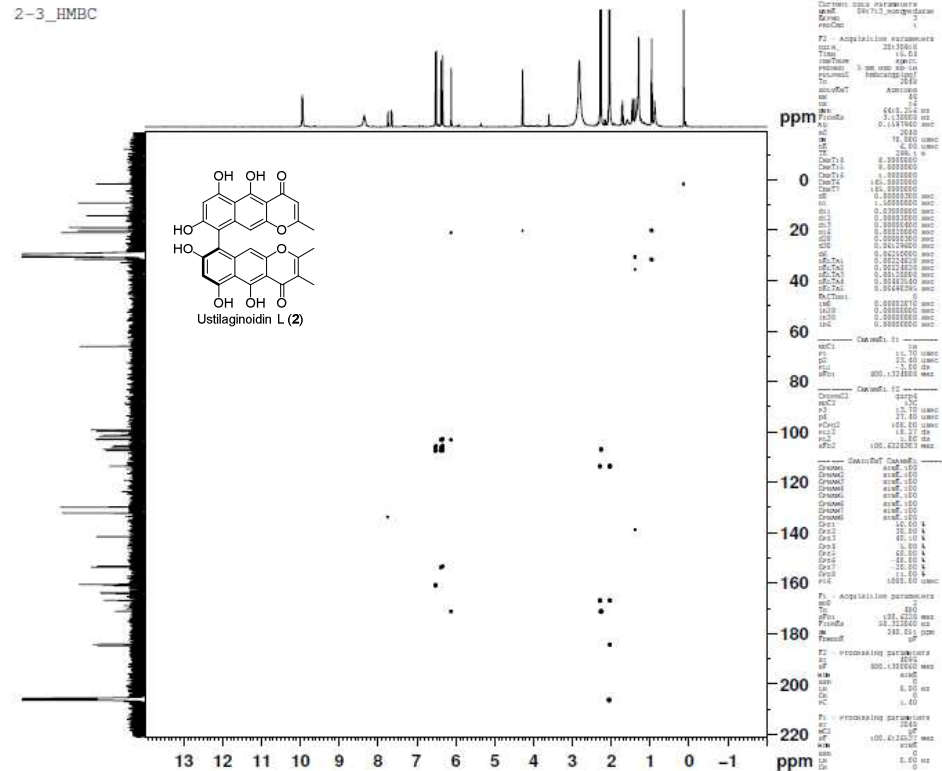


Figure 12S. HMBC spectrum of ustilaginoidin L (**2**)

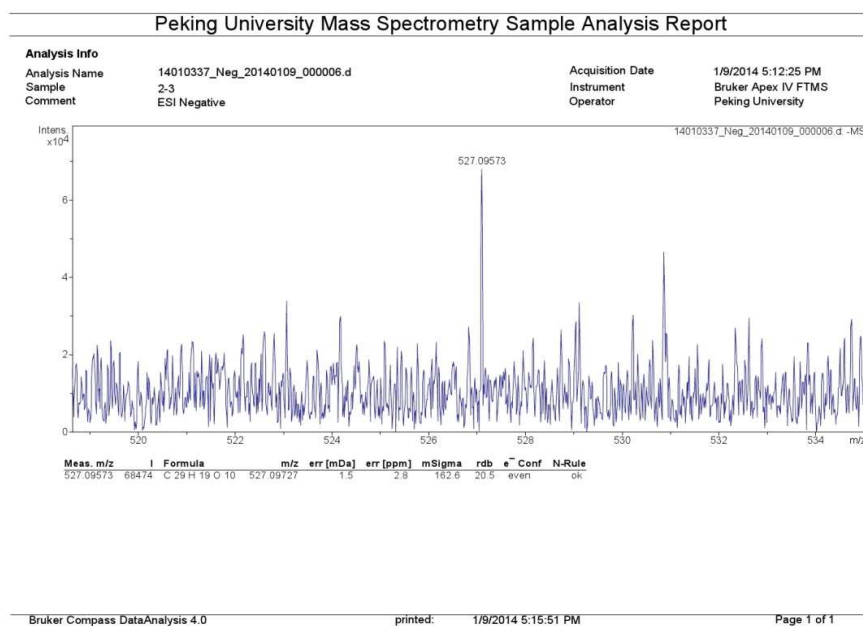


Figure 13S. HRESIMS spectrum of ustilaginoidin L (**2**)

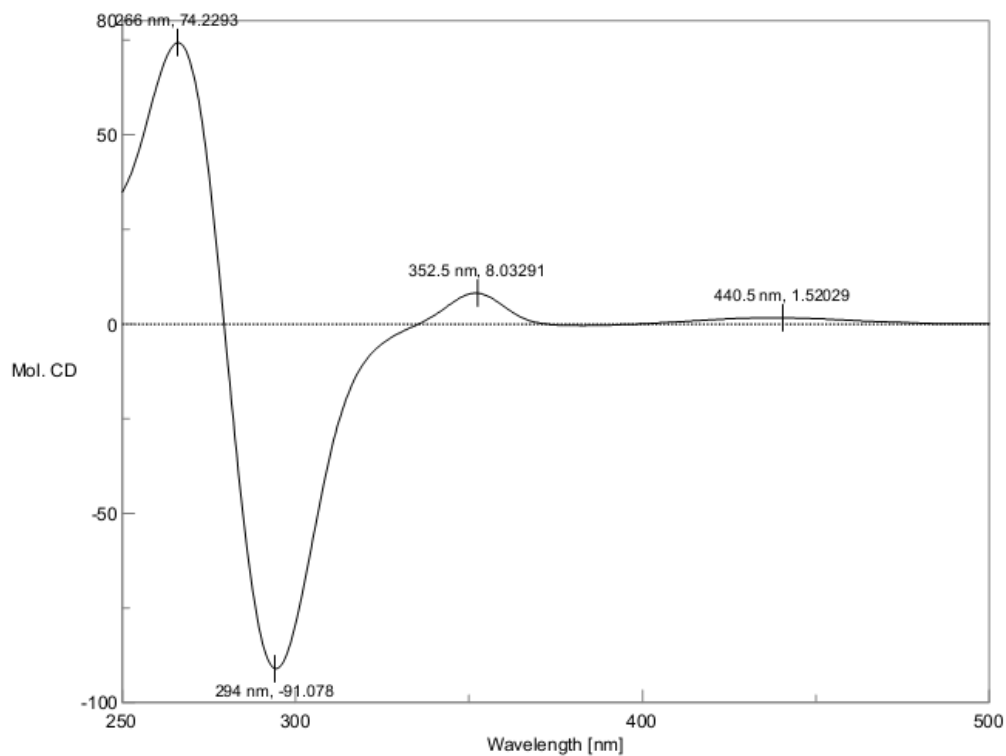


Figure 14S. CD spectrum of ustilaginoidin L (**2**) (DSMO)

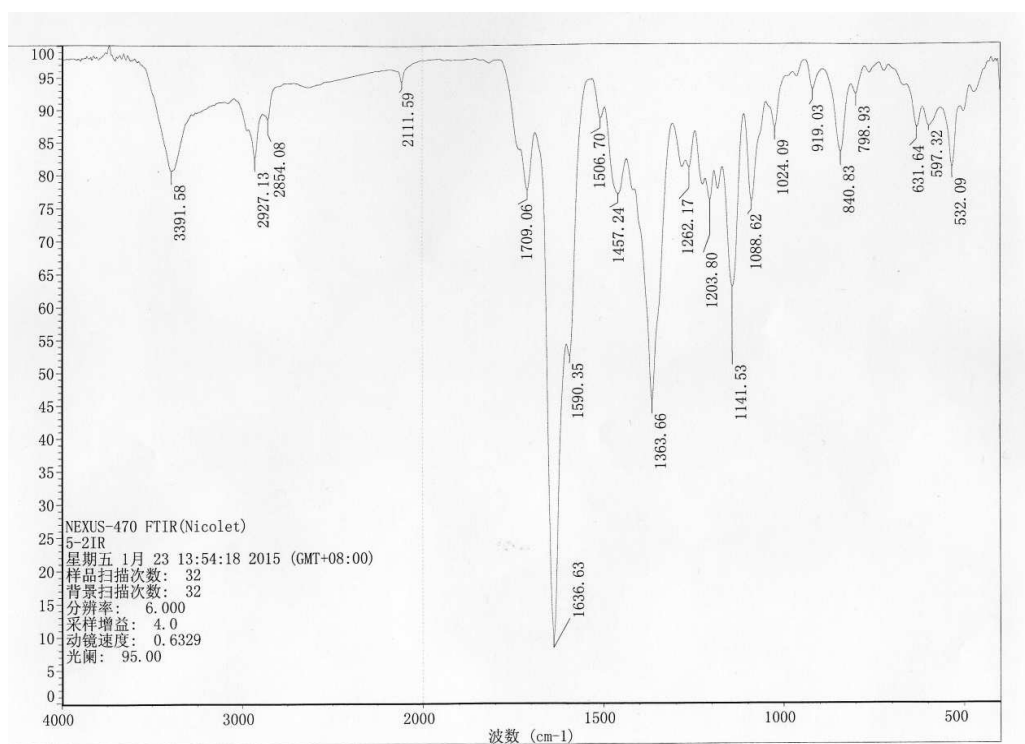


Figure 15S. IR spectrum of ustilaginoidin M (**3**)

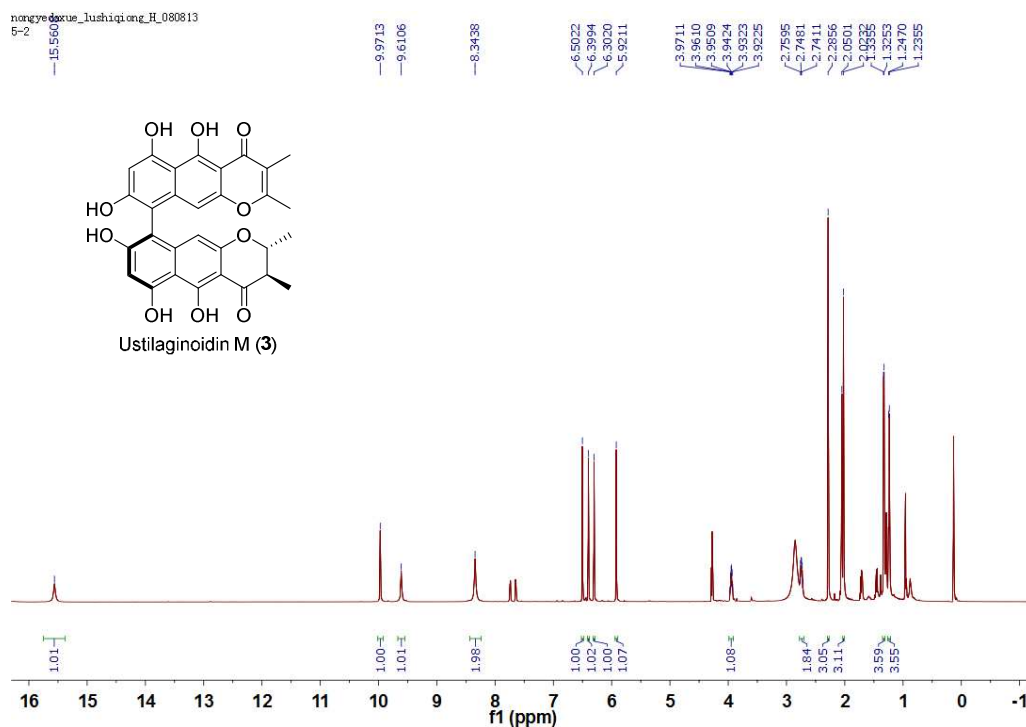


Figure 16S. ^1H NMR spectrum of ustilaginoidin M (3) (CD_3COCD_3 , 600 MHz)

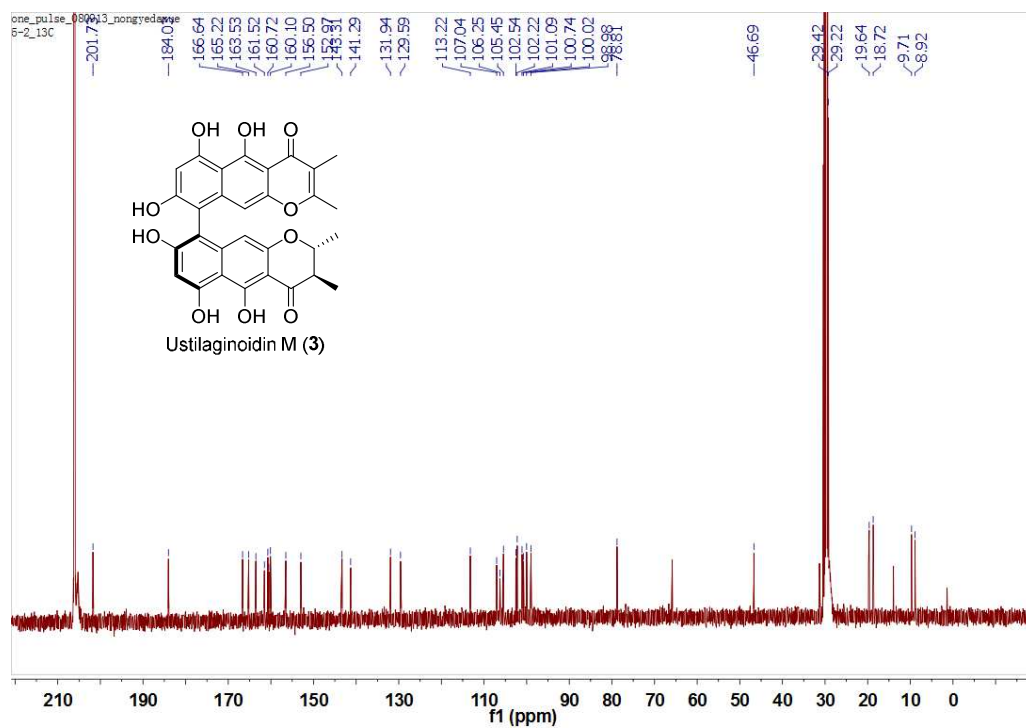


Figure 17S. ^{13}C NMR spectrum of ustilaginoidin M (3) (CD_3COCD_3 , 100 MHz)

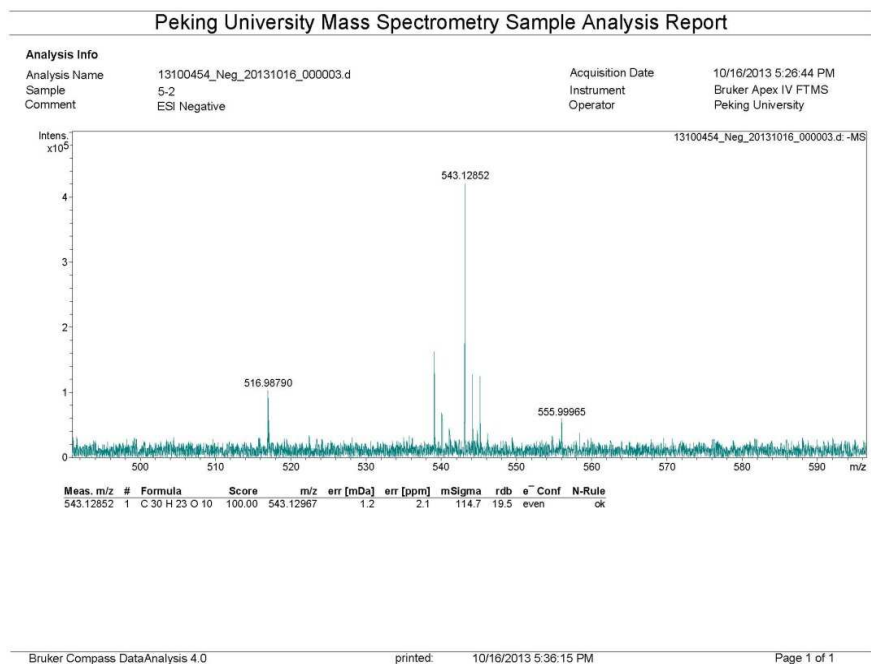


Figure 18S. HRESIMS spectrum of ustilaginoindin M (**3**)

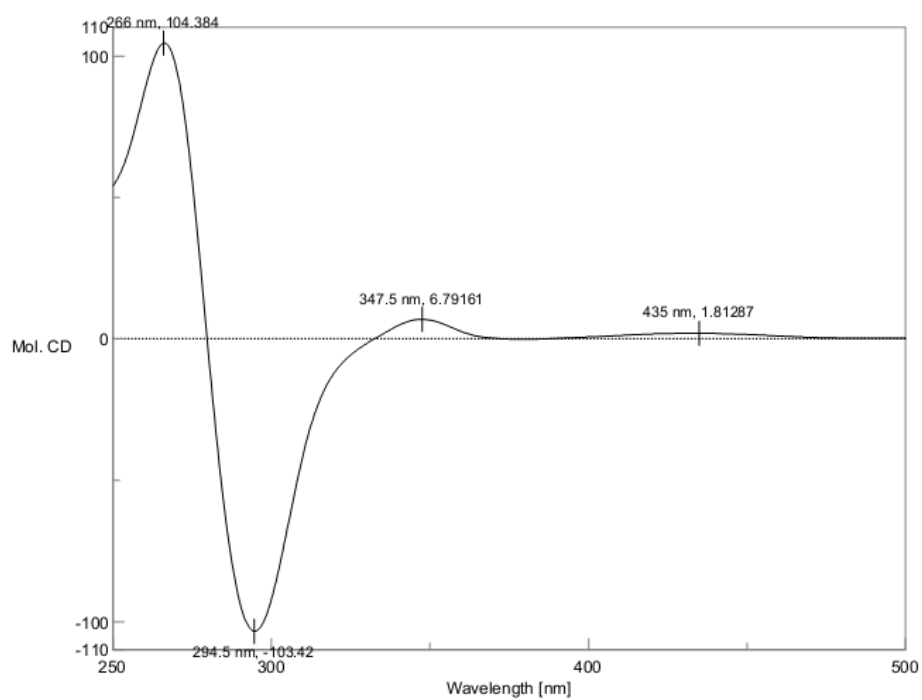


Figure 19S. CD spectrum of ustilaginoindin M (**3**) (DSMO)

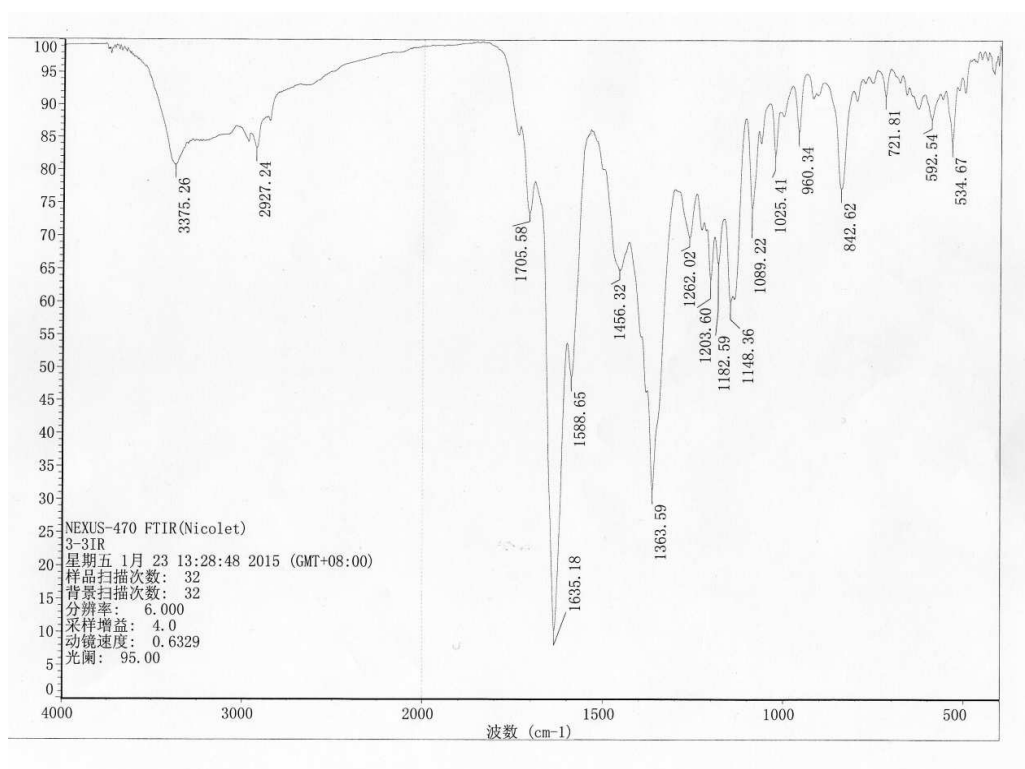


Figure 20S. IR spectrum of ustilaginoidin N (**4**)

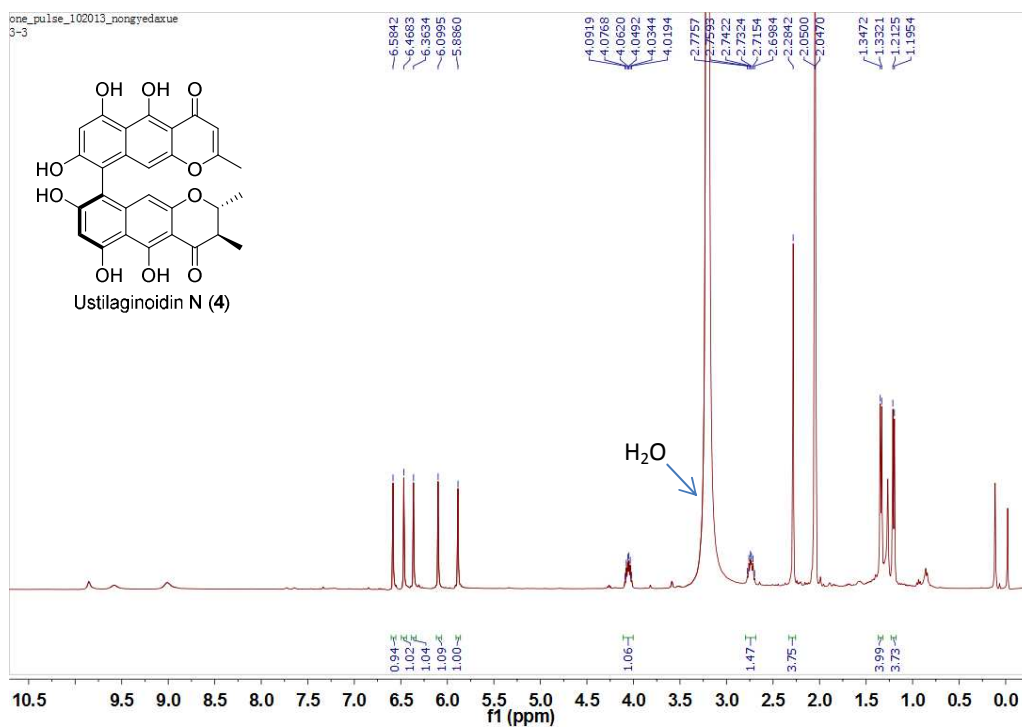


Figure 21S. ^1H NMR spectrum of ustilaginoidin N (4) (CD_3COCD_3 , 400 MHz)

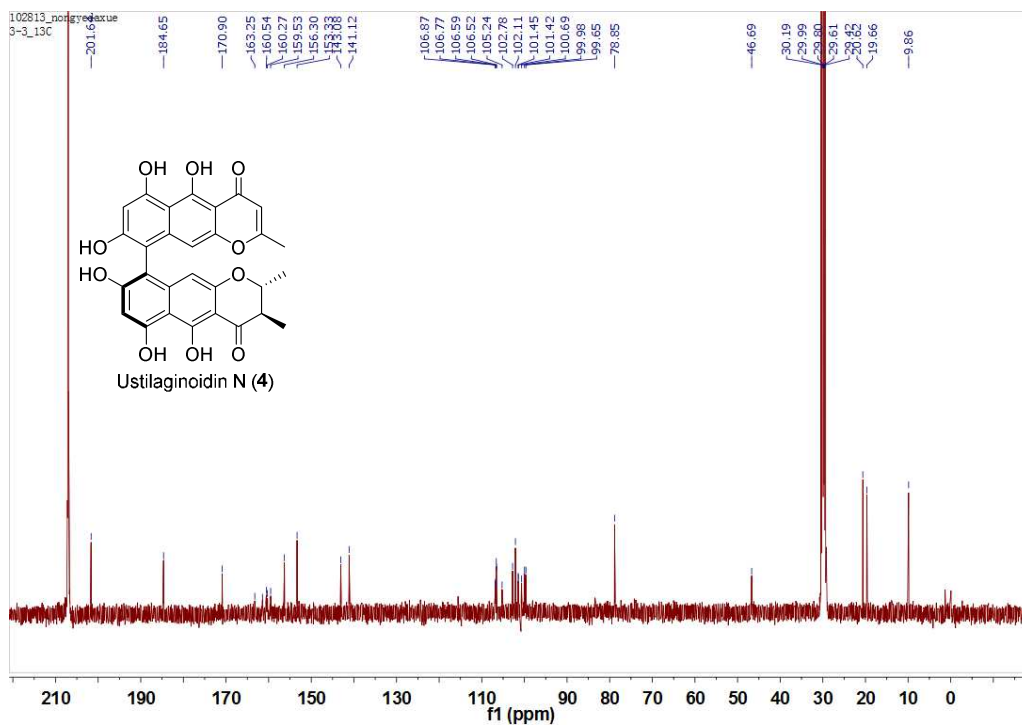
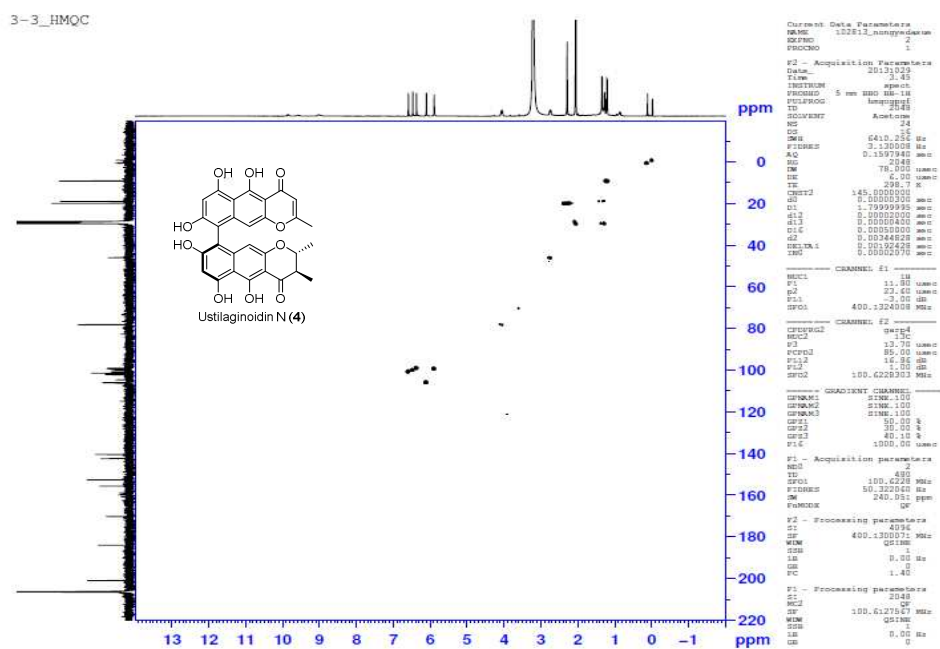


Figure 22S. ^{13}C NMR spectrum of ustilaginoidin N (4) (CD_3COCD_3 , 100 MHz)



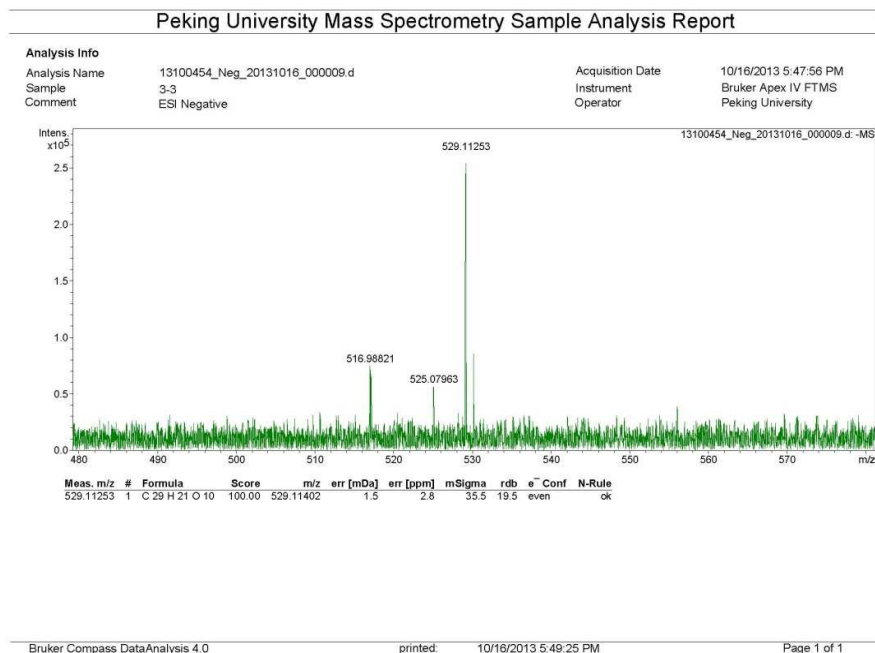


Figure 25S. HRESIMS spectrum of ustilaginoidin N (**4**)

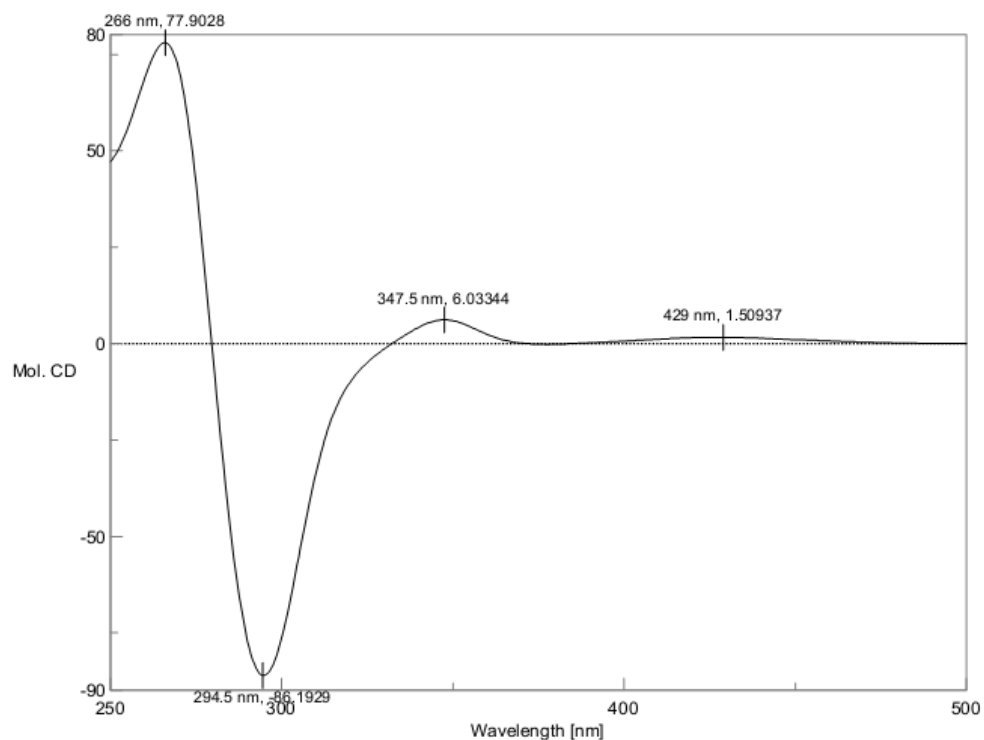


Figure 26S. CD spectrum of ustilaginoidin N (**4**) (DMSO)

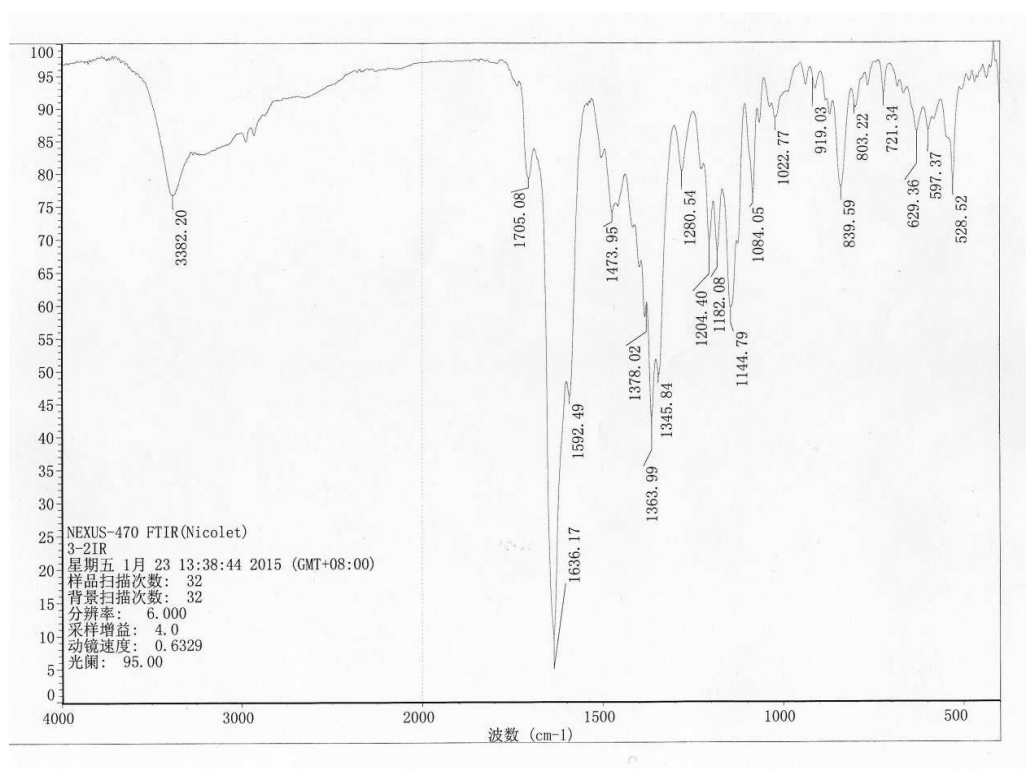


Figure 27S. IR spectrum of ustilaginoidin O (**5**)

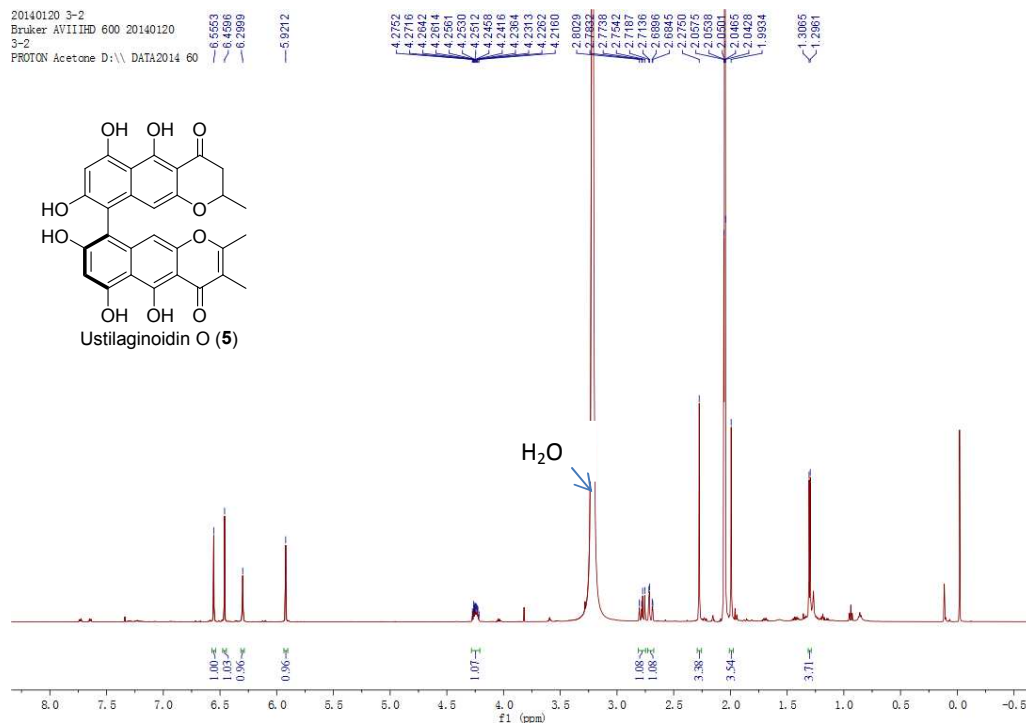


Figure 28S. ¹H NMR spectrum of ustilaginoidin O (5) (CD₃COCD₃, 600 MHz)

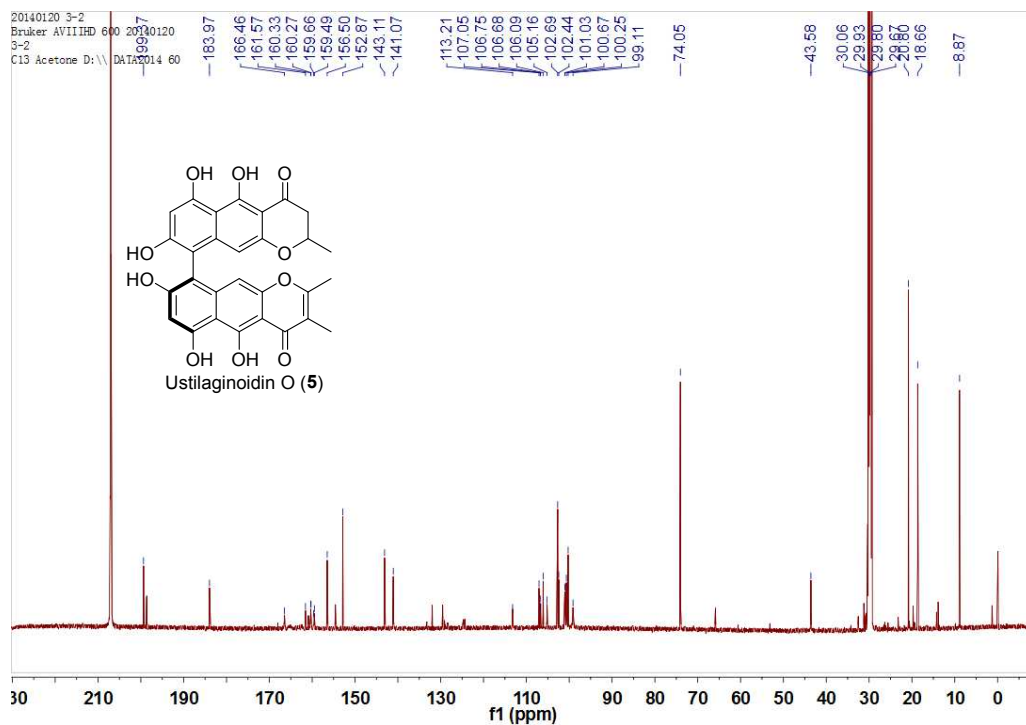


Figure 29S. ¹³C NMR spectrum of ustilaginoidin O (5) (CD₃COCD₃, 150 MHz)

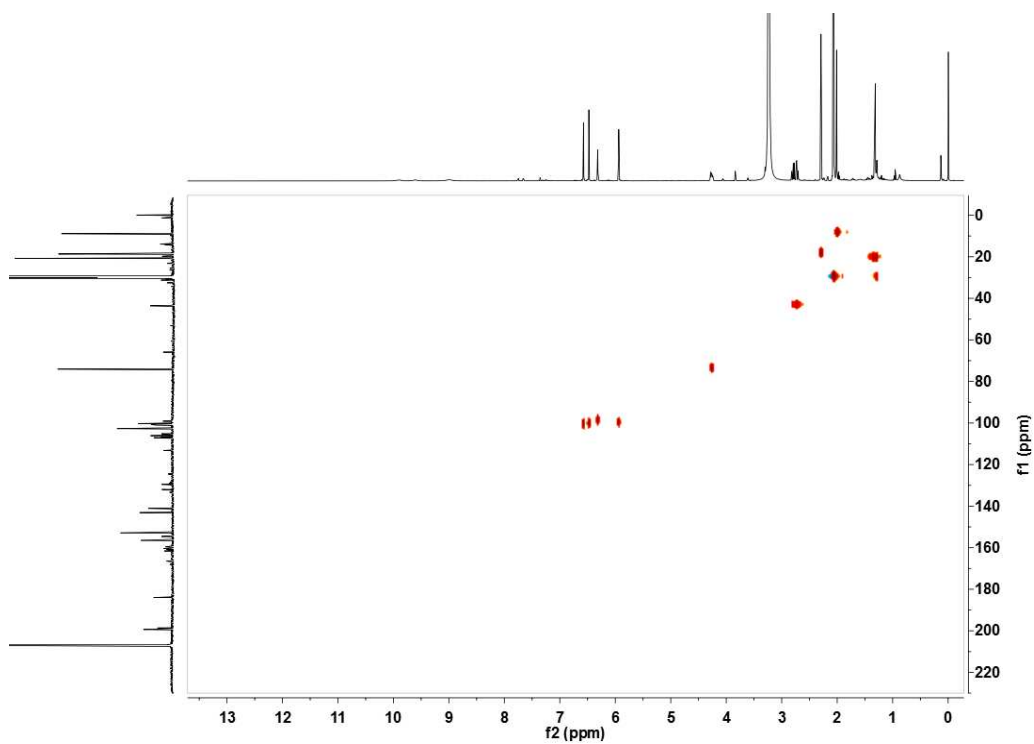


Figure 30S. HSQC spectrum of ustilaginoidin O (**5**)

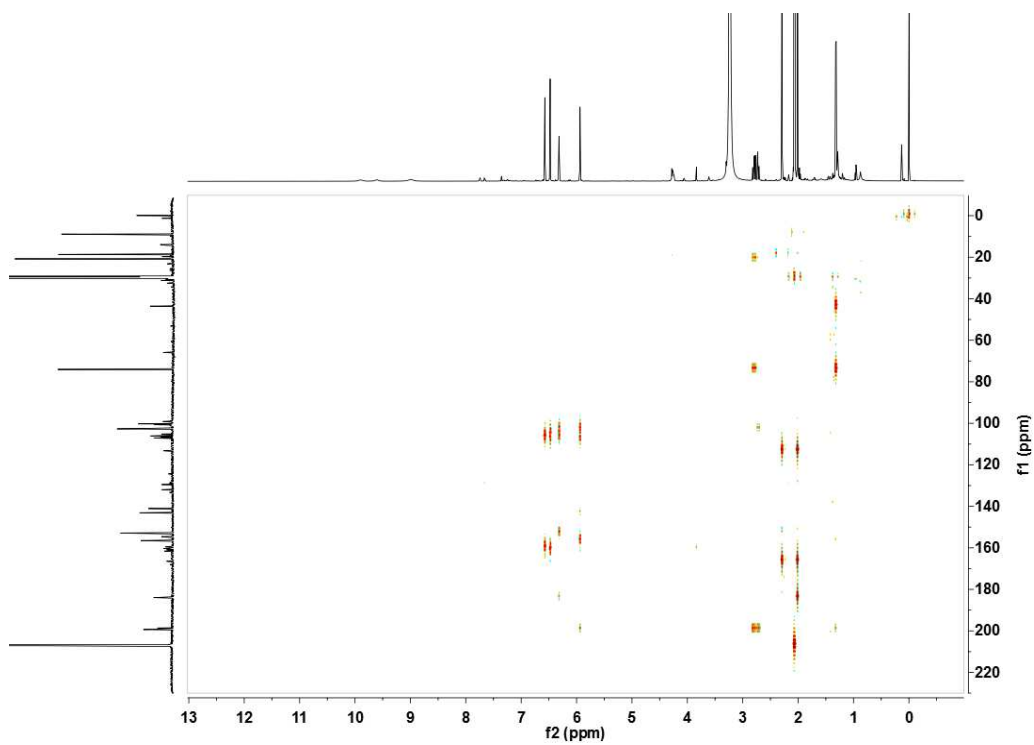


Figure 31S. HMBC spectrum of ustilaginoidin O (**5**)

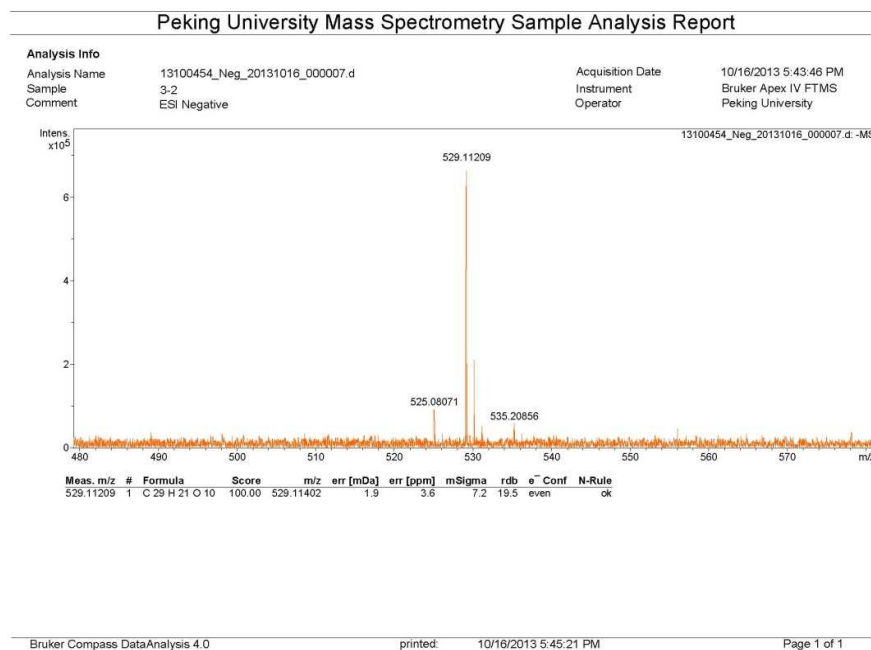


Figure 32S. HRESIMS spectrum of ustilaginoidin O (5)

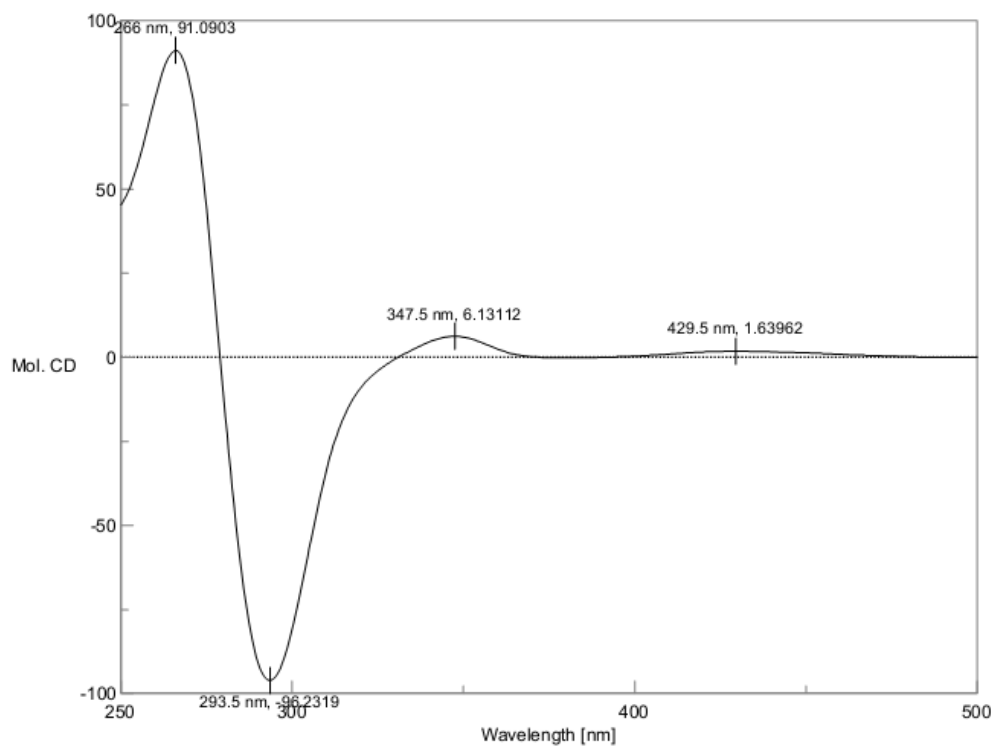


Figure 33S. CD spectrum of ustilaginoidin O (5) (DMSO)

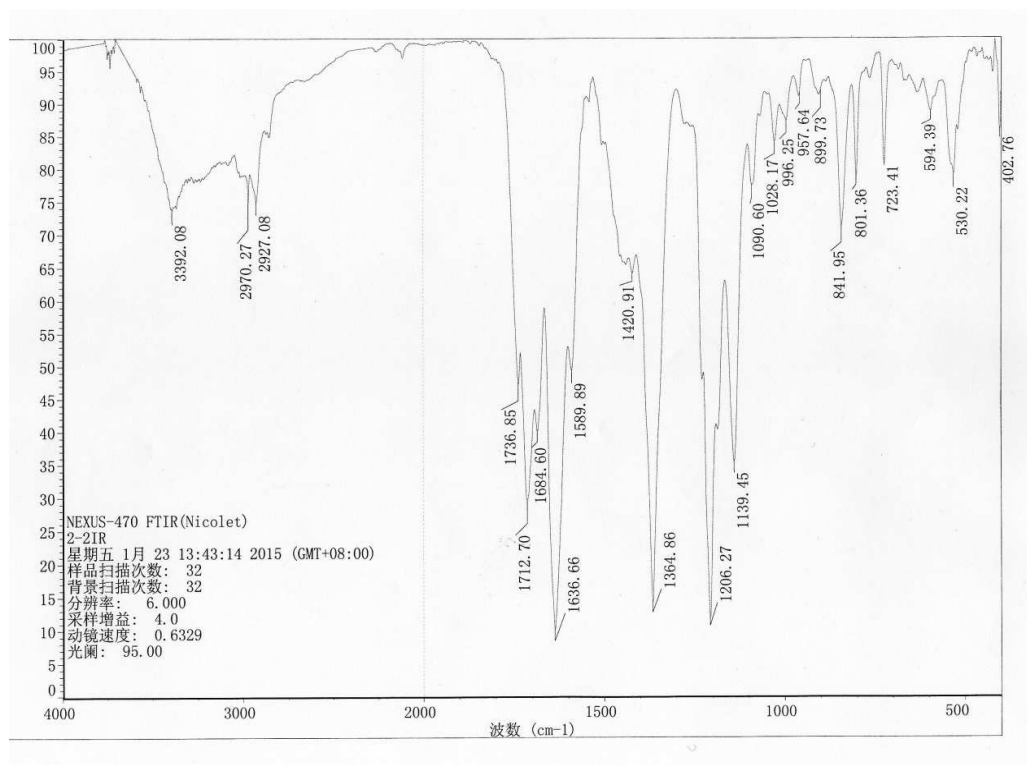


Figure 34S. IR spectrum of ustilaginoidin P (6)

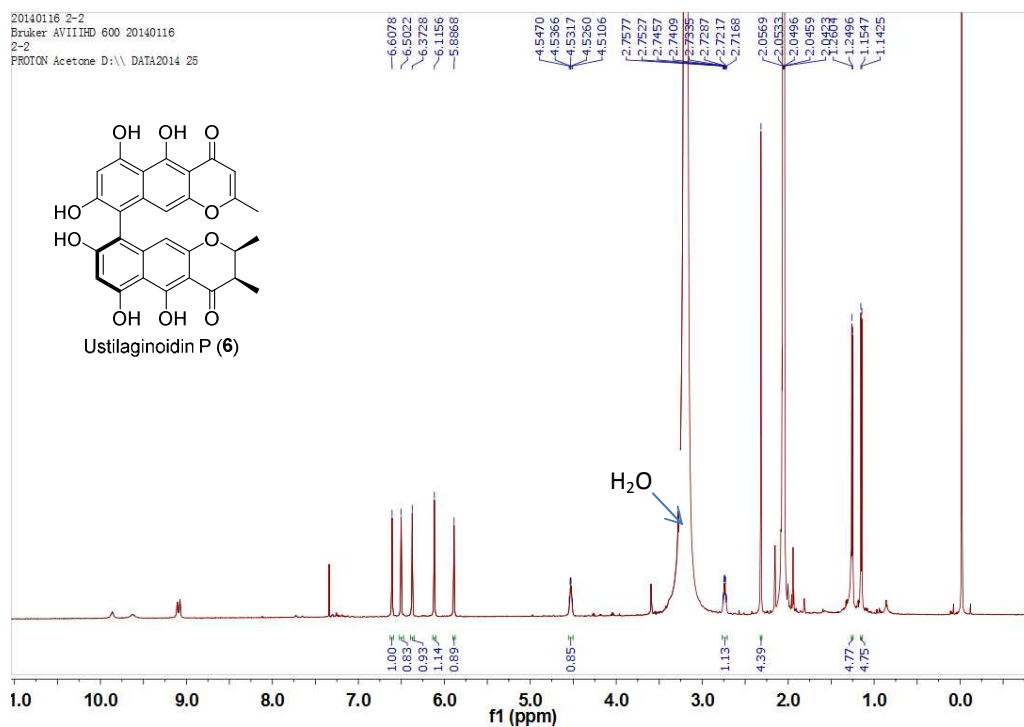


Figure 35S. ¹H NMR spectrum of ustilaginoidin P (6) (CD₃COCD₃, 600 MHz)

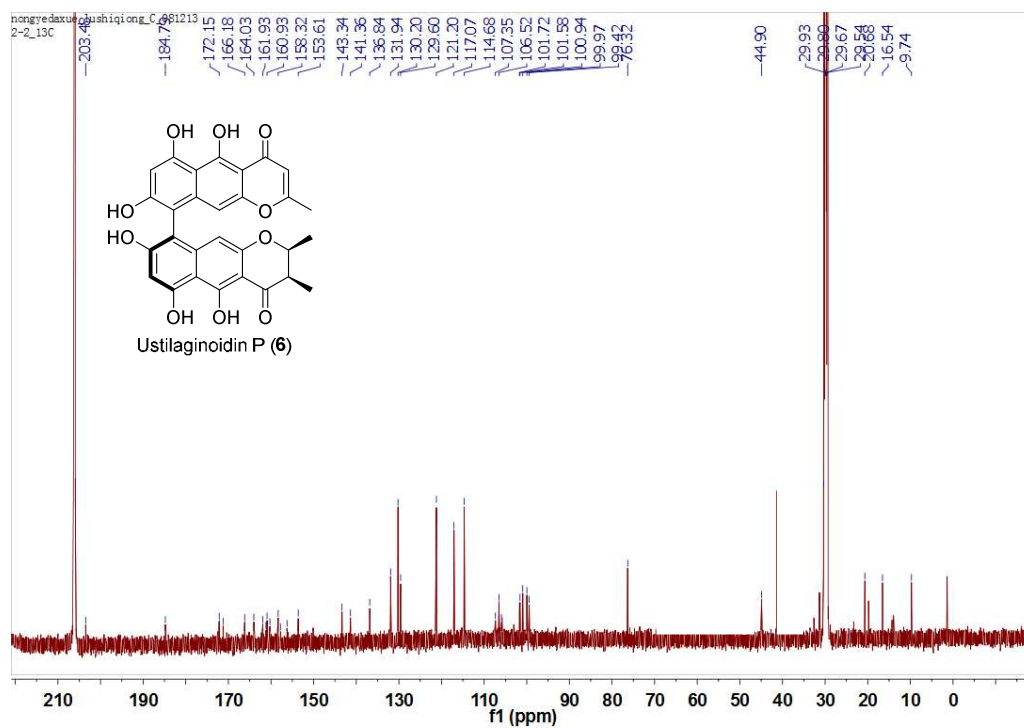


Figure 36S. ¹³C NMR spectrum of ustilaginoidin P (6) (CD₃COCD₃, 150 MHz)

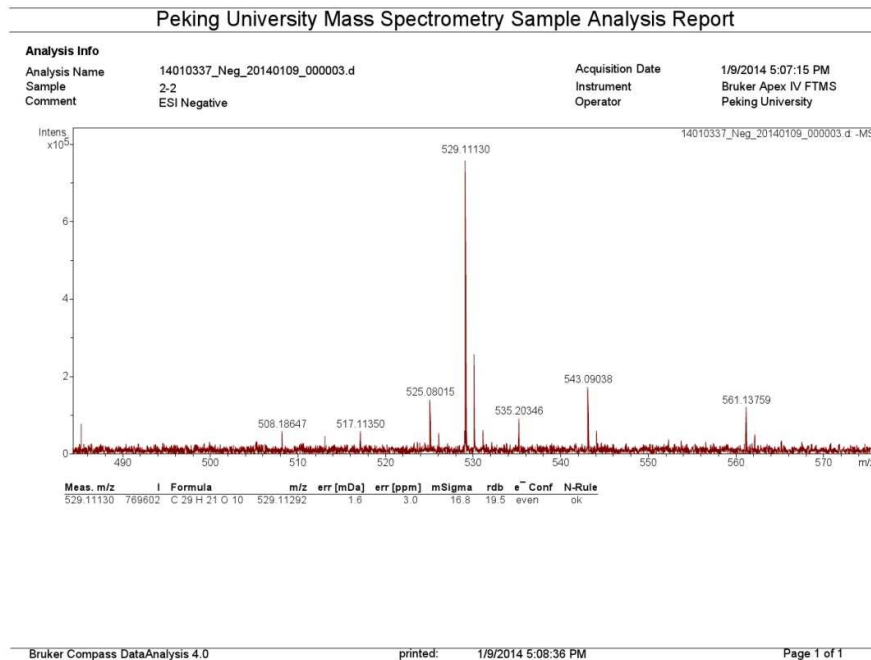


Figure 37S. HRESIMS spectrum of ustilaginoidin P (6)

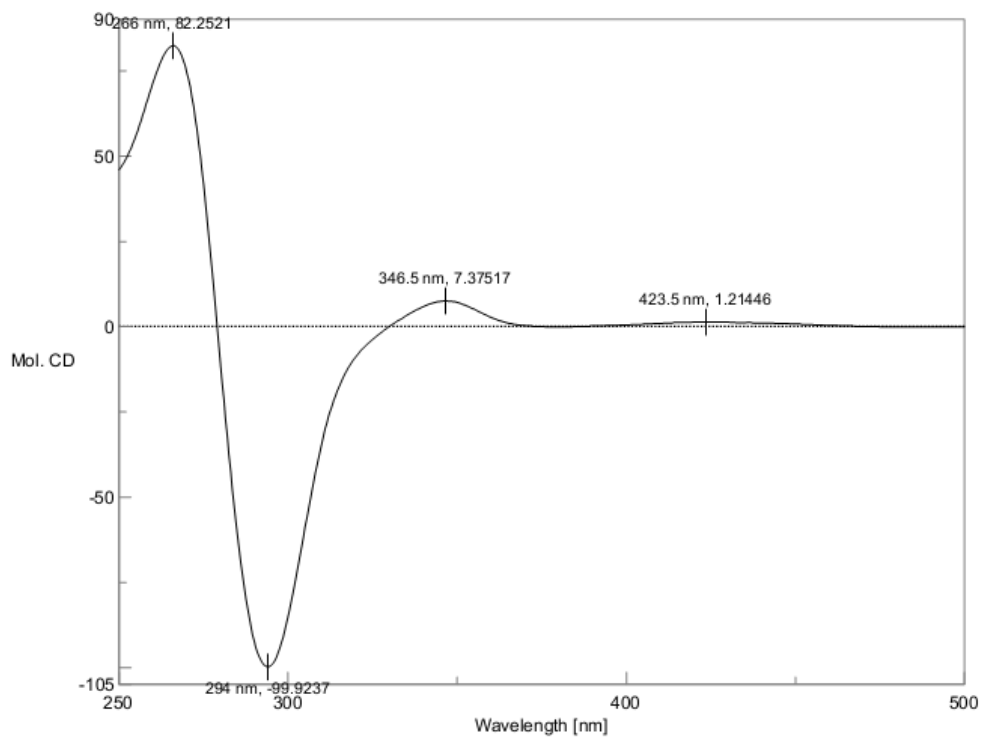


Figure 38S. CD spectrum of ustilaginoidin P (6) (DMSO)

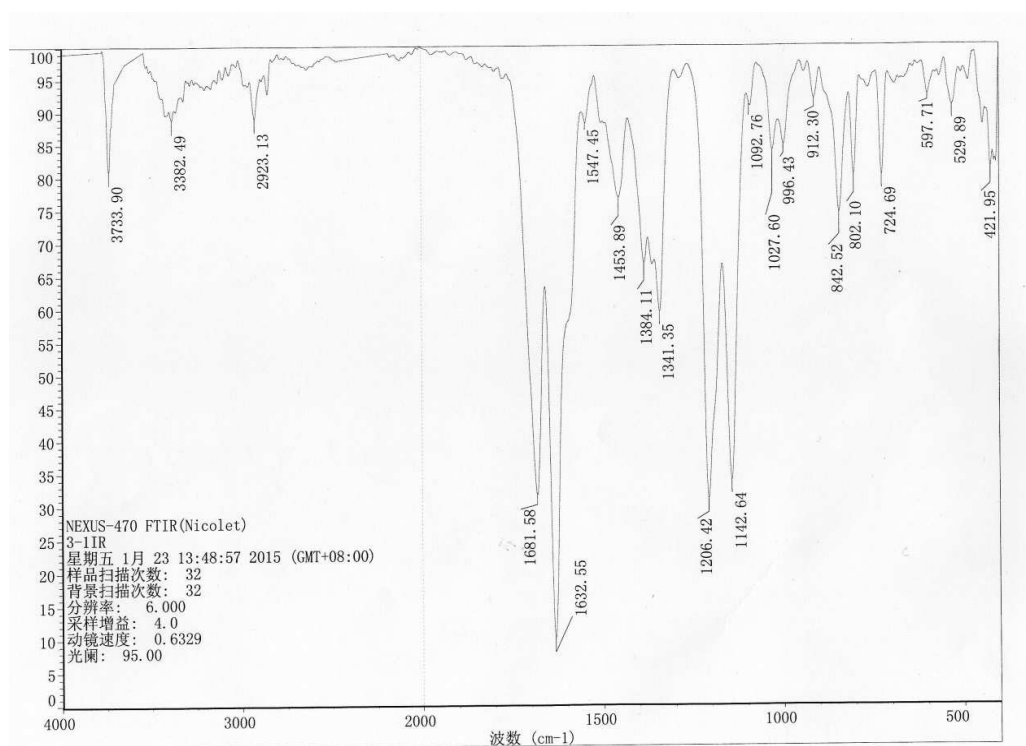


Figure 39S. IR spectrum of ustilaginoidin E₁ (7)

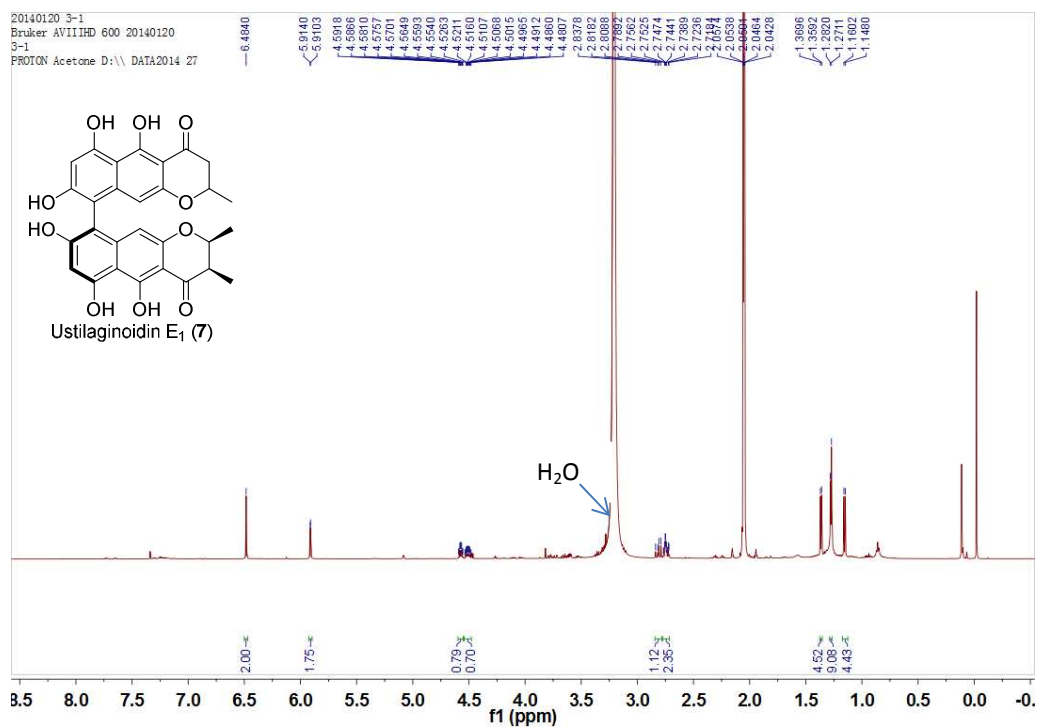


Figure 40S. ¹H NMR spectrum of ustilaginoidin E₁ (7) (CD₃COCD₃, 600 MHz)

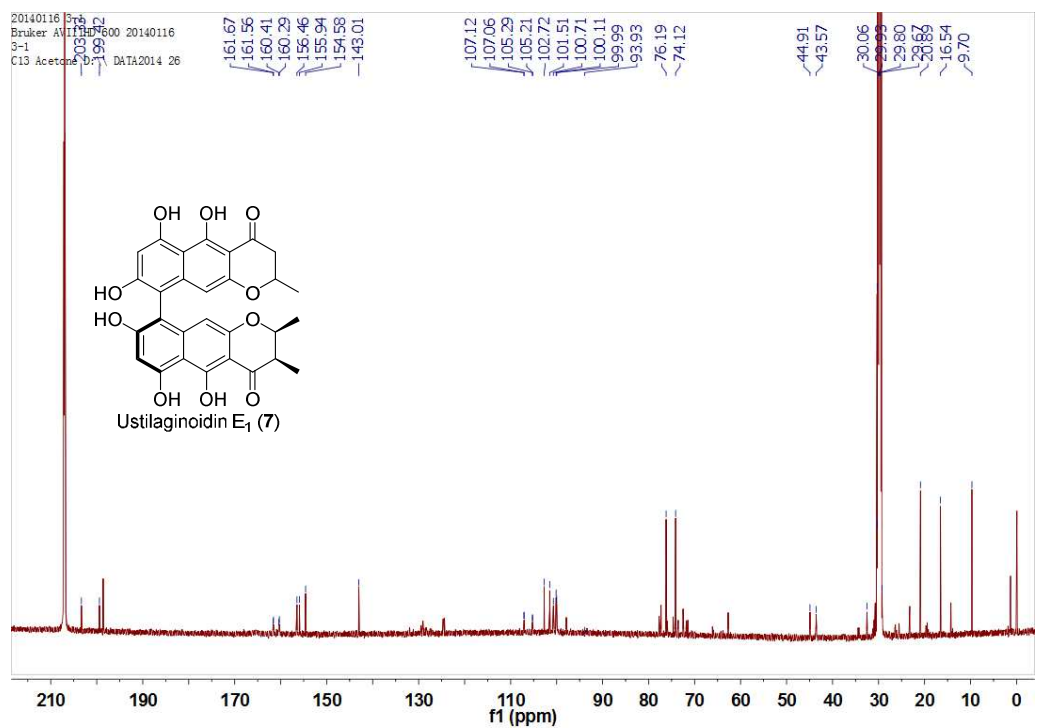


Figure 41S. ¹³C NMR spectrum of ustilaginoidin E₁ (7) (CD₃COCD₃, 150 MHz)

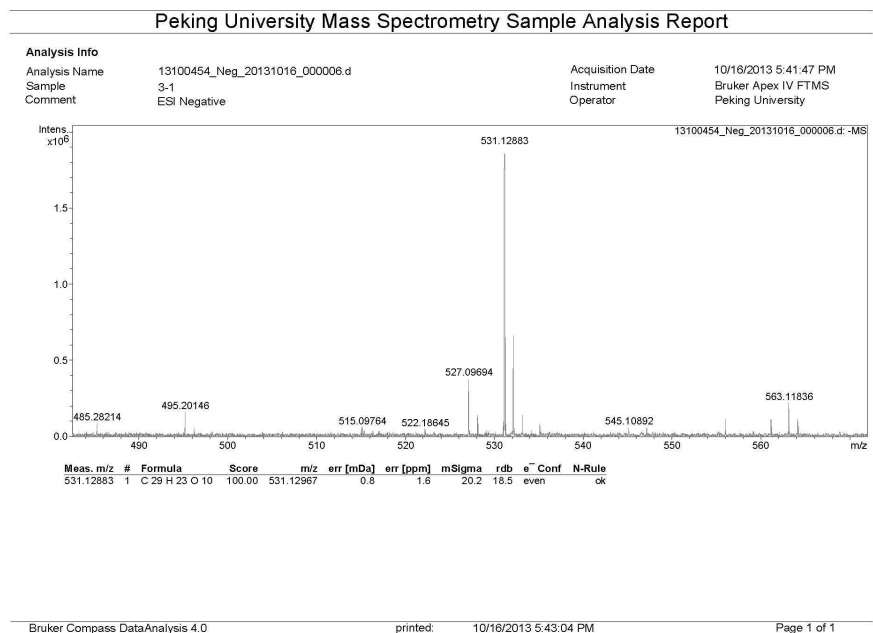


Figure 42S. HRESIMS spectrum of ustilaginoidin E₁ (7)

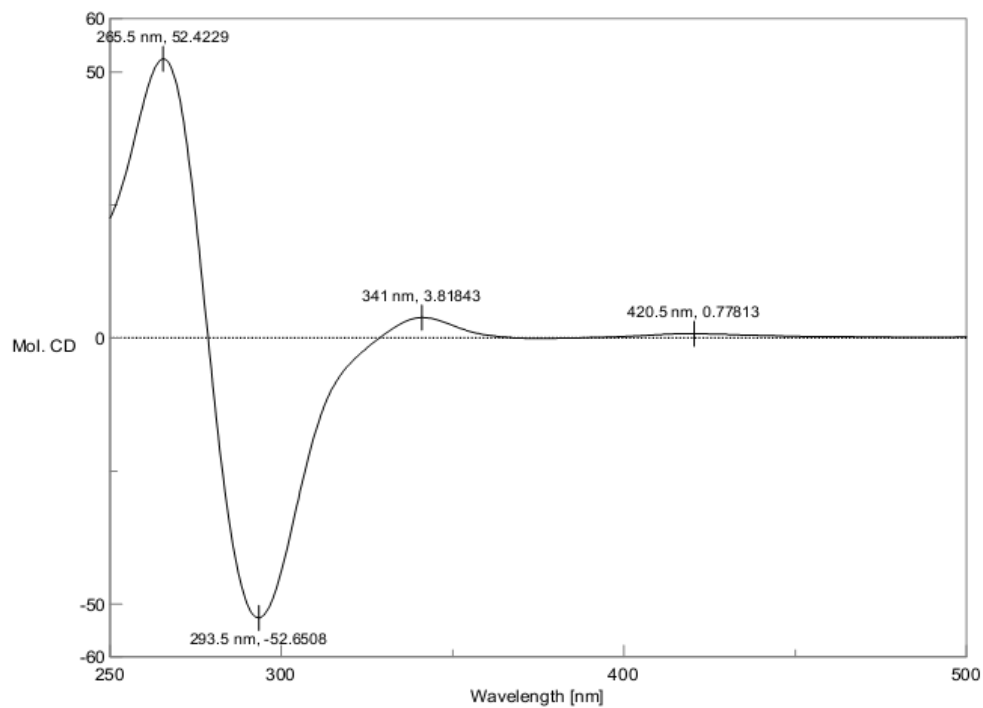


Figure 43S. CD spectrum of ustilaginoidin E₁ (7) (DMSO)