

SUPPLEMENTARY MATERIAL

Green synthesis of TiO₂ nanoparticles using natural marine extracts for antifouling activity

Walied M. Alarif¹, Yasser A. Shaban^{1*}, Mohamed I. Orif¹, Mohamed A. Ghandourah¹, Adnan J. Turki¹, Hajer S. Alorfi² and Hermine R. Z. Tadros³

¹ Department of Marine Chemistry, Faculty of Marine Sciences, King Abdulaziz University, Jeddah 21589, Saudi Arabia; welaref@kau.edu.sa (W.M.A.), ydomah@kau.edu.sa (Y.A.S.), mioraif@kau.edu.sa (M.I.O.), mghandourah@kau.edu.sa (M.A.G.), ajturki@yahoo.com (A.J.T.)

² Department of Chemistry, Faculty of Science, King Abdulaziz University, Jeddah 21589, Saudi Arabia; halorfi@kau.edu.sa

³ National Institute of Oceanography and Fisheries, Kayet Bay, Alexandria, Egypt; herminetadros@gmail.com

Correspondence: ydomah@kau.edu.sa (Y.A.S.); Tel.: +966-595-670522



A- *Bostrychia tenella*



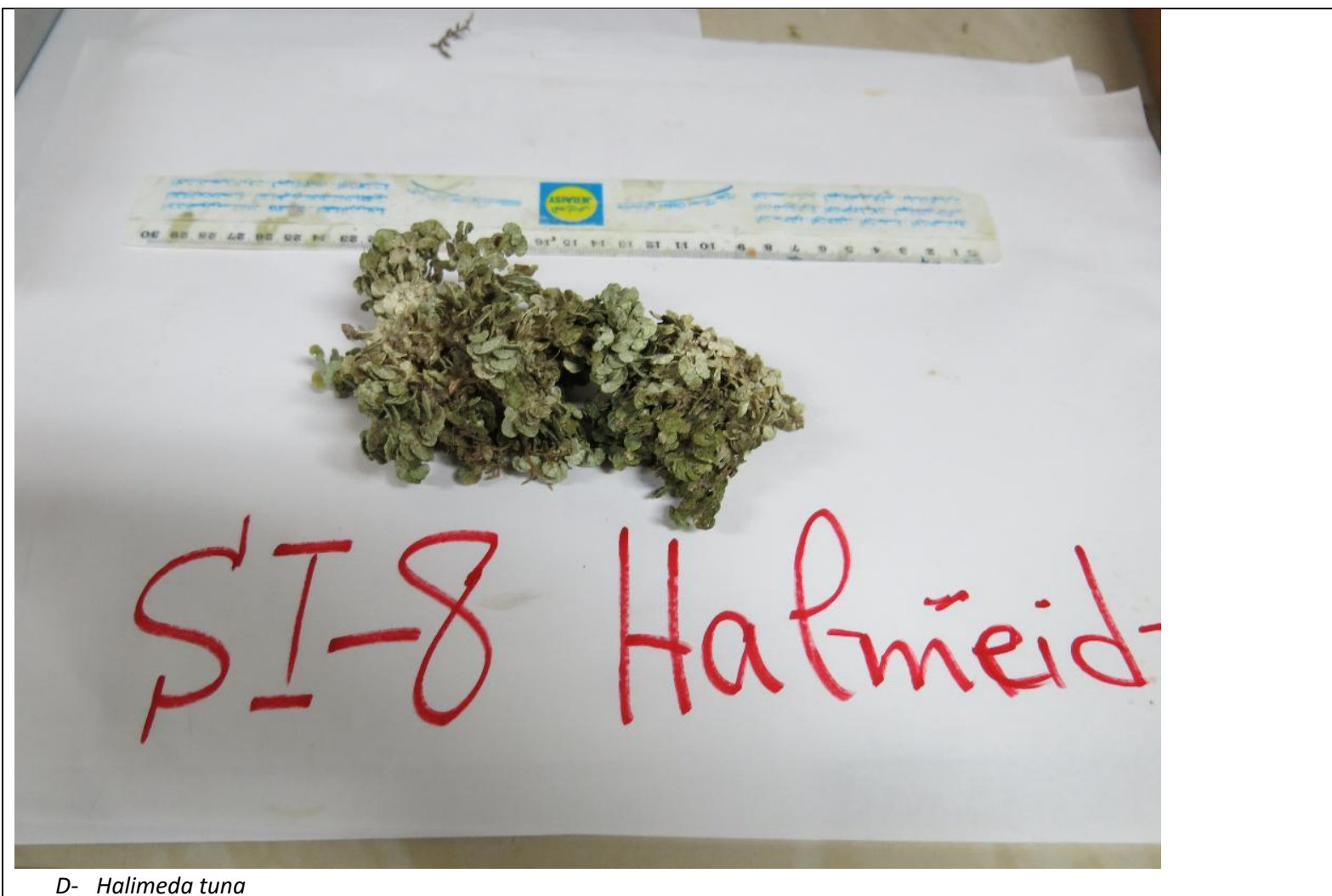
B- *Carteriospongia foliascens*



C- *Laurencia obtusa*



D- *Sargassum filipendula*



D- *Halimeda tuna*

Figure S1. Images of marine organisms: A- *Bostrychia tenella*, B- *Carteriospongia foliascens*, C- *Laurencia obtusa*, D- *Sargassum filipendula*, and E- *Halimeda tuna*.

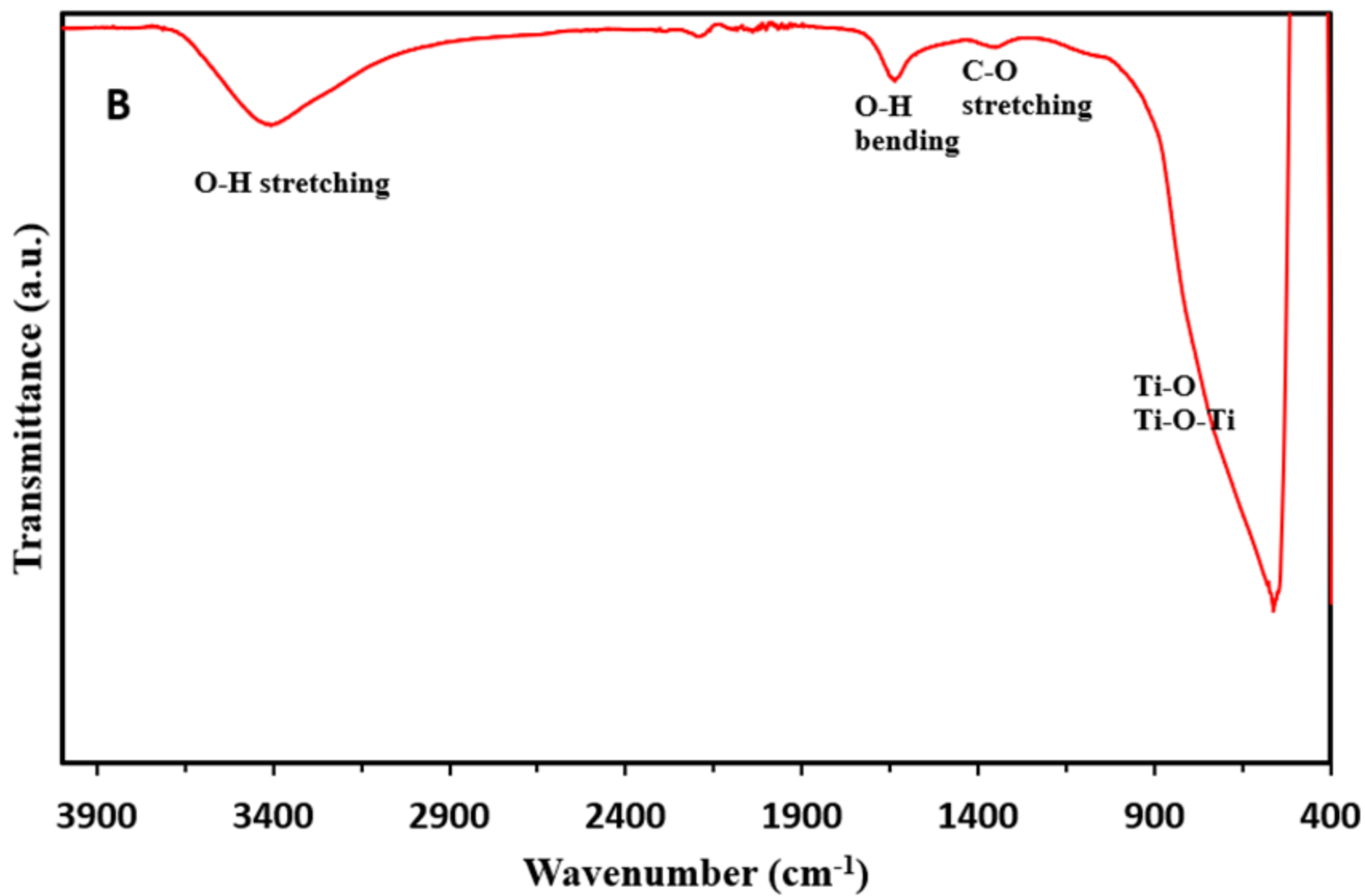


Figure S2. FTIR spectrum of CTiO₂.

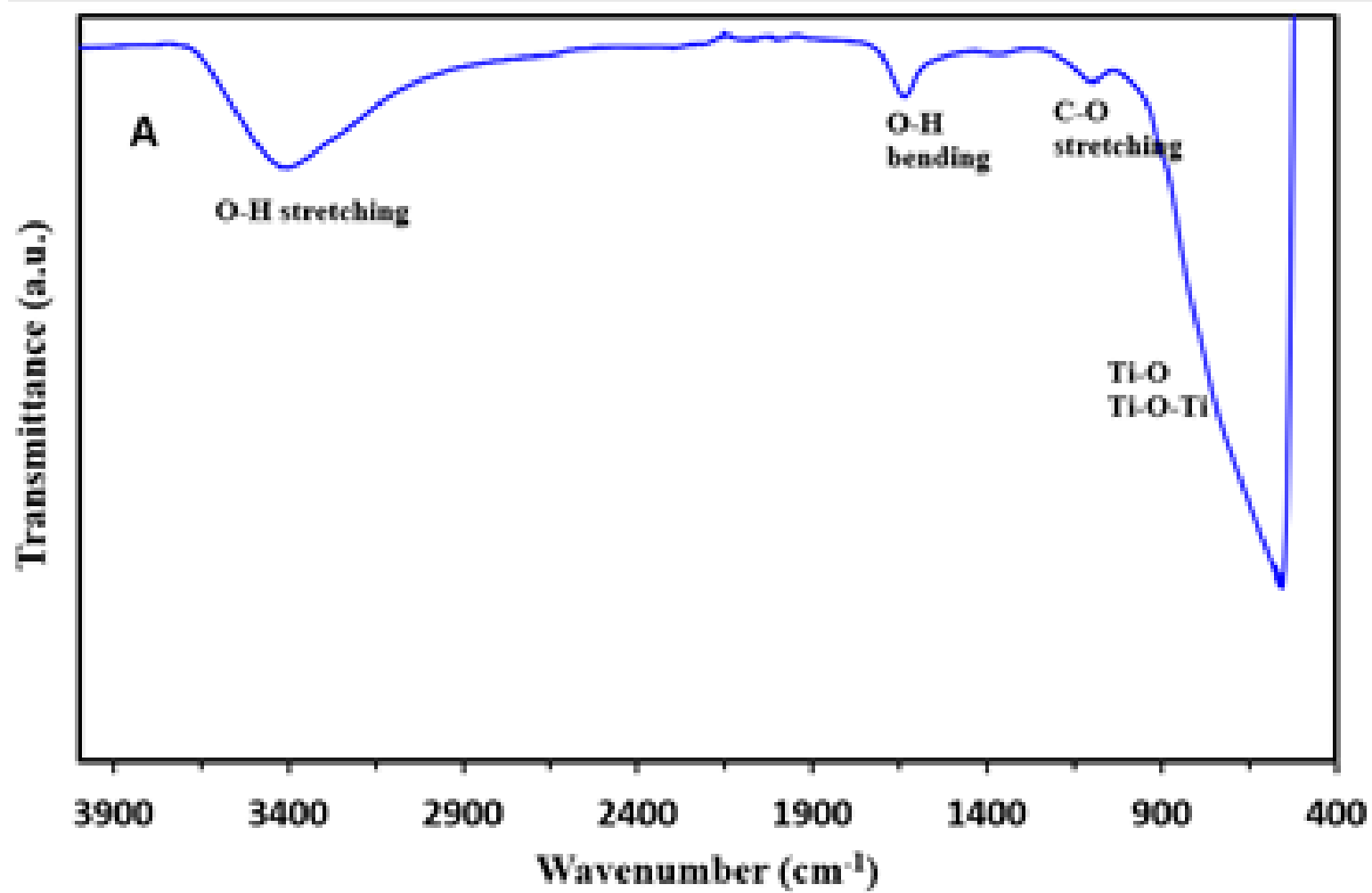


Figure S3. FTIR spectrum of BTiO₂.

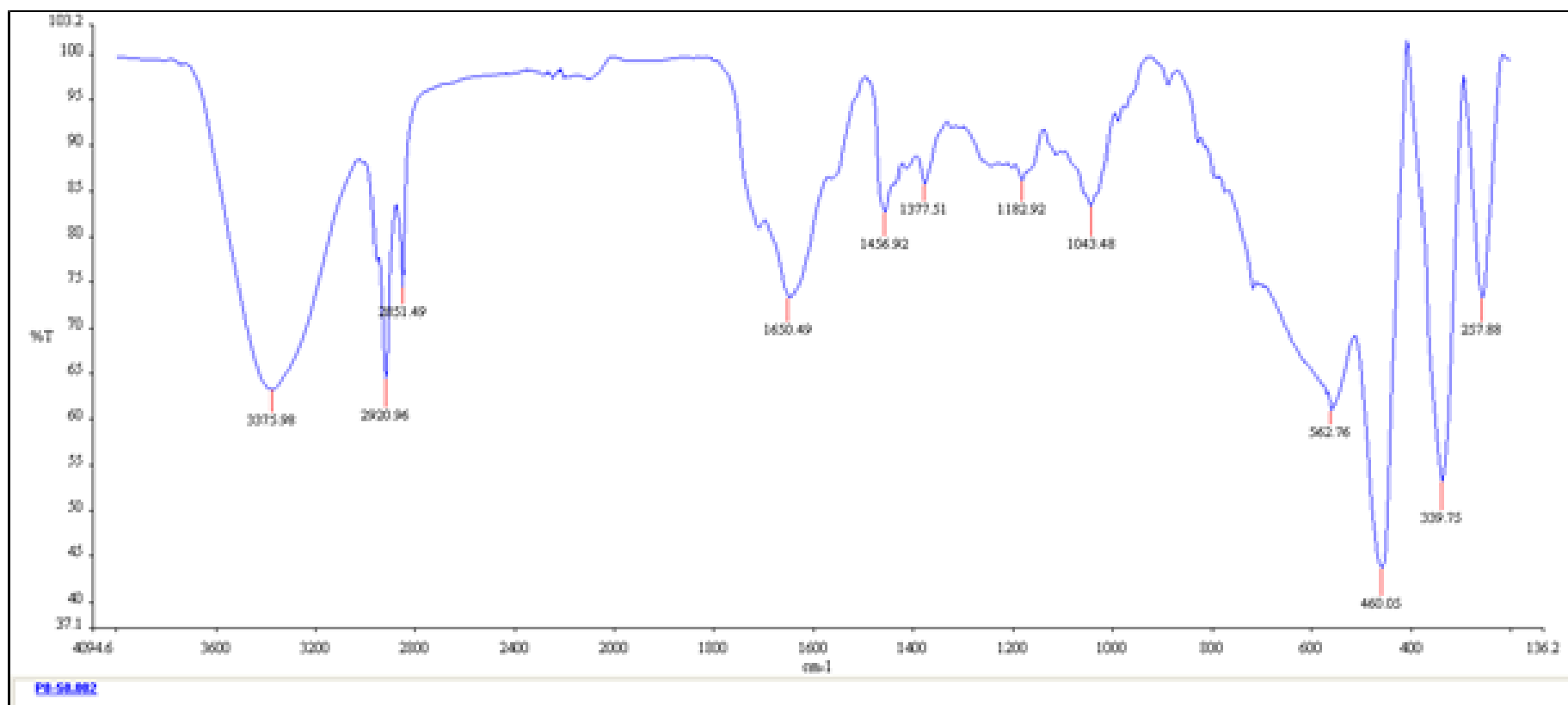


Figure S4. FTIR spectrum of *B. tenella* extract.

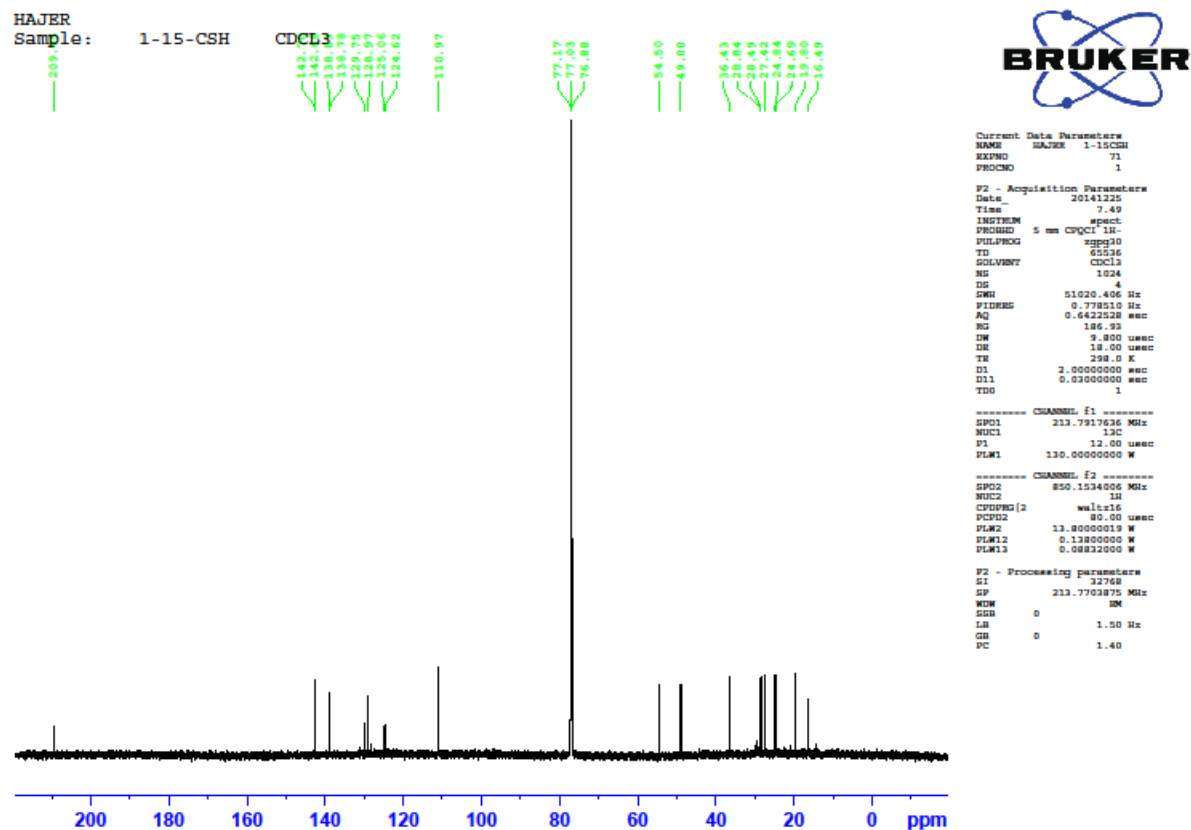


Figure S5. ¹³C-NMR of isofurospingin-2 isolated from *C. foliascens*.

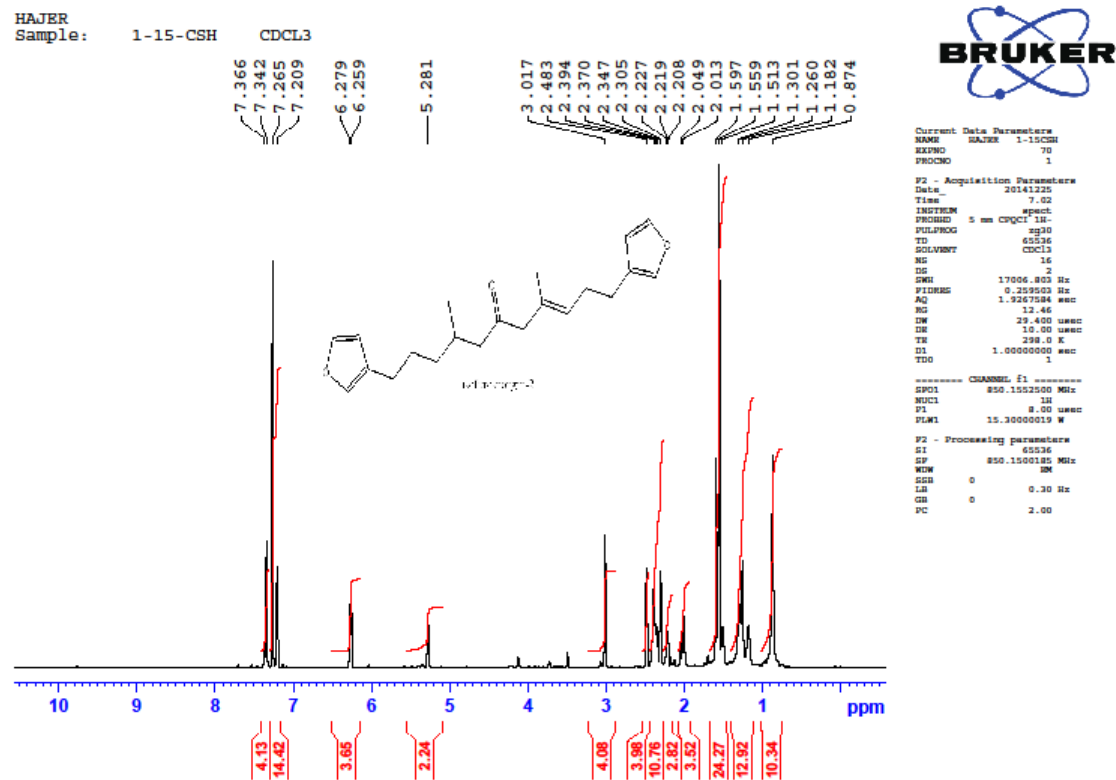


Figure S6. ¹H-NMR of isofurospongins-2 isolated from *C. foliascens*.



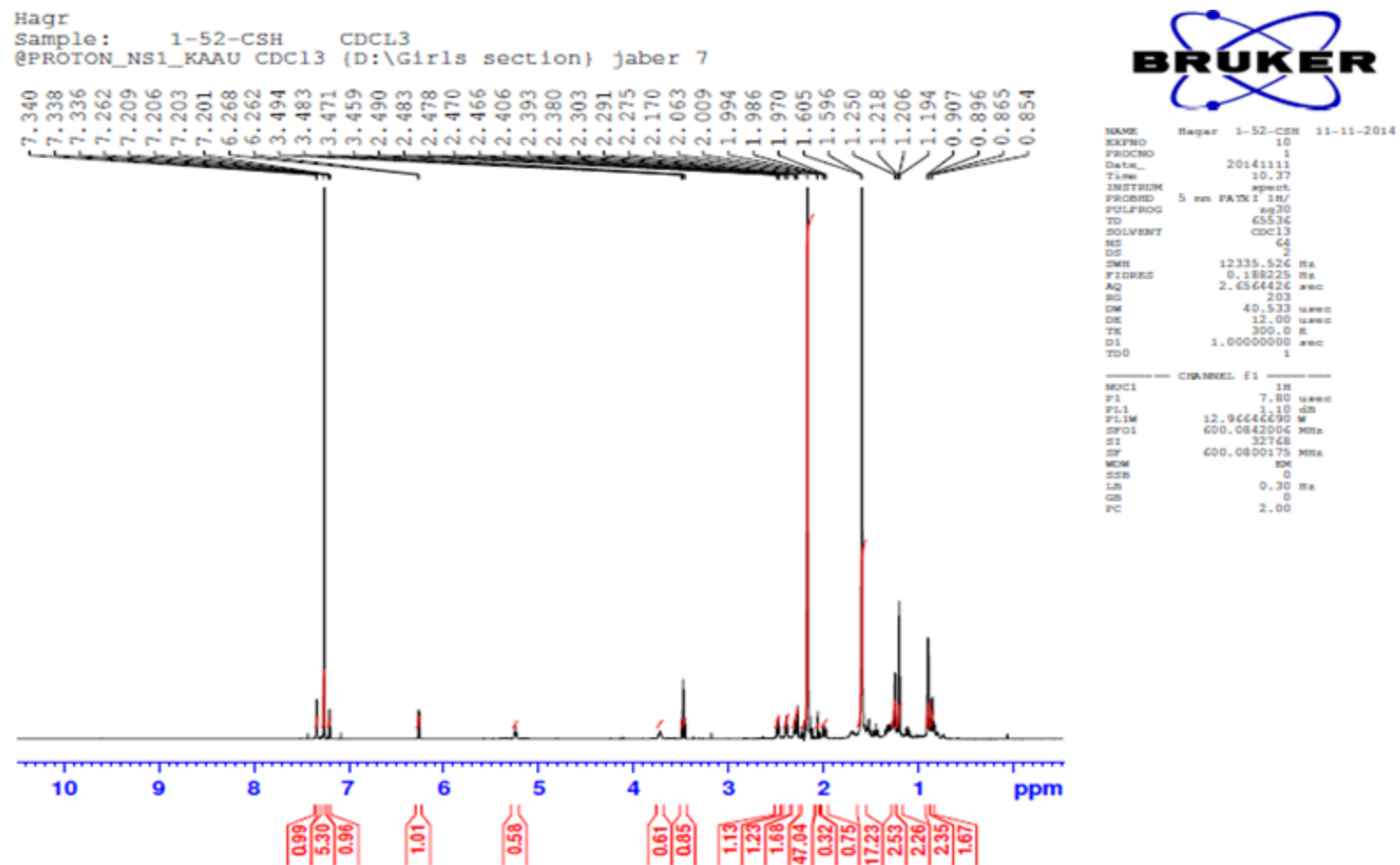


Figure S8. ^1H -NMR of furospongins-1 isolated from *C. foliascens*.

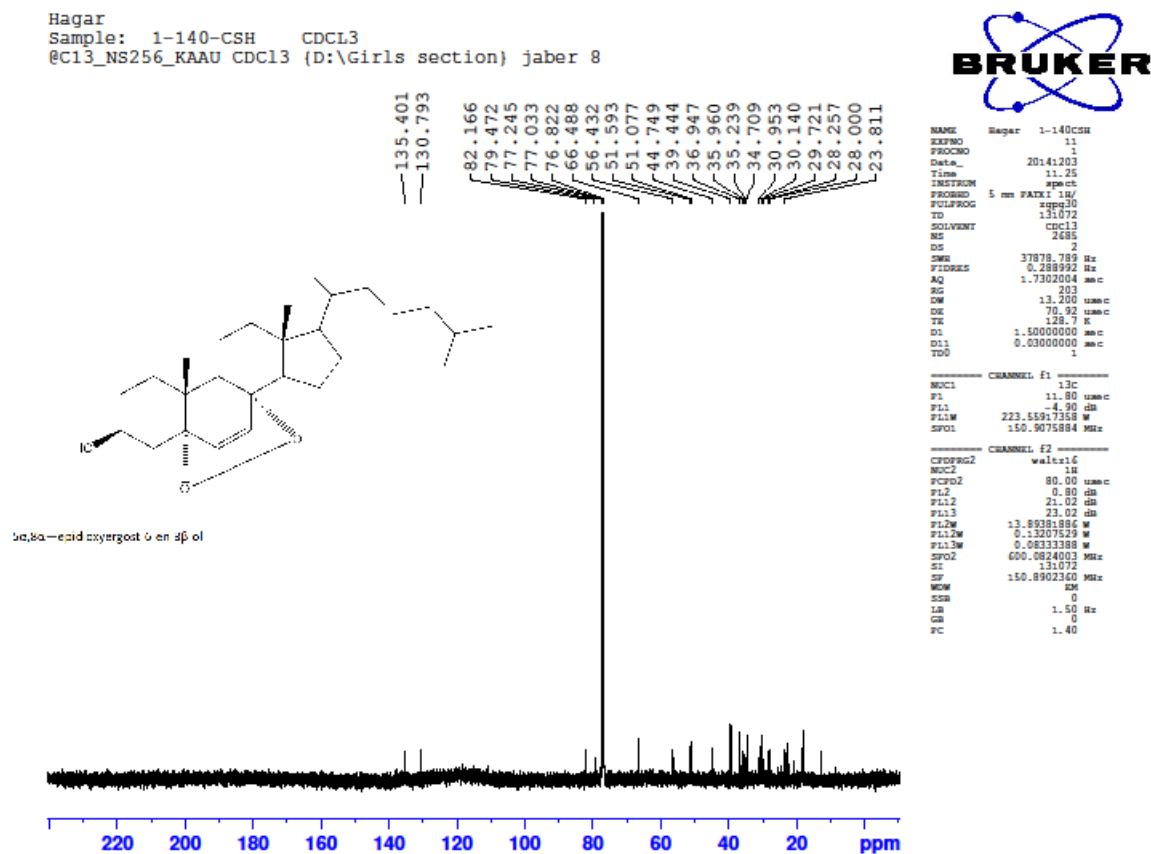
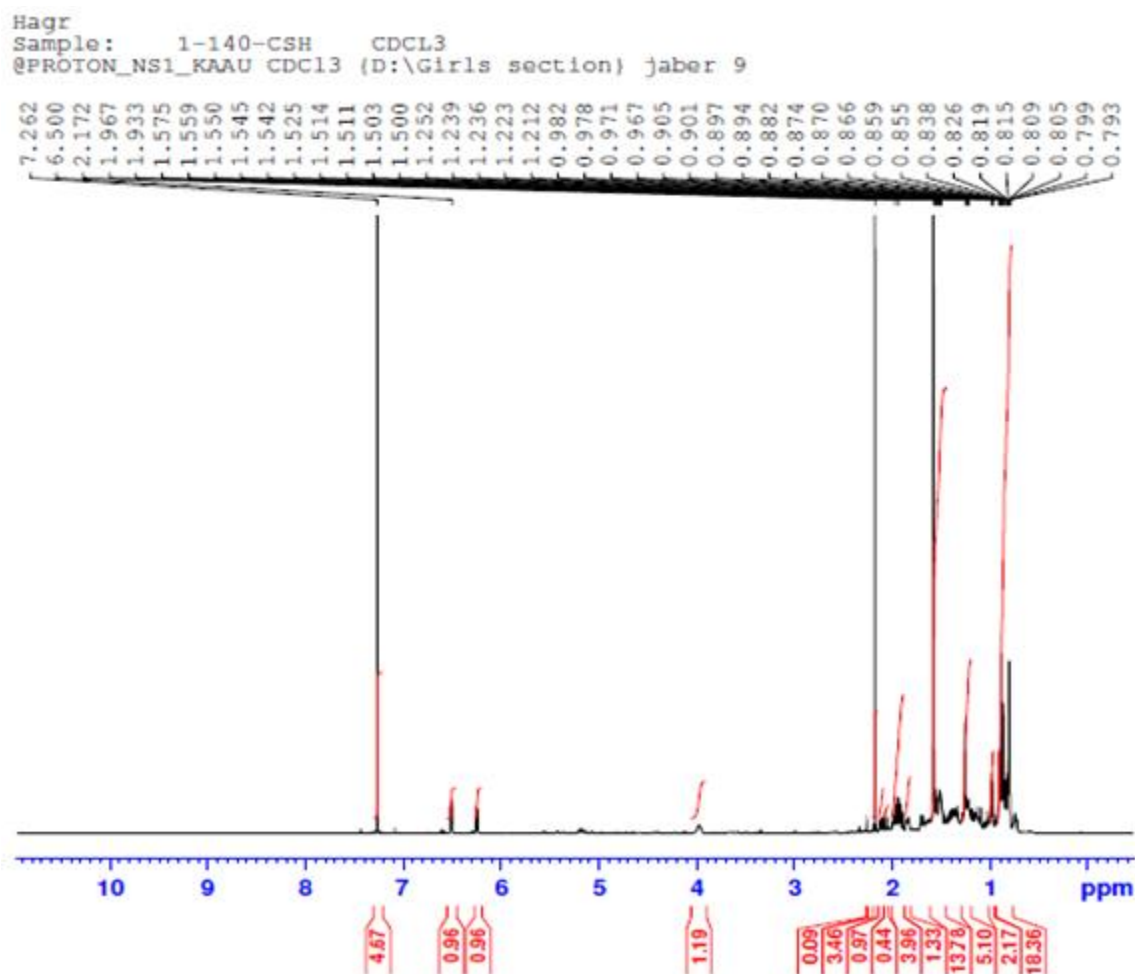


Figure S9. ^{13}C -NMR of 5 α ,8 α -epidioxyergost-6-en-3 β -ol isolated from *C. foliascens*.



NAME Hagar 1-140-CSH 11-11-2014
 KATNO 10
 PROBN 1
 Date 20141111
 Time 10:53
 INSTRUM spect
 PROBN 5 mm PAK11 1H/
 PULPROG zgpg30
 TO 41534
 SOLVENT CDCL3
 NS 64
 DS 2
 SWS 12325.524 Hz
 FIDRES 0.188225 Hz
 AQ 2.4564426 sec
 RG 203
 SW 45.523 ussec
 DE 12.00 ussec
 TE 300.00 K
 D1 1.00000000 sec
 TDC 1
 CHANNEL F1
 NUC1 1H
 P1 7.80 ussec
 PL1 0.00 dB
 PL1M 12.96646690 W
 SFO1 600.0842006 MHz
 IC 22768
 SC 600.080175 MHz
 WDM 8M
 SSF 0
 LB 0.20 Hz
 GB 0
 PC 2.00

Figure S10. ^1H -NMR of $5\alpha,8\alpha$ -epidioxyergost-6-en- 3β -ol isolated from *C. foliascens*.

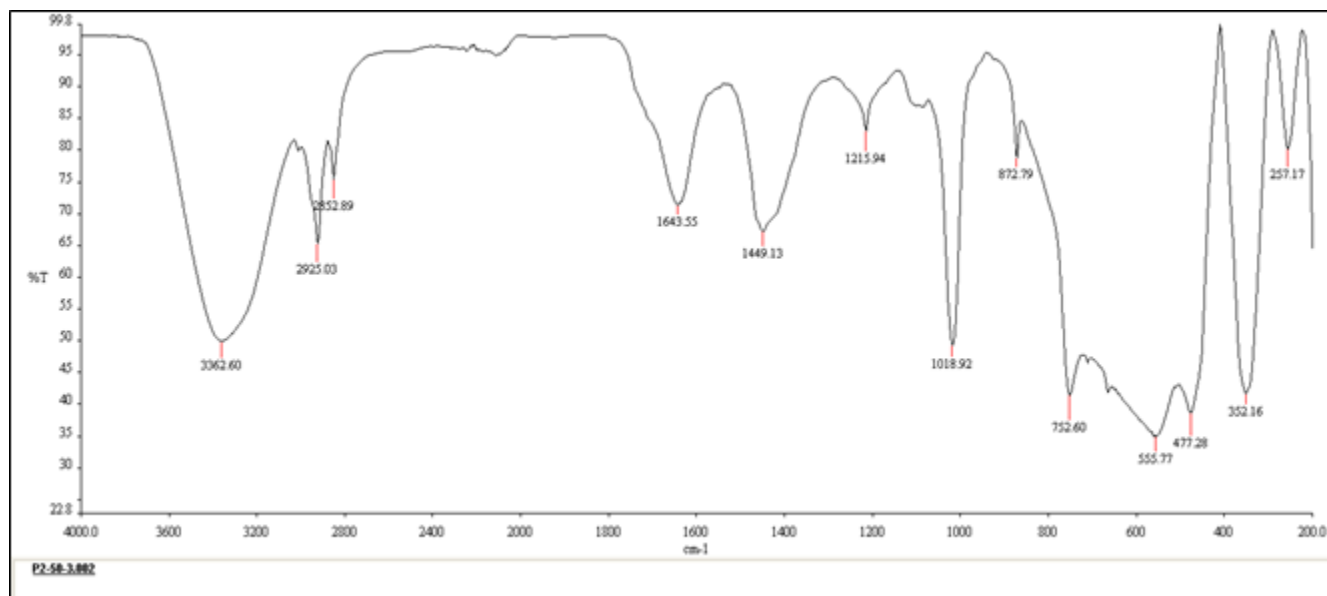


Figure S11. FTIR spectrum of *C. foliascens* extract.