SUPPLEMENTARY MATERIAL

New eudesmane-type sesquiterpenoid and known eudesmane derivatives from the Red Alga *Laurencia obtusa* as Potential Antifungal- Antitumor agents

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New eudesmane-type sesquiterpenoid and eudesmane derivatives from the Red Alga *Laurencia obtusa* as Potential Antifungal- Antitumor agents

Abstract

A new eudesmanes sesquiterpenoid, eudesma-4(15),7-diene-5,11-diol (**1**) along with a trinor-sesquiterene, teuhetenone (**2**) and a *seco*-eudesmanes sesquiterpene, chabrolidione B (**3**), have been isolated from the Red Sea red alga *Laurencia obtusa*. The chemical structures were elucidated on the basis of extensive spectroscopic analysis. The antifungal and cytotoxic activities of the isolated metabolites were tested against several fungi, yeast, and human mammary carcinoma cell line (MCF-7). **1** and **3** showed a much better activity (MIC; 2.9 μ M) than that of Amphotricin B (MIC; 4.6 μ M). Interestingly, compound **2**, the least active antifungal compound, retained the most anticancer activity against MCF-7 (22 μ M) in comparison to cisplatin (59 μ M) employing lactate dehydrogenase (LDH) assay. **1-3** are recorded here for the first time from algal flora. The chemotaxonomic importance of the isolated metabolites was discussed.

Keywords: Red Algae; terpenoids; eudesmanes; cytotoxicity; antifungal activity.

Dr.Seef
Sample: 1-1-137L02 CDCL3
@PROTON_NS1_KAAU CDC13 {D:\seef} jaber 9

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NAME      See F 1-1-137L02  19-03-2013
EXPNO     10
PROCNO    1
Date_     20130319
Time      18.59
INSTRUM   spect
PROBHD    5 mm CPDCH 13C
PULPROG   zg30
TD         65536
SOLVENT   CDCl3
NS         20
DS         2
SWH        12335.526 Hz
FIDRES     0.188225 Hz
AQ         2.6564426 sec
RG         80.6
CW         40.533 usec
DE         12.00 usec
TE         303.0 K
D1         1.00000000 sec
TD0        1

===== CHANNEL f1 =====
NUC1       1H
P1         9.90 usec
PL1        -0.70 dB
PL1W       19.62554169 W
SFO1       600.0842006 MHz
SI         32768
SF         600.0800174 MHz
WDW        EM
SSB        0
LB         0.30 Hz
GB         0
PC         2.00

```

Figure S1a: ^1H NMR of compound 1

Figure S1b: ^1H NMR of compound 1

Figure S1c: ^1H NMR of compound 1

Dr.Seef
Sample: 1-1-137LO2 CDCL3
@c13_NS256_KAAU CDCL3 (D:\seef) jaber 9

```

NAME          Seef 1-1-137LO2  19-03-2013
EXPNO         1
PROCNO        1
Date_         20130319
Time          20.32
INSTRUM       spect
PROBHD        5 mm CPDQCF 13C
PULPROG       zgpg30
TD            131372
SOLVENT       CDCL3
NS            2048
DS            4
SWH           37876.769 Hz
FIDRES        0.286992 Hz
AQ            1.7362204 sec
RG            303
DSW           13.200 usec
DE            71.32 usec
TE            303.0 K
DT            1.5000000 sec
D11           0.0300000 sec
TD0           1

===== CHANNEL f1 =====
NUC1           13C
P1             9.90 usec
PC1            2.00 dB
PL1W          37.96579361 W
SFO1          100.625384 MHz

===== CHANNEL f2 =====
CFOFREQ2       waitz16
NUC2           1H
PCF02         70.00 usec
PL2           -0.70 dB
PL12          16.29 dB
PL13          19.29 dB
PL1W          19.62554169 W
PL12W         0.39248362 W
PL13W         0.19470779 W
SFO2          400.0824003 MHz
S1            131372
SF            100.8902387 MHz
WDW           RM
SSB            0
LB             1.00 Hz
GB             0
PC             1.40

```

Figure S1d: ^{13}C NMR of compound 1

Dr. Seef
Sample: 1-1-137L02 CDCl₃
@C13_NS256_KAAU CDCl₃ (D:\seef) jaber 9

Figure S1e: ¹³C NMR of compound 1

Dr.Seef
Sample: 1-1-137LO2 CDCL3
@C13_NS256_KAAU CDCL3 {D:\seef} jaber 9

Figure S1e: ¹³C NMR of compound 1

Dr. Seef
Sample: 1-1-137LO2 CDCl3
@COSY_NS2_KAAJ CDC13 (D:\seef) jaber 12

Figure S1f: COESY NMR of compound 1

Dr.Seef
Sample: 1-1-137LO2 CDCL3
@DEPTQ_CHN135_NS256_KAAU CDCL3 {D:\seef} jaber 12

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NAME      Seef 1-1-137LO2  26-03-2013
EXPNO     12
PROCNO    1
Date_     20130327
Time      11.21
INSTRUM    spect
PROBHD     5 mm CPDCH 12C
PULPROG    zgpg30
TD         131072
SOLVENT    CDCL3
NS         256
DS         2
SWH         37878.769 Hz
FIDRES     0.288992 Hz
AQ         1.7322004 sec
RG         203
SW         13.200 usec
DE         10.00 usec
TE         303.0 K
CNS2       145.0000000
D1         2.00000000 sec
D2         0.00344828 sec
D12        0.0002000 sec
TD0        1

===== CHANNEL f1 =====
NUC1       13C
P1         9.90 usec
PL1        2000.00 usec
PL0        120.00 dB
PL11       2.00 dB
PL10W      0.0000000 W
PL1W       37.96579361 W
SFO1       100.9013216 MHz
SF2        15.05 dB
SFOA12     0.100
SFOFF52    0.00 Hz

===== CHANNEL f2 =====
CPOFFAG2   wait16
NUC2       1H
P2         9.90 usec
P4         13.00 usec
PCPD2      70.00 usec
PL2        -10.70 dB
PL12       16.29 dB
PL1W       19.62554169 W
PL10W      0.30243562 W
SFO2       600.0824003 MHz
D1         13.1072
SF         100.8902387 MHz
SF        0
WDM        RM
SSB        0
LB         1.00 Hz
GB         0
PC         2.00

```

Figure S1g: DEPT NMR of compound 1

Figure S1h: HSQC NMR of compound 1

Dr.Seef
Sample: 1-1-137L02 CDCl3
@HMBGplp2nd_NS4_KAAU CDC13 (D:\seef) jaber 12

Figure S1i: HMBC NMR of compound 1

Figure S2. Key ^1H - ^1H COSY (—) and HMBC (—→) correlations of compound **1**