

SUPPLEMENTARY MATERIAL

A unique C-linked chalcone-dihydrochalcone dimer from *Dracaena cinnabari* resin

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Abstract

A new C-linked chalcone-dihydrochalcone dimer, named dracidione, was isolated from the ethyl acetate extract of dragon's blood resin of *Dracaena cinnabari* Balf. f. Structure elucidation of the new compound was carried out by means of one- and two-dimensional NMR spectroscopy in addition to high resolution mass spectrometry. The unique structure incorporated a chalcone and a dihydrochalcone, which is reported for the first time from nature. Furthermore, dracidione showed moderate α -glucosidase inhibitory activity with $IC_{50} = 40.27 \mu\text{g/ml}$.

Keywords: *Dracaena cinnabari*; Dragon's blood; chalcone; dihydrochalcone; α -glucosidase

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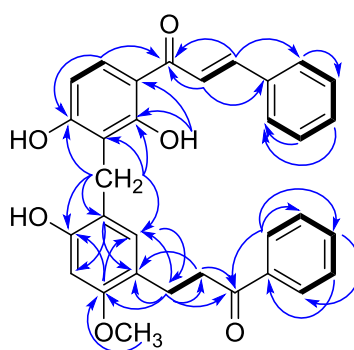


Figure S1: Selected key HMBC (\curvearrowright) and ^1H - ^1H COSY (—) correlations of dracidione.

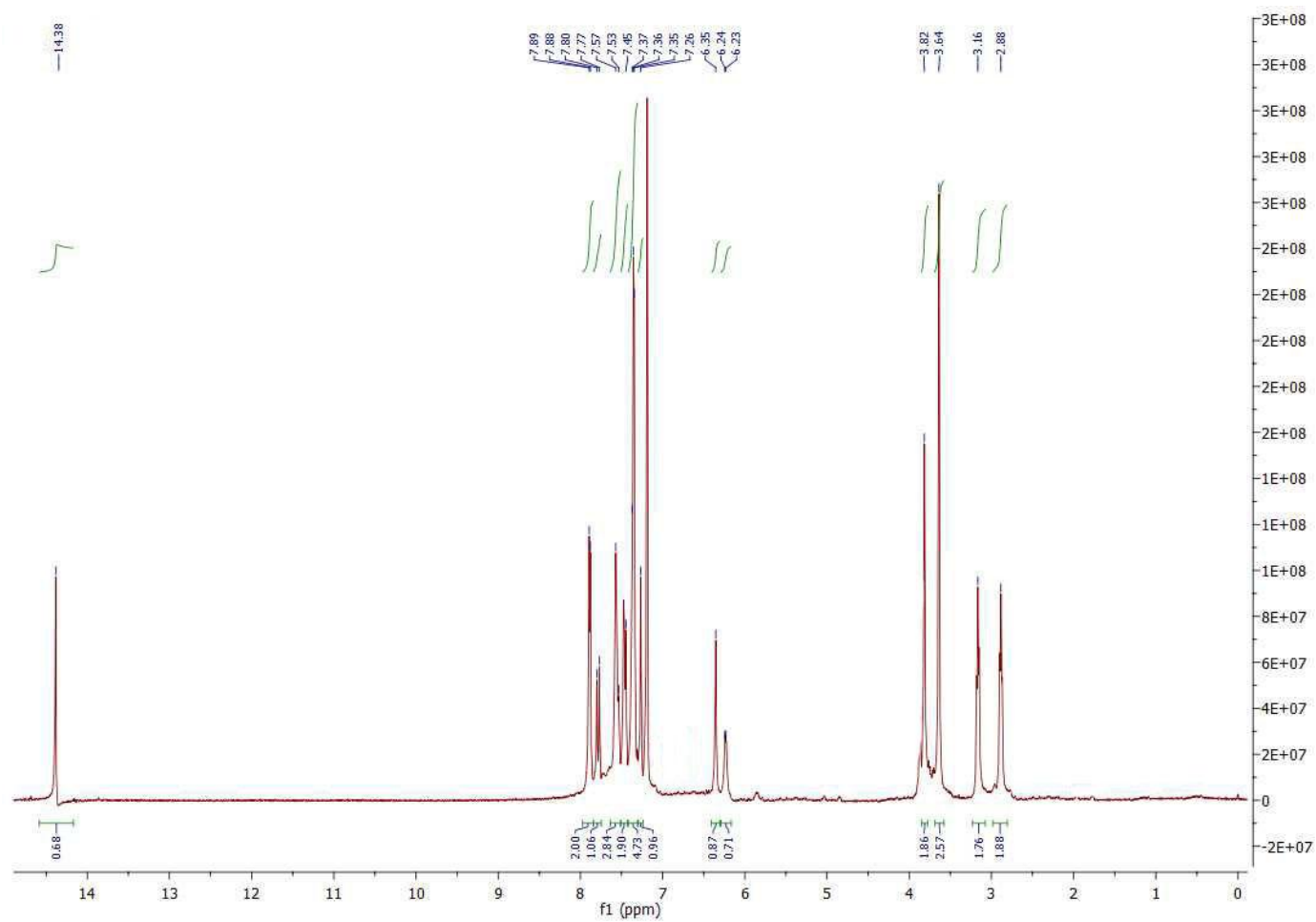


Figure (S.2): ^1H -NMR spectrum of dracidione. (500 MHz, CDCl_3).

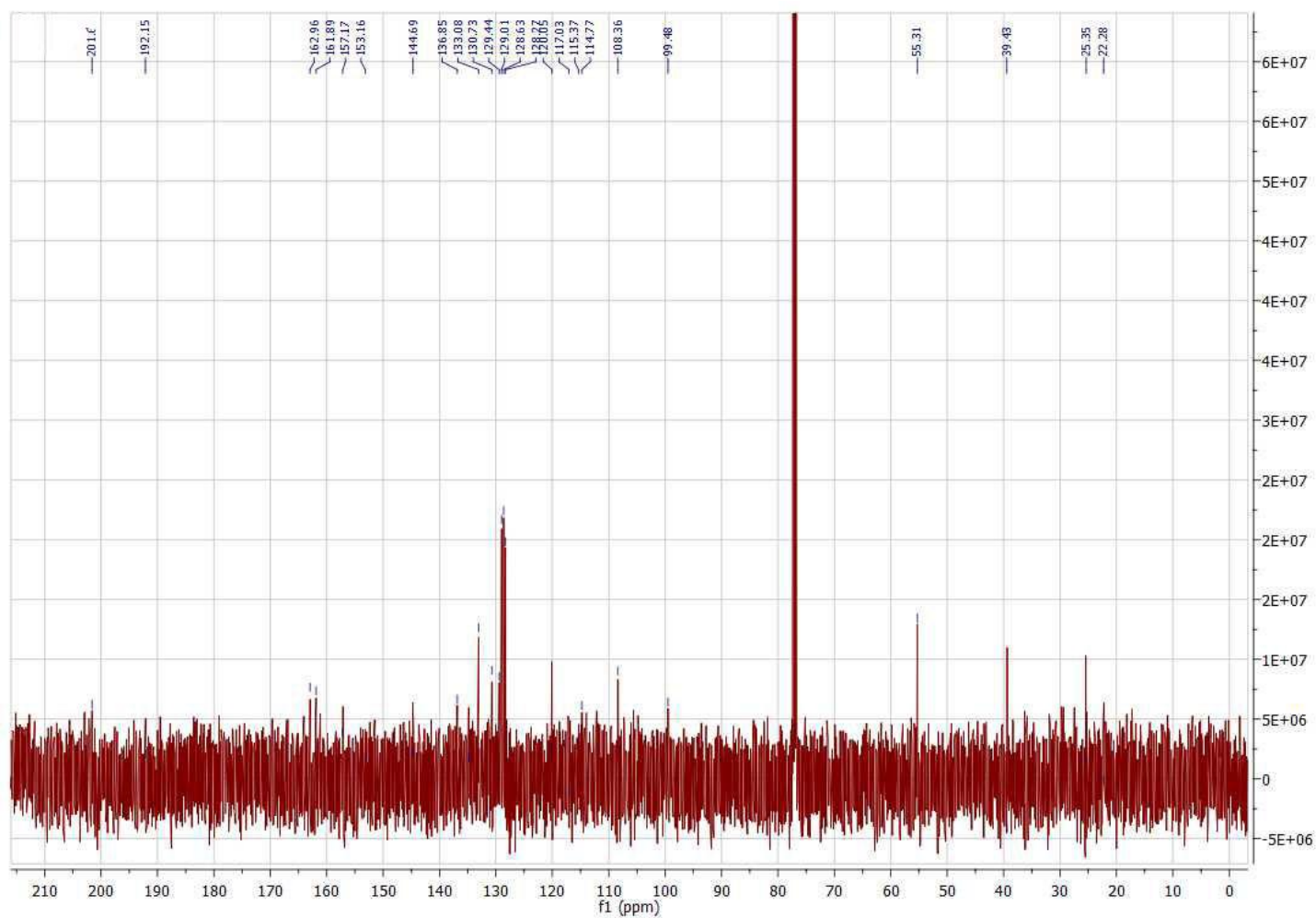


Figure (S.3): ^{13}C -NMR spectrum of dracidione. (125 MHz, CDCl_3).

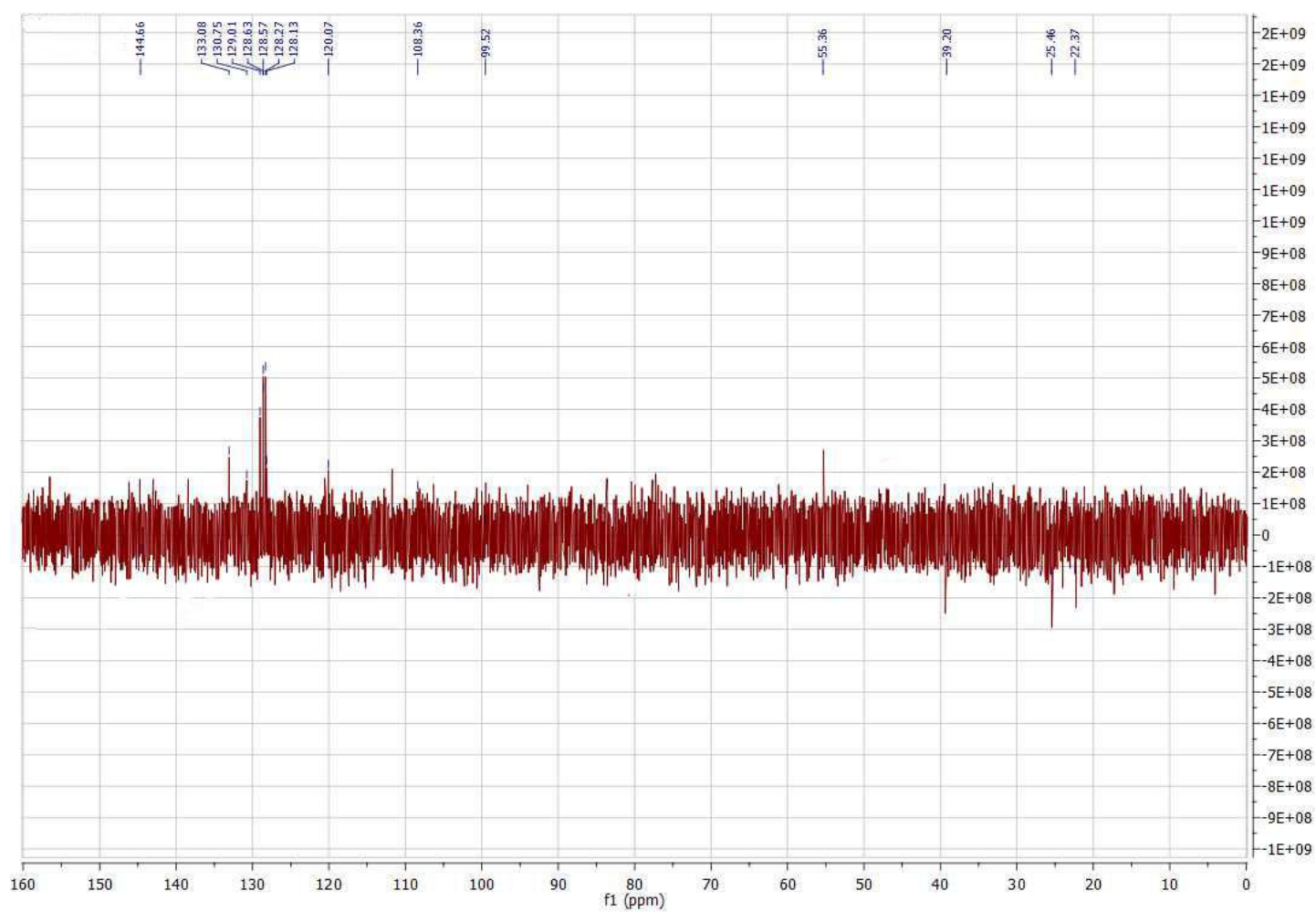


Figure (S.4): DEPT-135 spectrum of dracidione. (125 MHz, CDCl_3).

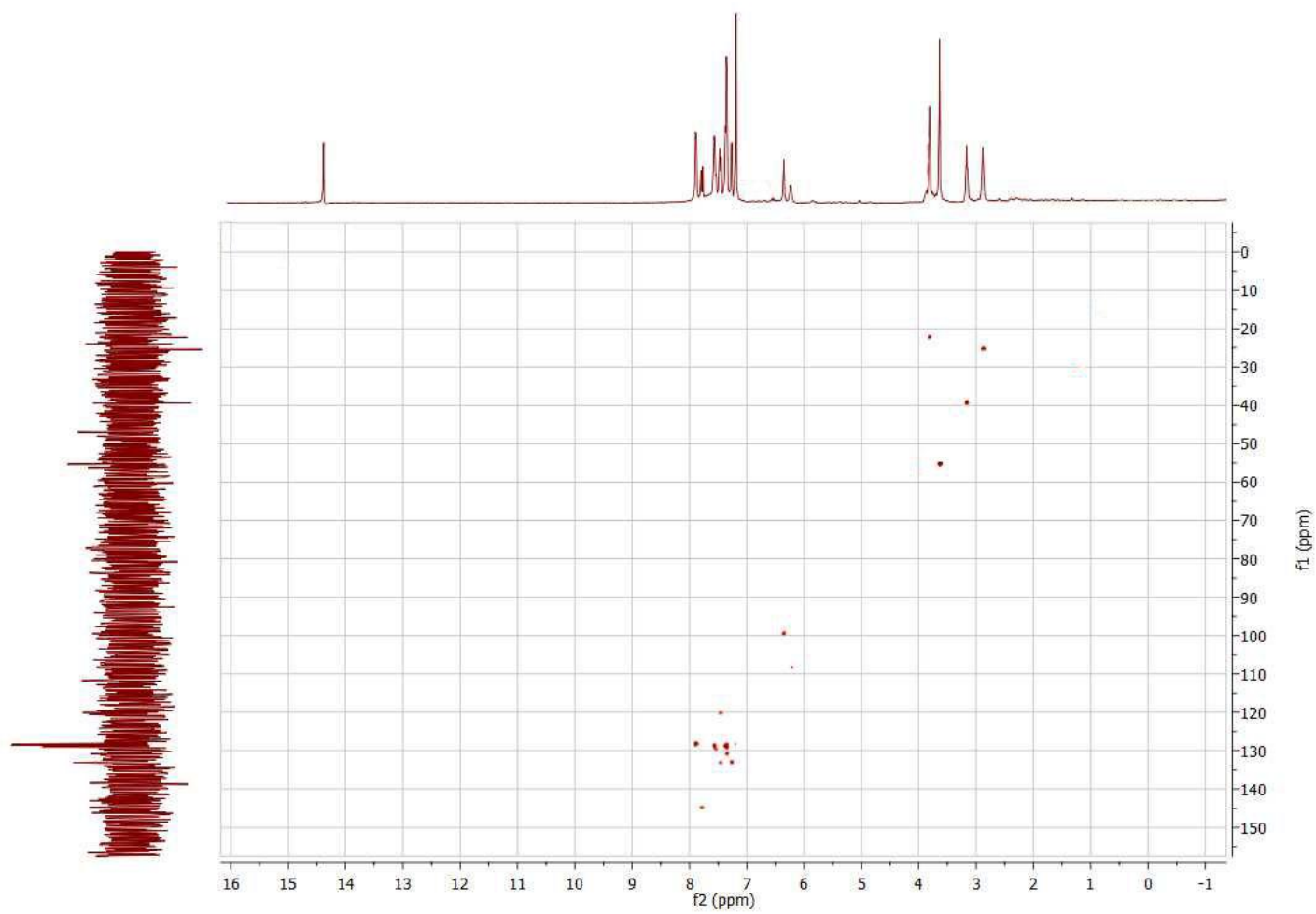


Figure (S.5): HSQC spectrum of dracidione.

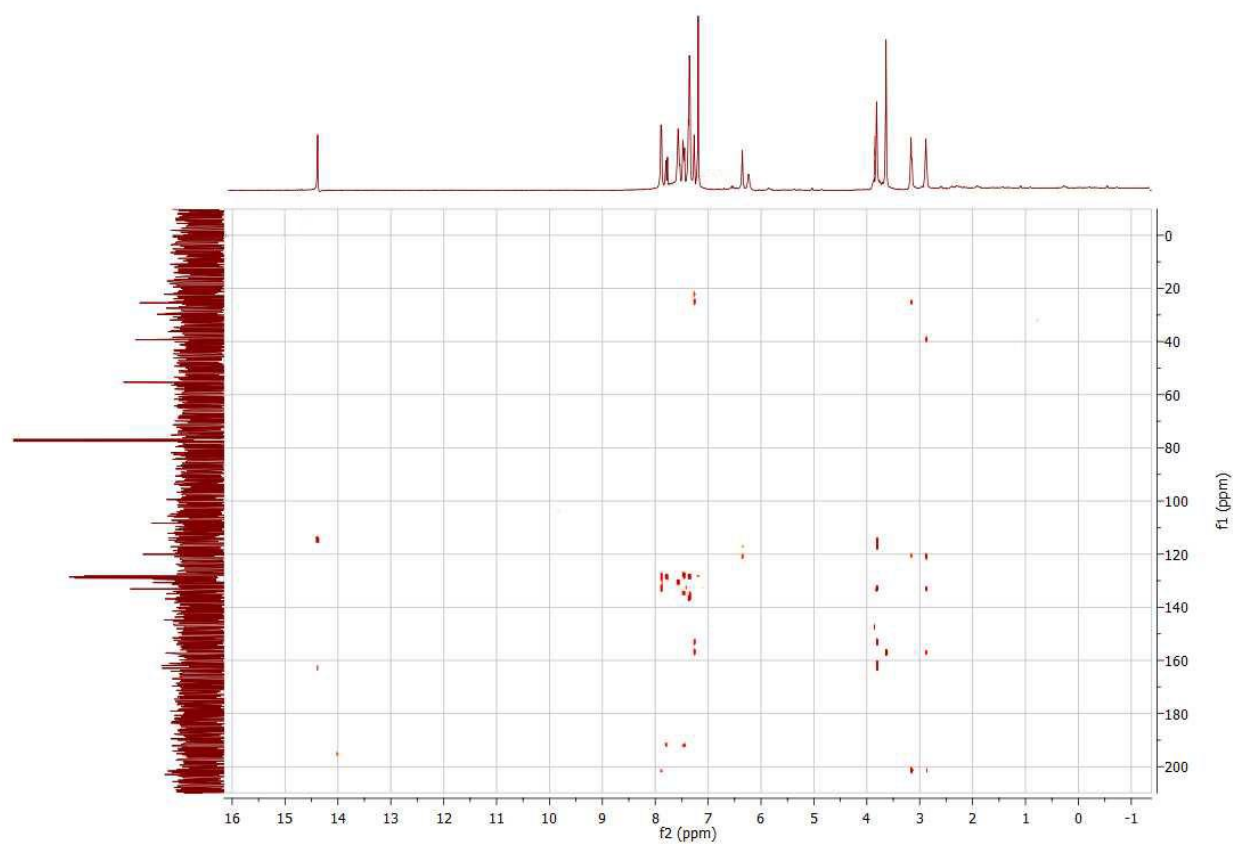
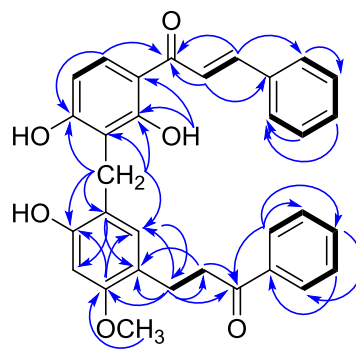


Figure (S.6): HMBC spectrum of dracidione.

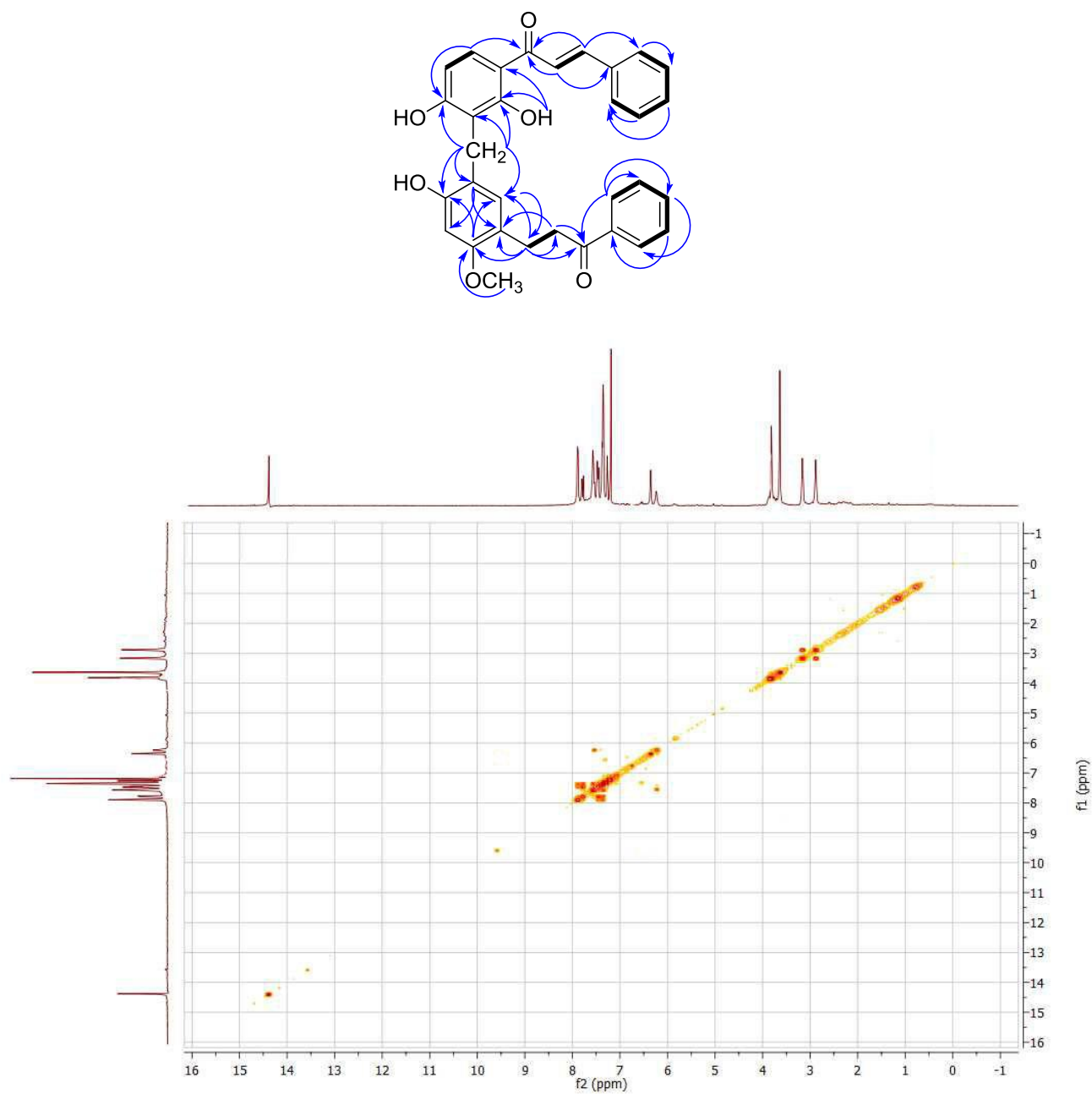


Figure (S.7): COSY spectrum of dracidione.

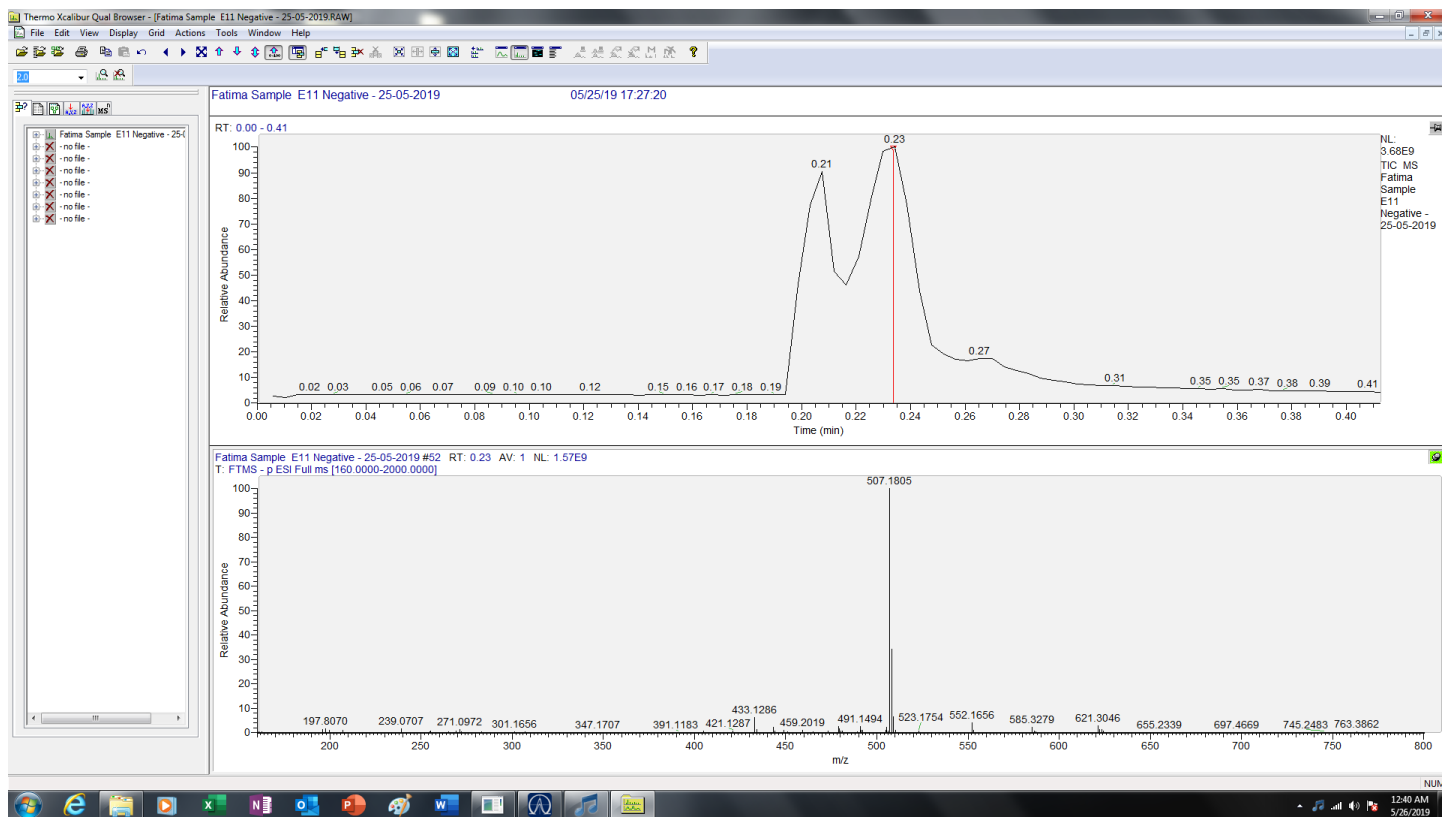


Figure (S.8): Negative-mode HR Mass of dracidione.

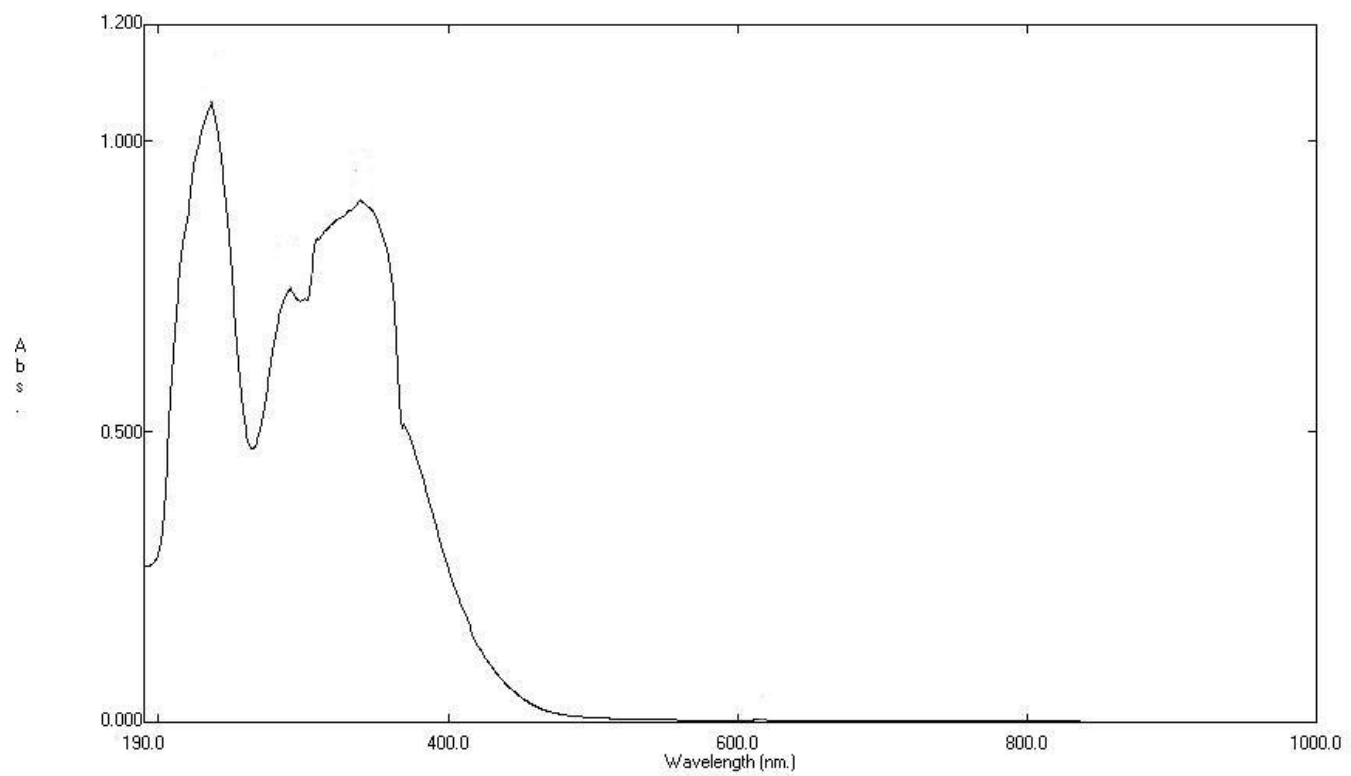


Figure (S.9): UV spectrum of dracidione.

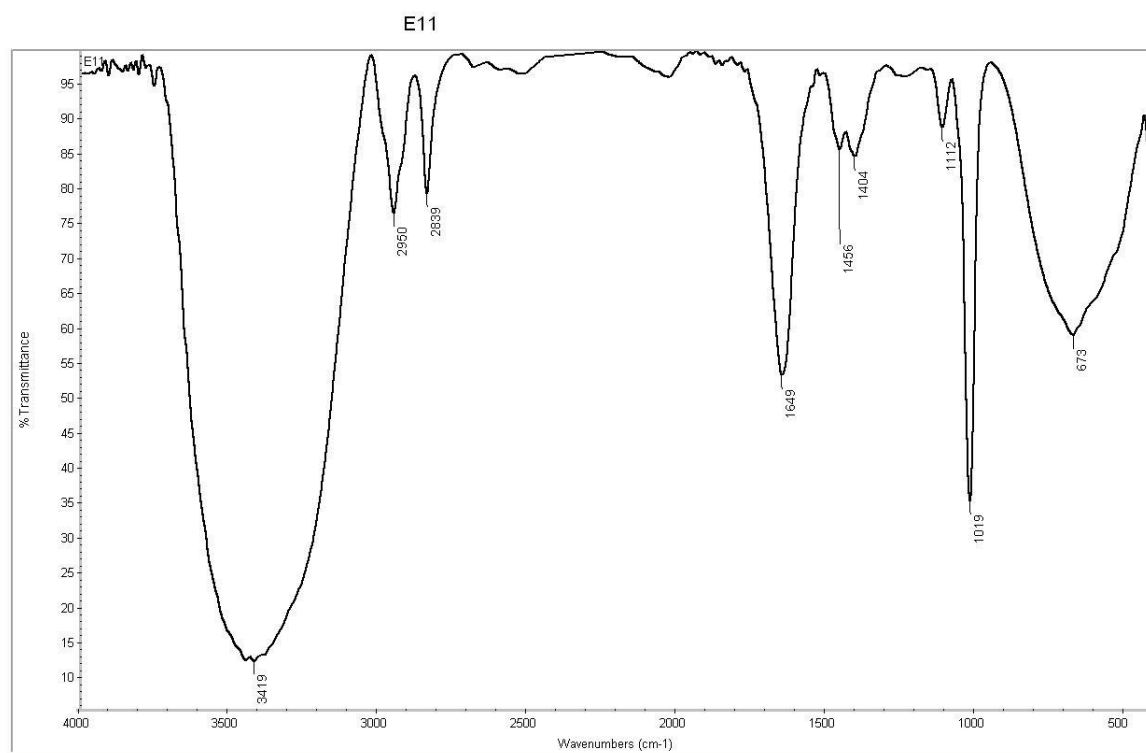


Figure (S.10): IR spectrum of dracidione.

Table S1: ^1H - (500 MHz) and ^{13}C -NMR (125 MHz) data for dracidione in CDCl_3 .

Position	^1H [δ ; mult.; J (Hz)]	^{13}C [δ , type]
1		134.7, C
2/6	7.55-7.57 m	128.6, CH
3/5	7.35-7.37 m	130.7, CH
4	7.21*	128.1, CH
7	7.79 d (15.9)	144.7, CH
8	7.46 d (15.9)	120, CH
9		192, C=O
1'		114.7, C
2'		163.2, C
3'		115.4, C
4'		161.3, C
5'	6.23 bd	108.3, CH
6'	7.54*	129.3, CH
7'	3.82 s	22.4, CH_2
1''		120.2, C
2''		157.2, C
3''	6.35 s	99.5, CH
4''		153.3, C
5''		117, C
6''	7.26 s	132.9, CH
7''	2.88 t (7.3)	25.5, CH_2
8''	3.16 t (7.3)	39.4, CH_2
9''		201.6, C
1'''		136.6, C
2'''/6'''	7.89 d (7.4)	128.2, CH
3'''/5'''	7.35-7.37 m	128.7, CH
4'''	7.45-7.48 m	133, CH
2'-OH	14.38 s	-
2''-OMe	3.64	55.4, CH_3

*Signal is obscured

General experimental procedures

NMR measurements in CDCl_3 were performed on Bruker DRX 500 spectrometer operating at 500 MHz for ^1H - and 125 MHz for ^{13}C -, respectively, using the XWIN NMR software package for the data acquisition and processing. Negative-mode HRMS were recorded on a Finnigan TSQ 7000 and HR-Mass Spectrometer and an UPLC-Quadrupole Orbitrap instruments. Chemical shifts (δ) are expressed in ppm. Chromatographic investigation was performed using silica gel (60-230 mesh, Merck, Germany). Thin-layer chromatography was carried out using Merck precoated silica gel F₂₅₄ aluminum plates (Merck, Germany). α -glucosidase (*Saccharomyces cerevisiae*), acarbose and 3,5-dinitrosalicylic acid (DNS) were purchased from Sigma-Aldrich, Bangalore. *p*-nitrophenyl- α -D-glucopyranoside (*p*NPG), sodium carbonate, sodium dihydrogen phosphate and disodium hydrogen phosphate were purchased from Hi-Media, Egypt.

α -Glucosidase inhibitory assay:

The α -glucosidase inhibitory activity of dracidione was carried out according to the standard method described by (Shai et al. 2011). The reaction was performed in a 96-well plate. Briefly, the reaction mixture consisted of 50 μ l phosphate buffer (100 mM, pH = 6.8), 10 μ l α -glucosidase (1 U/ml), and 20 μ l of varying concentrations of the test compound (1000 to 7.81 μ g/mL) was pre-incubated at 37°C for 15 min. Then, 20 μ l *p*NPG (5 mM) was added as a substrate and further incubated at 37°C for 20 min. The reaction was stopped by adding 50 μ l Na₂CO₃ (0.1 M). The absorbance of the released *p*-nitrophenol was measured at 405 nm using Multiplate Reader. Acarbose at various concentrations (1000 to 7.81 μ g/ml) was used as a standard α -glucosidase inhibitor. The results were expressed as percentage inhibition, calculated using the formula, Inhibitory activity (%) = $(1 - A_s/A_c) \times 100$, where, A_s is the absorbance in the presence of test substance and A_c is the absorbance of control. The IC₅₀ value was defined as the concentration of α -glucosidase inhibitor required to inhibit 50% of the enzyme activity under the assay conditions.