

## Supplementary Materials

Article

# Inhibition of Advanced Glycation End-Products by *Tamarindus indica* and *Mitragyna inermis* Extracts and Effects on Human Hepatocyte and Fibroblast Viability

Relwendé Justin Ouédraogo <sup>1,2,\*</sup>, Umair Aleem <sup>3</sup>, Lassina Ouattara <sup>1,2</sup>, Muhammad Nadeem-ul-Haque <sup>4</sup>, Georges Anicet Ouédraogo <sup>1,2</sup>, Humera Jahan <sup>3,\*</sup> and Farzana Shaheen <sup>4,\*</sup>

<sup>1</sup> Department of Biochemistry-Microbiology, Unit of Training and Research in Life and Earth Sciences, Nazi Boni University, Bobo-Dioulasso 01 BP 1091, Burkina Faso

<sup>2</sup> Laboratory of Research and Teaching in Animal Health and Biotechnology, Nazi Boni University, Bobo-Dioulasso 01 BP 1091, Burkina Faso

<sup>3</sup> Dr. Panjwani Center for Molecular Medicine and Drug Research, International Center for Chemical and Biological Sciences, University of Karachi, Karachi 75270, Pakistan

<sup>4</sup> Third World Center for Science and Technology, Hussain Ebrahim Jamal Research Institute of Chemistry, University of Karachi, Karachi-75270, Pakistan

\* Correspondence: rjustino14@yahoo.com (R.J.O.), jahan\_pcmd@yahoo.com (H.J.); afnan.iccs@gmail.com (F.S.); Tel.: +226-75386260 (R.J.O.); +92-21-111-232-292 (H.J.); +92-331-3859073 (F.S.)

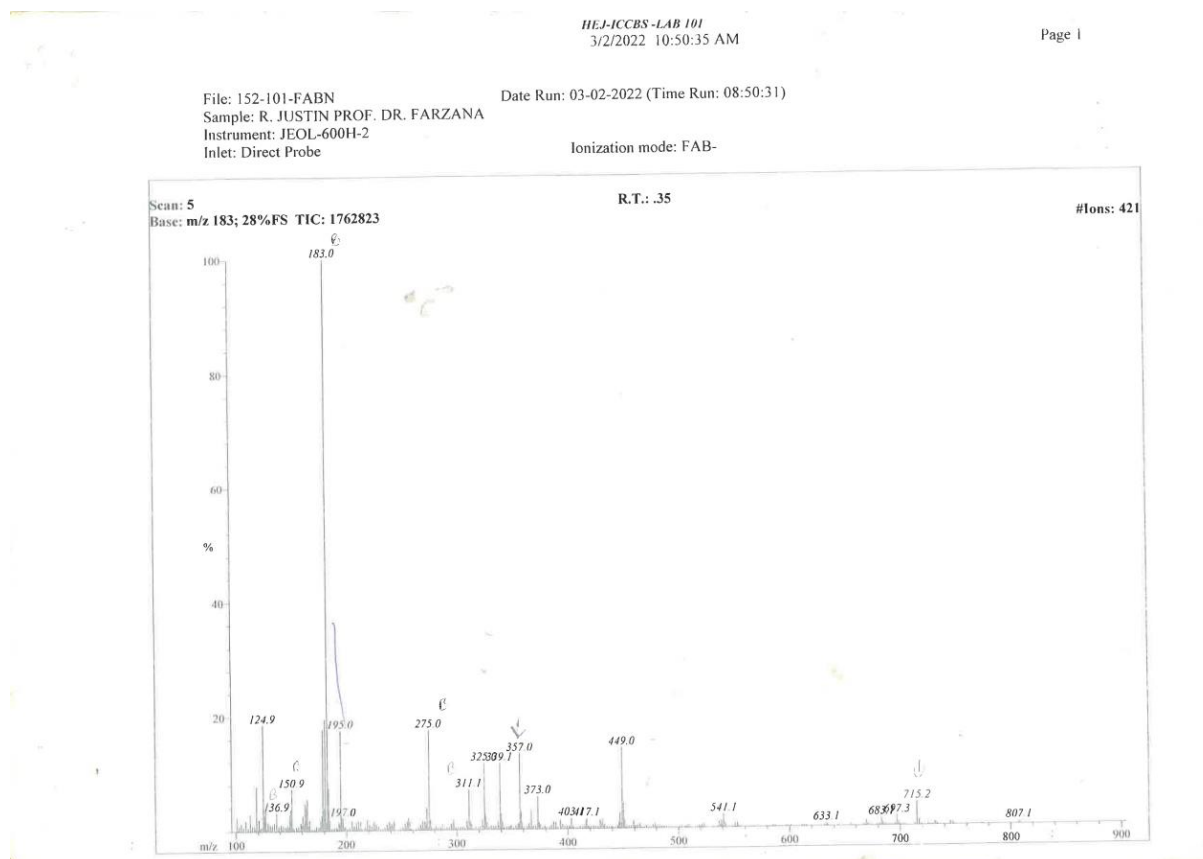


Figure S1: FABMS spectrum of compound 1

HEJ-MASS LAB -ICCBS				JEOL HX 110 MASS SPECTROMETER (FAB-HR)		
STUDENT NAME		R. JUSTIN		SAMPLE CODE	DATE	7/3/2022
SUPERVISOR NAME		DR. FARZANA SHAHEEN		R-152-101	FAB (+VE / -VE)	+VE MODE
Measured Mass	Theoretical Mass	Delta [ppm]	Delta [mmu]	RDB	Composition	
359.1511	359.1495	4.6	1.6	9.5	C20 H23 O6	
359.1511	359.1553	-11.8	-4.2	0.5	C13 H27 O11	
359.1436	359.1436	20.9	7.5	18.5	C27 H19 O1	
357.1355	357.1338	4.7	1.7	10.5	C20 H21 O6	
357.1397	357.1397	-11.7	-4.2	1.5	C13 H25 O11	
357.1279	357.1279	21.2	7.6	19.5	C27 H17 O1	

*Handwritten notes:*  
 $m = 23 - 11 = 12$   
 $n = 23 - 10 = 13$   
 $C_{20}H_{23}O_6$   
 $C_{20}H_{21}O_6$

Figure S2: HRFABMS spectrum of compound 1

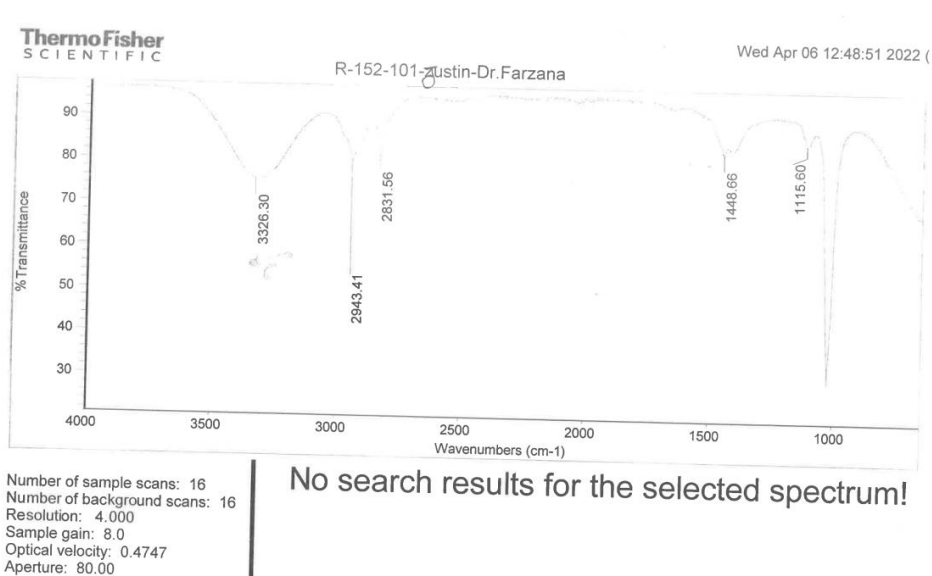
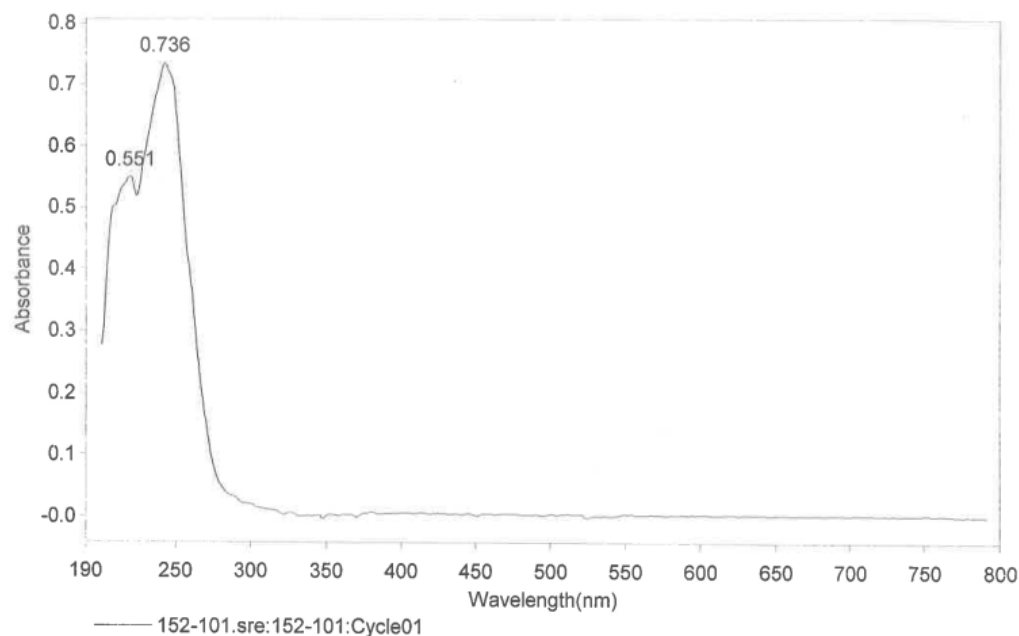


Figure S3 : IR spectrum of compound 1

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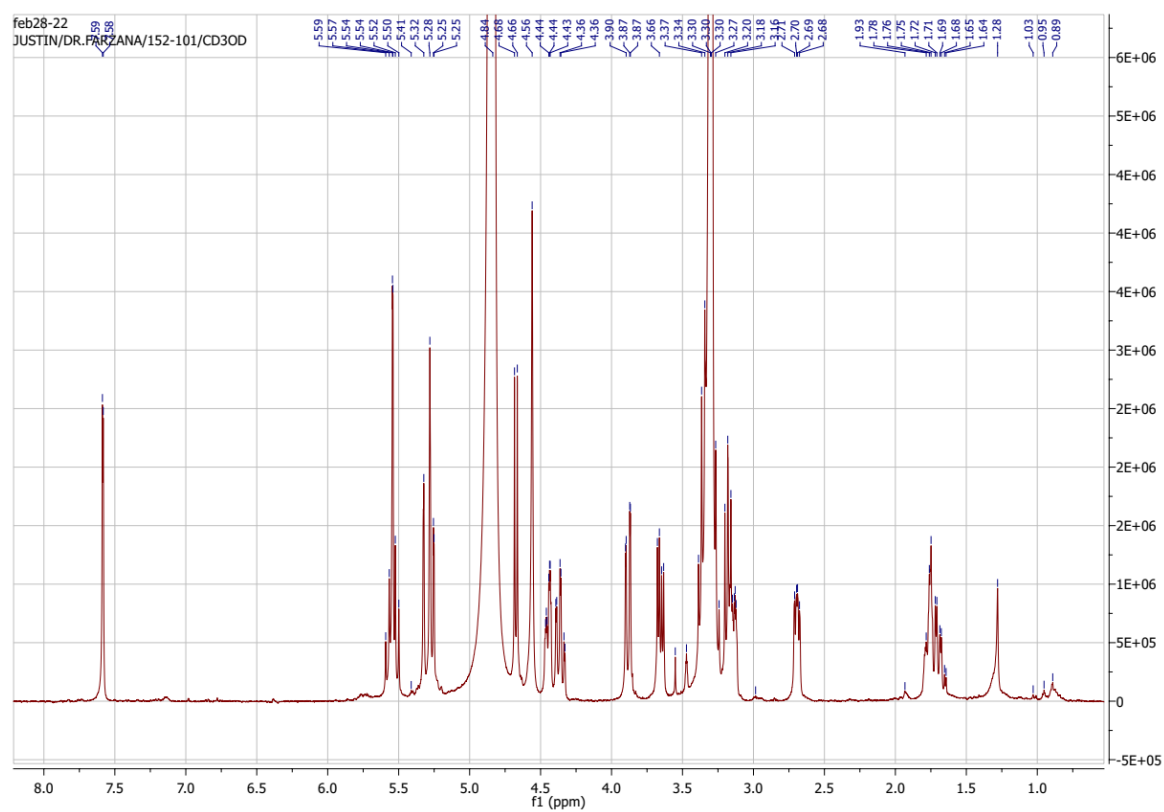
Operator Name Zainab Date of Report 4/7/2022  
 Department Analytical Lab Nanotechnology center Time of Report 11:19:46AM  
 Organization ICCBS, Karachi University  
 Information Justin/Dr.Farzana

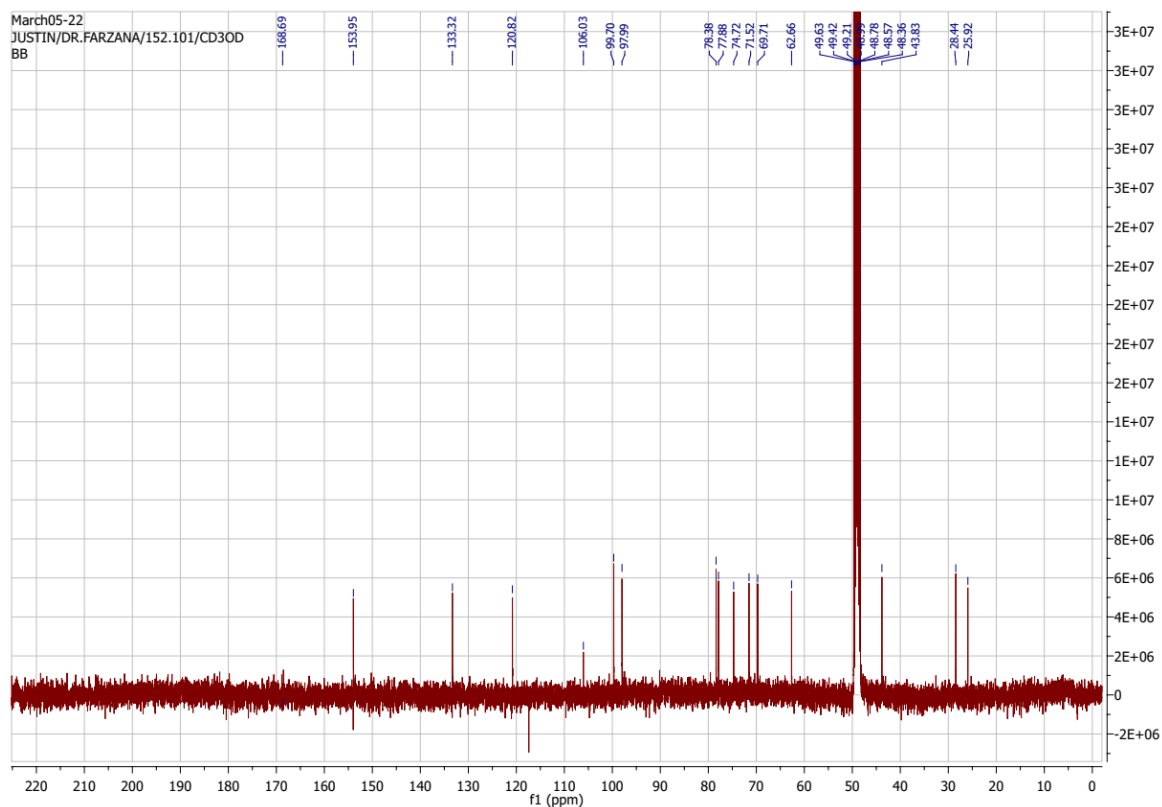
## Scan Graph



## Results Table - 152-101.sre,152-101,Cycle01

nm	A	Peak Pick Method
220.00	0.551	Find 8 Peaks Above -3.0000 A
243.00	0.736	Start Wavelength 190.00 nm
		Stop Wavelength 300.00 nm
		Sort By Wavelength
Sensitivity	Medium	

**Figure S4 :** UV/UV-Visible (MeOH) spectrum of compound **1****Figure S5:**  $^1\text{H}$  NMR (400 MHz,  $\text{CD}_3\text{OD}$ ) spectrum of compound **1**



**Figure S6:**  $^{13}\text{C}$  NMR (101 MHz,  $\text{CD}_3\text{OD}$ ) spectrum of compound 1

HEJ-ICBS-LAB 101  
2/1/2022 10:27:51 AM

Page 1

File: R90-98-FABN Date Run: 02-01-2022 (Time Run: 10:24:26)  
Sample: R. JUSTIN /PROF. DR. FARZANA  
Instrument: JEOL-600H-2  
Inlet: Direct Probe Ionization mode: FAB-

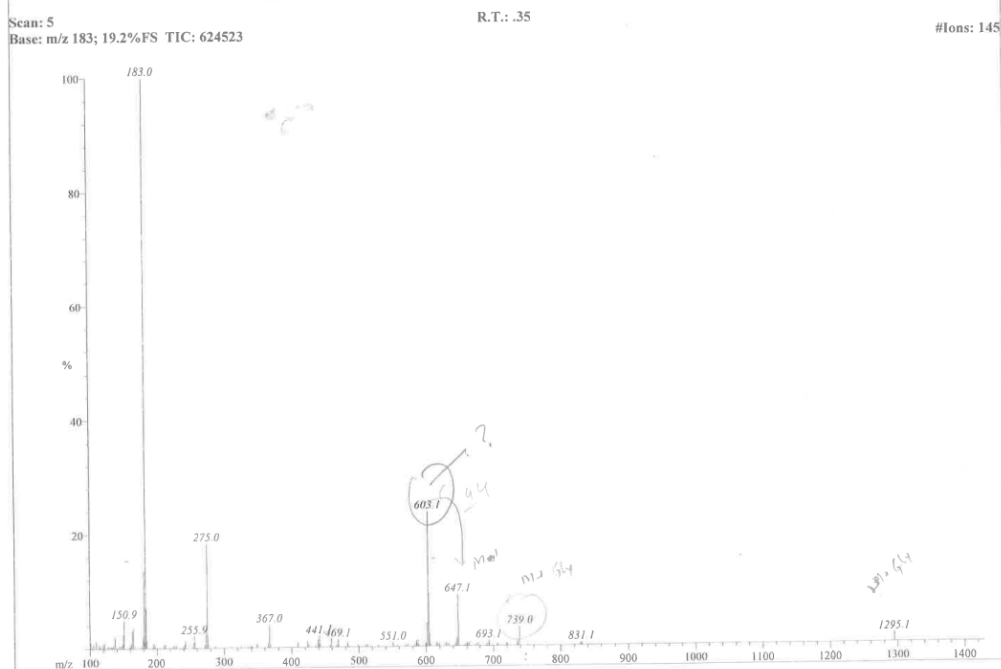


Figure S7: FABMS spectrum of compound 2

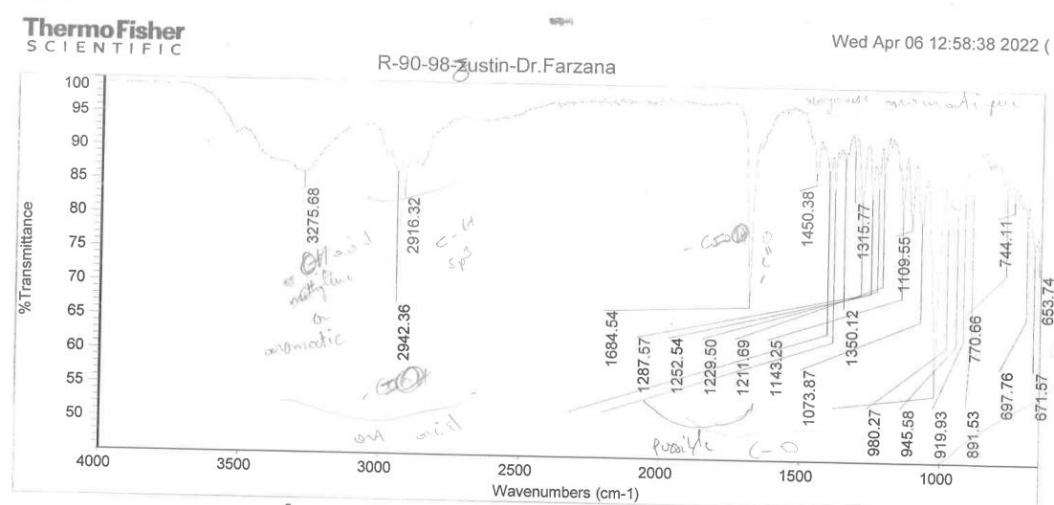
HEJ-MASS LAB -ICCBS			JEOL HX 110 MASS SPECTROMETER (FAB-HR)		
STUDENT NAME	Justin		SAMPLE CODE	DATE	8/4/22
SUPERVISOR NAME	Dr. Farzana Shaheen		R 90-98	FAB (+VE / -VE)	+VE

Mass	Theoretical Mass	Delta [ppm]	Delta [amu]	RDB	Composition
487.3225	487.3212	2.6	1.3	12.5	$C_{33}H_{42}O_3 \rightarrow C_{33}H_{42}O_3$
	487.3271	-9.4	-4.6	3.5	$C_{28}H_{31}O_4$
	487.3365	-28.7	-14.0	16.5	$C_{31}H_{42}O_3$
	487.3060	33.9	16.5	8.5	$C_{30}H_{41}O_3$
649.3739	649.3740	-0.2	-0.1	13.5	$C_{39}H_{52}O_8 \rightarrow C_{39}H_{52}O_8$
	649.3682	8.8	5.7	22.5	$C_{38}H_{51}O_8$
	649.3799	-9.3	-6.0	4.5	$C_{32}H_{41}O_{11}$
	649.3647	14.2	9.2	0.5	$C_{38}H_{51}O_{11}$

$34 - 21 = 13$   
 $40 - 26 = 14$

Figure S8: HRFABMS spectrum of compound 2



Number of sample scans: 16  
 Number of background scans: 16  
 Resolution: 4.000  
 Sample gain: 8.0  
 Optical velocity: 0.4747  
 Aperture: 80.00

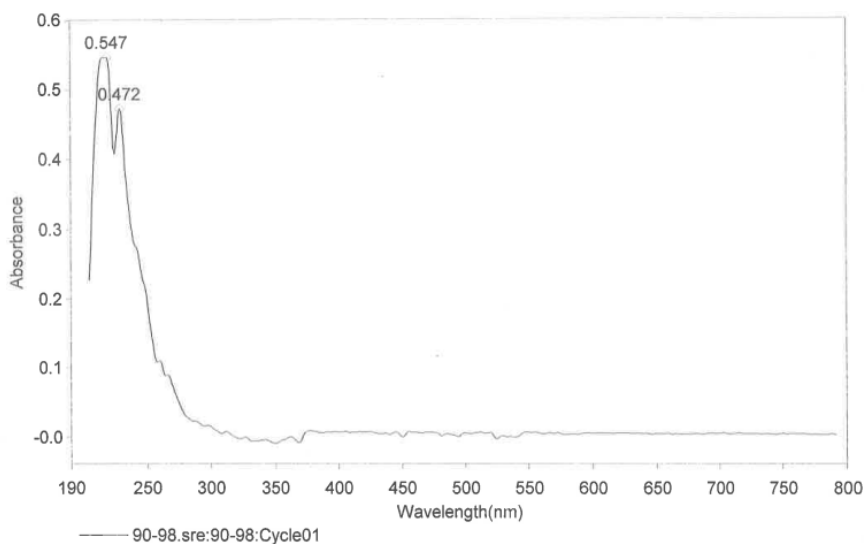
No search results for the selected spectrum!

Figure S9: IR spectrum of compound 2

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Operator Name Zainab Date of Report 4/7/2022  
Department Analytical Lab Nanotechnology center Time of Report 11:17:43AM  
Organization ICCBS, Karachi University  
Information Justin/Dr.Farzana

## Scan Graph



## Results Table - 90-98.sre,90-98,Cycle01

nm	A	Peak Pick Method
219.00	0.547	Find 8 Peaks Above -3.0000 A
229.00	0.472	Start Wavelength190.00 nm
		Stop Wavelength800.00 nm
		Sort By Wavelength

Sensitivity Auto

Figure S10: UV/UV-Visible (MeOH) spectrum of compound 2

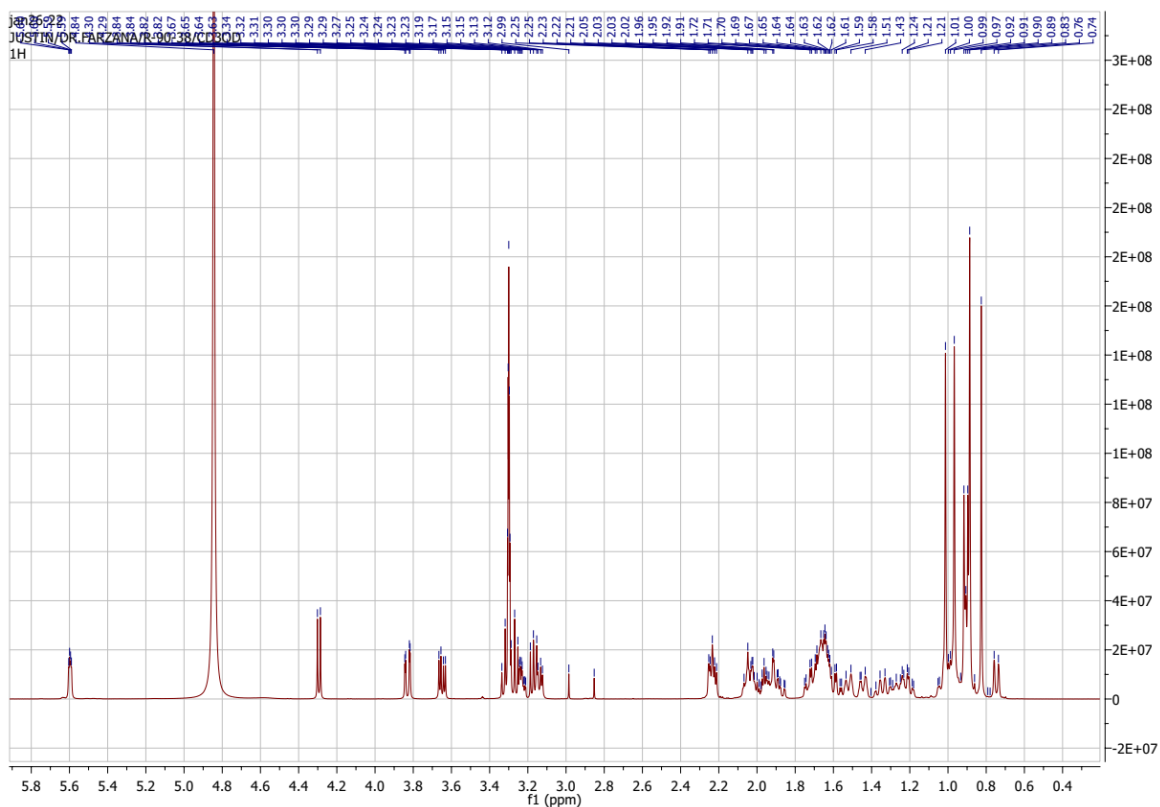
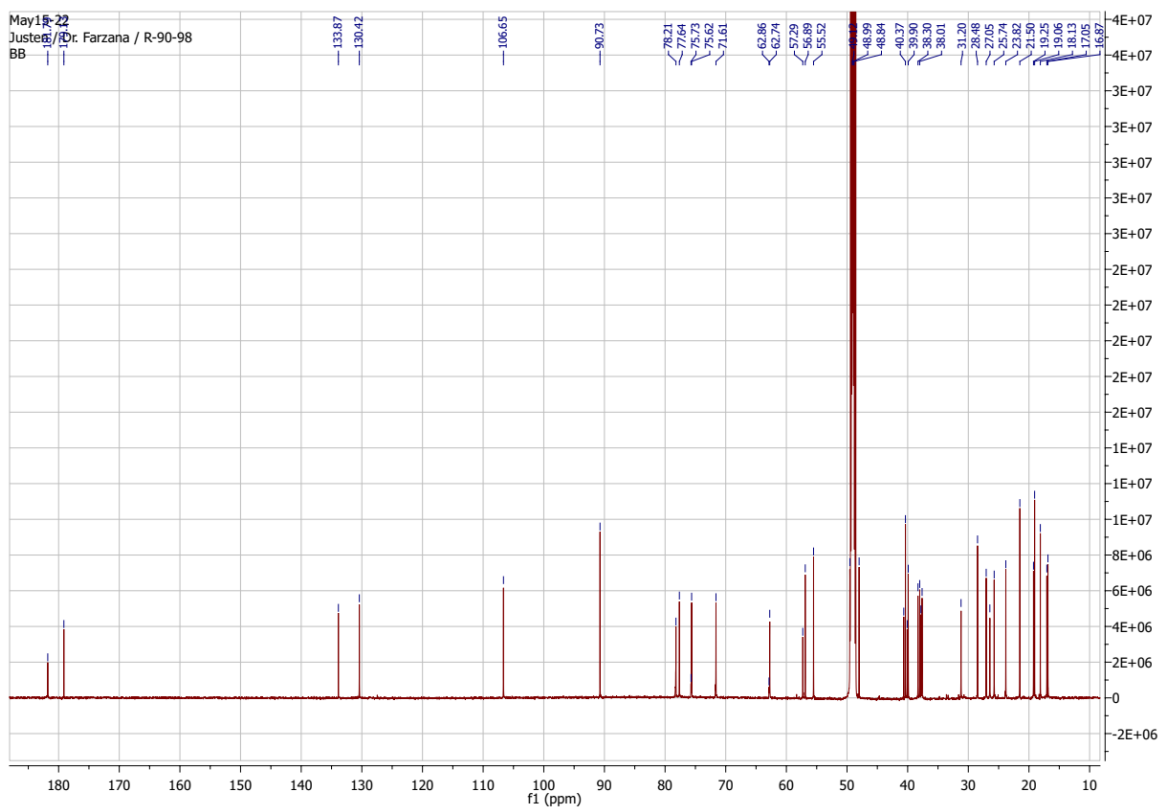
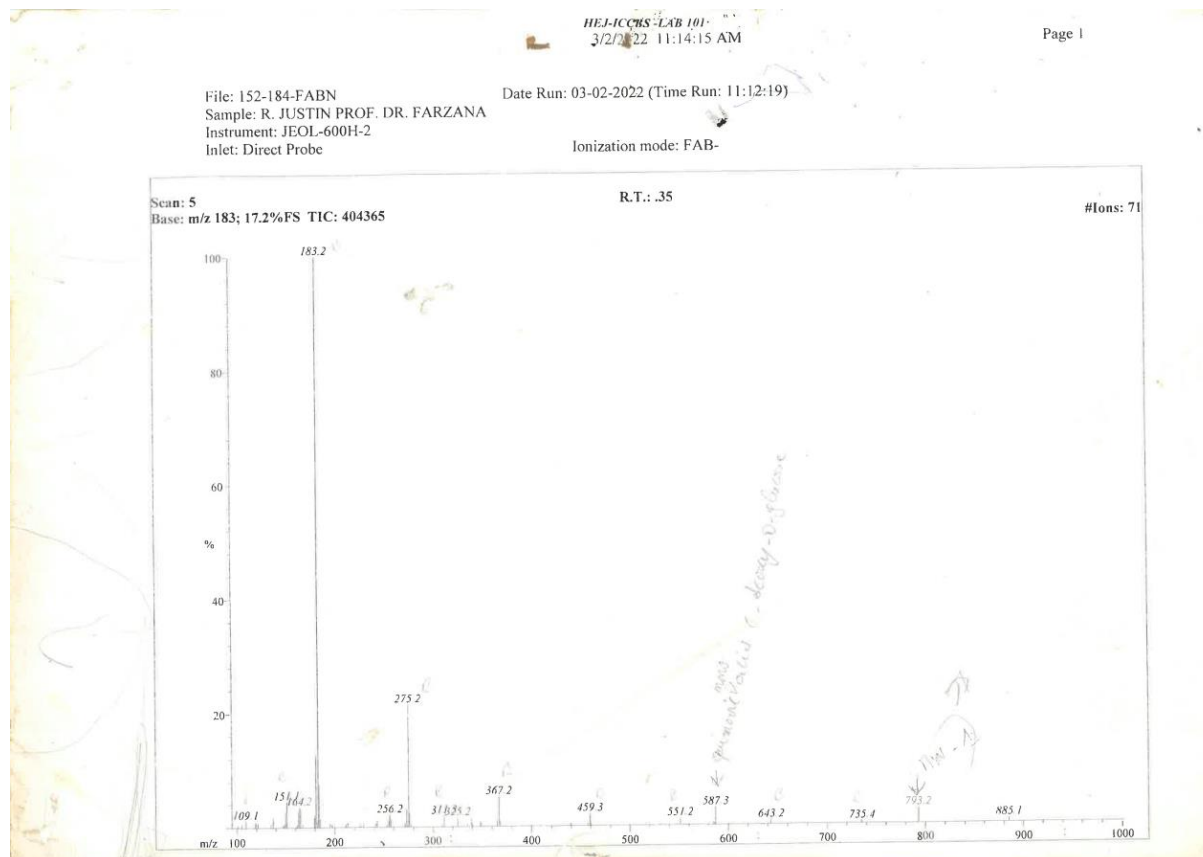


Figure S11: <sup>1</sup>H NMR (500 MHz, CD<sub>3</sub>OD) spectrum of compound 2





**Figure S12:**  $^{13}\text{C}$  NMR (151 MHz,  $\text{CD}_3\text{OD}$ ) spectrum of compound 2**Figure S13:** FABMS spectrum of compound 3

HEJ-MASS LAB -ICCBS				JEOL HX 110 MASS SPECTROMETER (FAB-HR)		
STUDENT NAME	R. JUSTIN			SAMPLE CODE	DATE	7/3/2022
SUPERVISOR NAME	DR. FARZANA SHAHEEN			R-157-184	FAB (+VE / -VE)	+VE MODE
Measured Mass	Theoretical Mass	Delta [ppm]	Delta [mmu]	RDB	Composition	
795.3114	795.311	0.4	0.4	35.5	C56 H43 O5	$C_{56}H_{42}O_5$ $m/z = 57 - 22 = 36$
	795.3075	4.9	3.9	13.5	C38 H51 O18	
	795.3169	-6.9	-5.5	26.5	C49 H47 O10	
	795.3017	12.2	9.7	22.5	C45 H47 O13	
	795.3228	-14.3	-11.4	17.5	C42 H51 O15	$C_{56}H_{40}O_5$ $m/z = 57 - 20 = 37$
793.2958	793.2954	0.5	0.4	36.5	C56 H41 O5	
	793.2919	4.9	3.9	14.5	C38 H49 O18	
	793.3013	-6.9	-5.5	27.5	C49 H45 O10	
	793.286	12.3	9.8	23.5	C45 H45 O13	
	793.3071	-14.3	-11.3	18.5	C42 H49 O15	

**Figure S14:** HRFABMS spectrum of compound 3

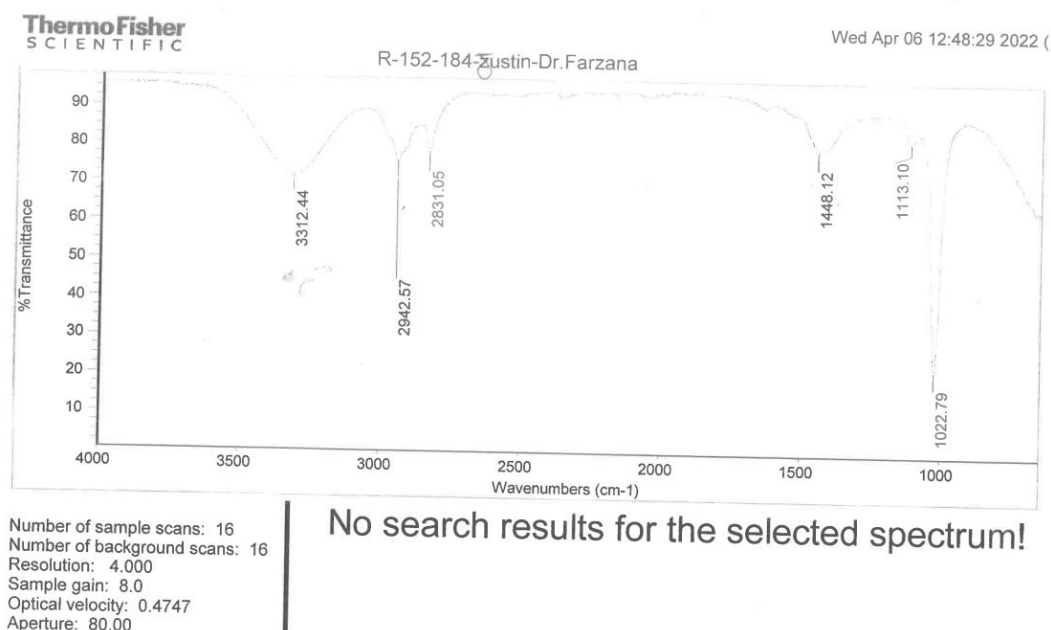
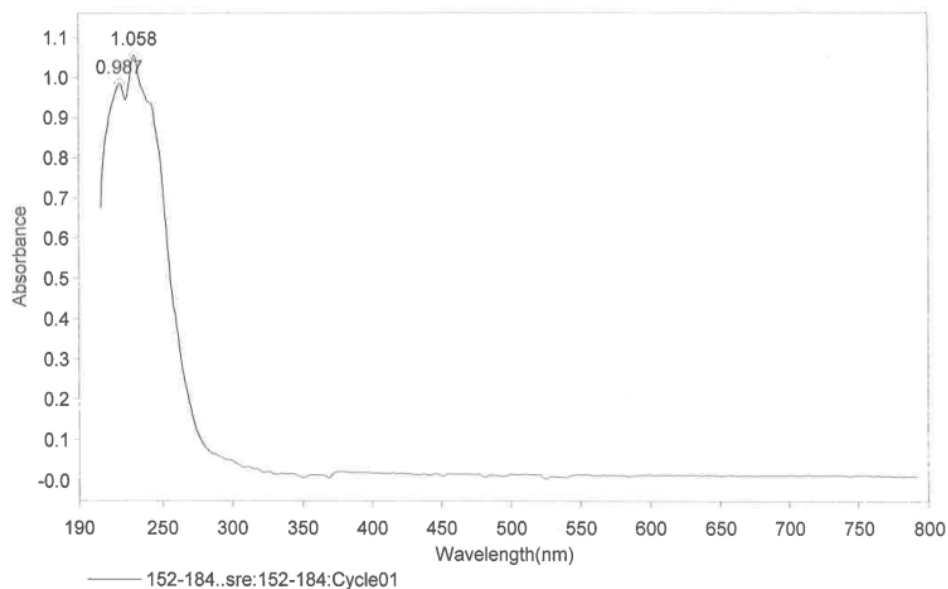


Figure S15: IR spectrum of compound 3

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Operator Name Zainab Date of Report 4/7/2022  
 Department Analytical Lab Nanotechnology center Time of Report 11:17:54AM  
 Organization ICCBS, Karachi University  
 Information Justin/Dr.Farzana

## Scan Graph

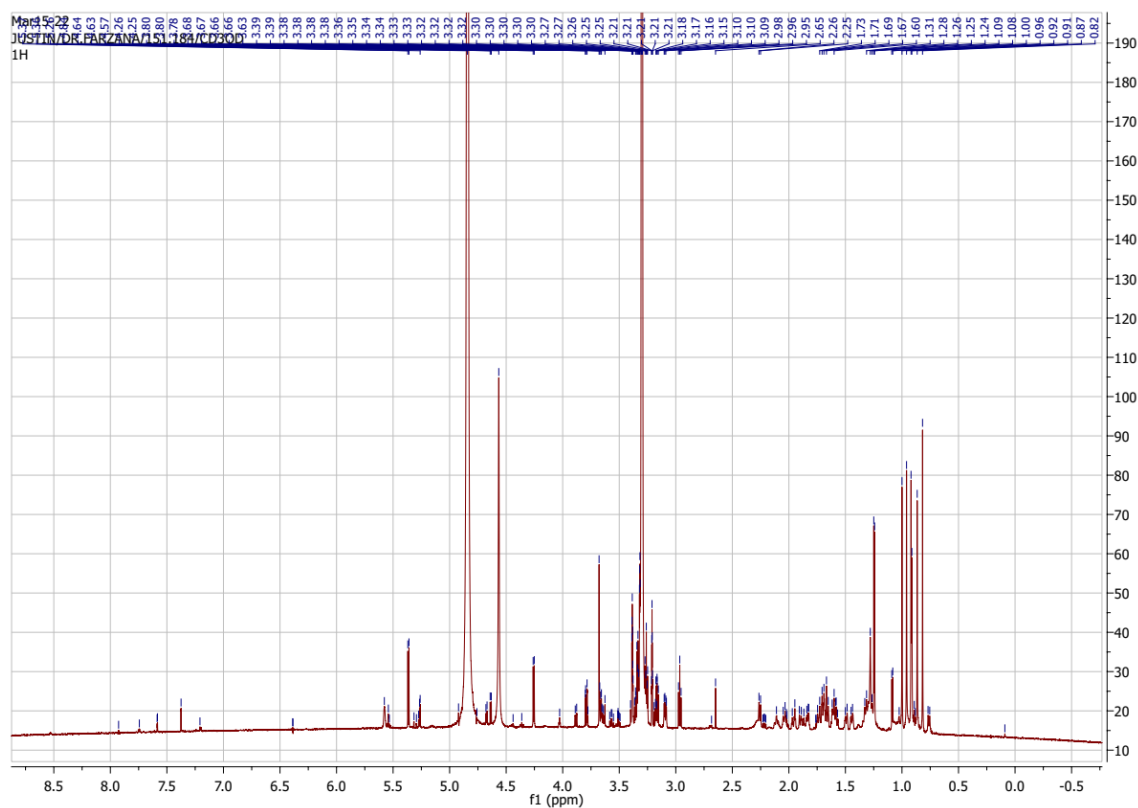
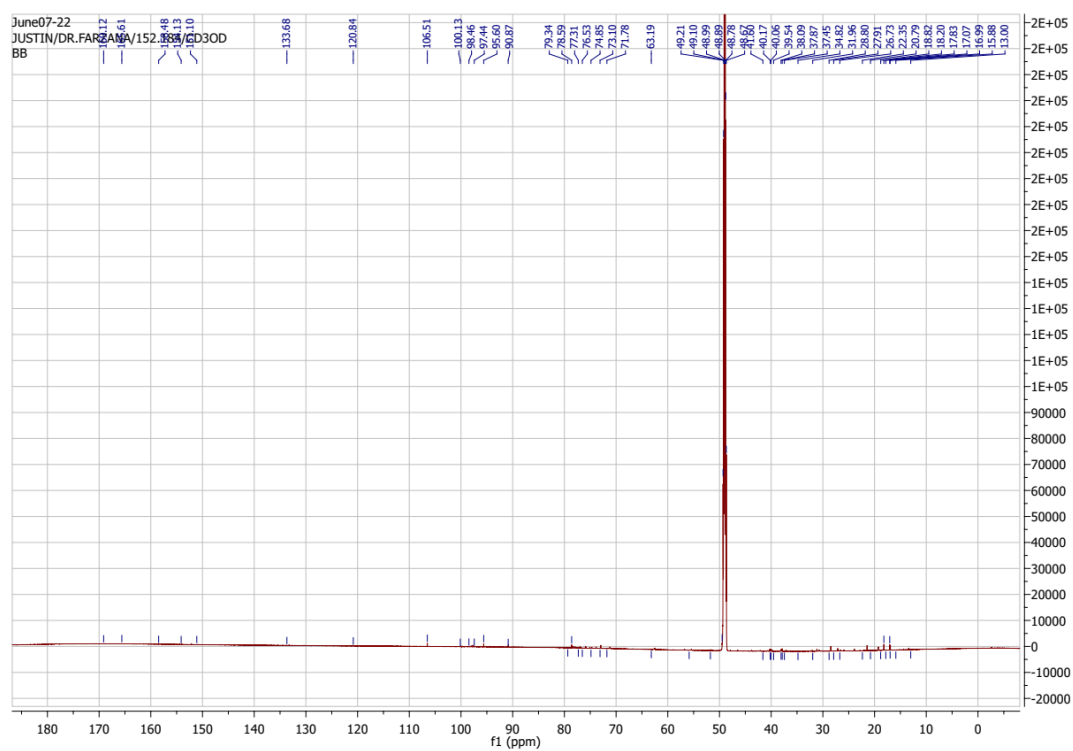


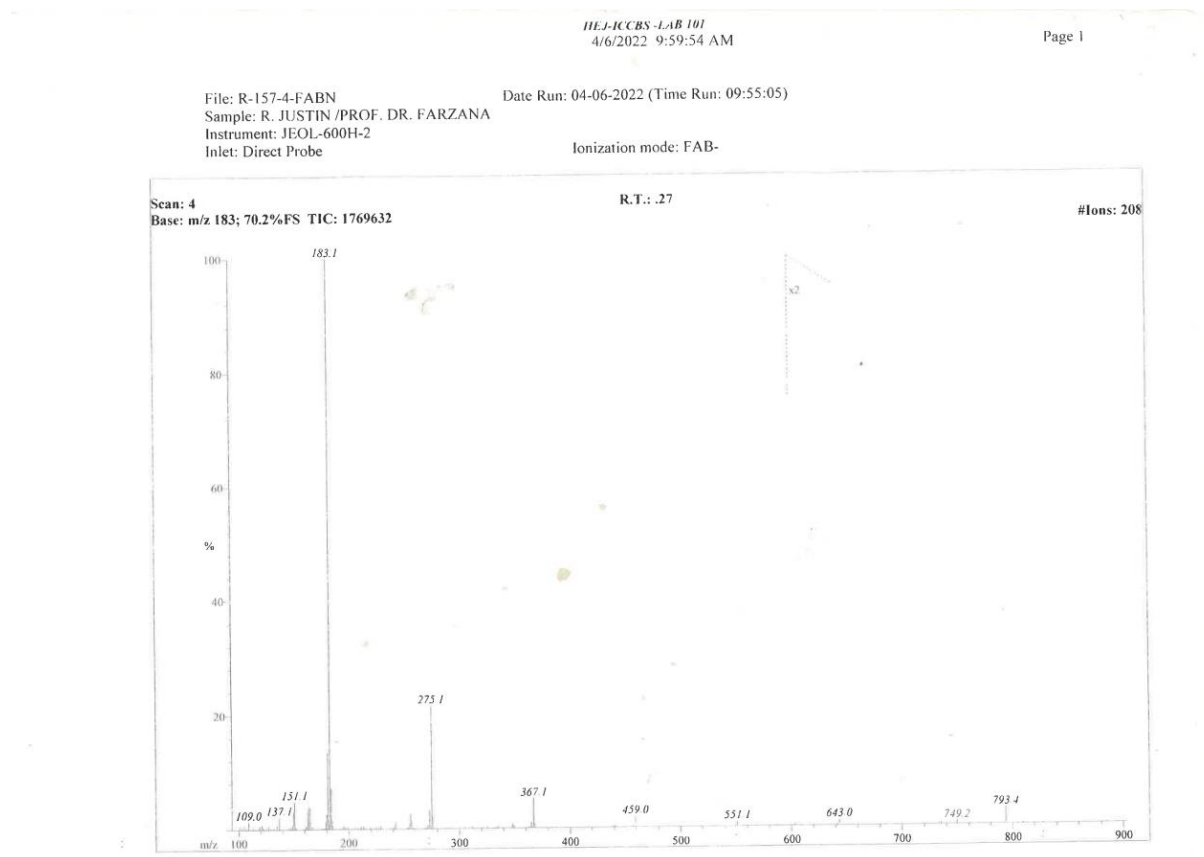
## Results Table - 152-184..sr:152-184,Cycle01

nm	A	Peak Pick Method
220.00	0.987	Find 8 Peaks Above -3.0000 A
230.00	1.058	Start Wavelength 190.00 nm
		Stop Wavelength 800.00 nm
		Sort By Wavelength

Sensitivity Auto

Figure S16: UV/UV-Visible (MeOH) spectrum of compound 3

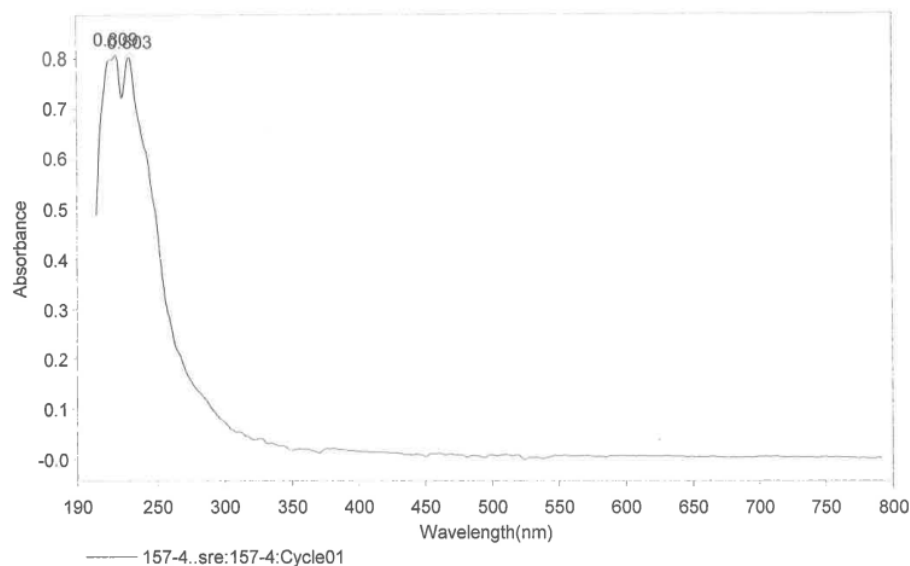
Figure S17: <sup>1</sup>H NMR (400 MHz, CD<sub>3</sub>OD) spectrum of compound 3

**Figure S18:**  $^{13}\text{C}$  NMR (201 MHz,  $\text{CD}_3\text{OD}$ ) spectrum of compound 3**Figure S19:** FABMS spectrum of compound 4

## THERMO ELECTRON ~ VISIONpro SOFTWARE V4.10

Operator Name Zainab Date of Report 4/7/2022  
 Department Analytical Lab Nanotechnology center Time of Report 11:18:07AM  
 Organization ICCBS, Karachi University  
 Information Justin/Dr.Farzana

## Scan Graph



## Results Table - 157-4...sre,157-4,Cycle01

nm	A	Peak Pick Method
220.00	0.809	Find 8 Peaks Above -3.0000 A
230.00	0.803	Start Wavelength 190.00 nm
		Stop Wavelength 800.00 nm
		Sort By Wavelength

Sensitivity Auto

Figure S20: UV/UV-Visible (MeOH) spectrum of compound 4

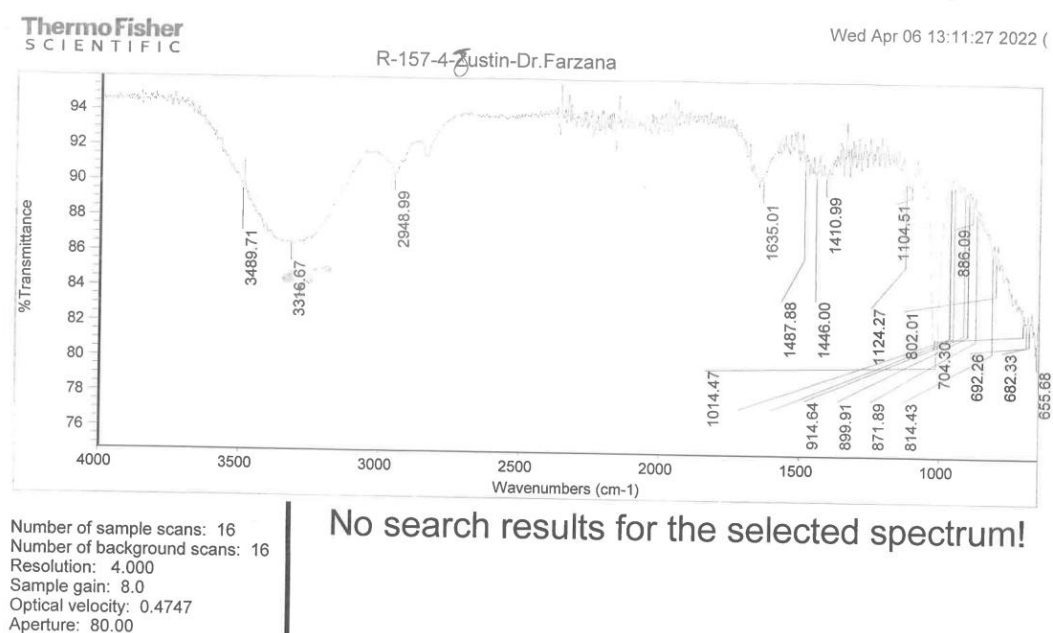
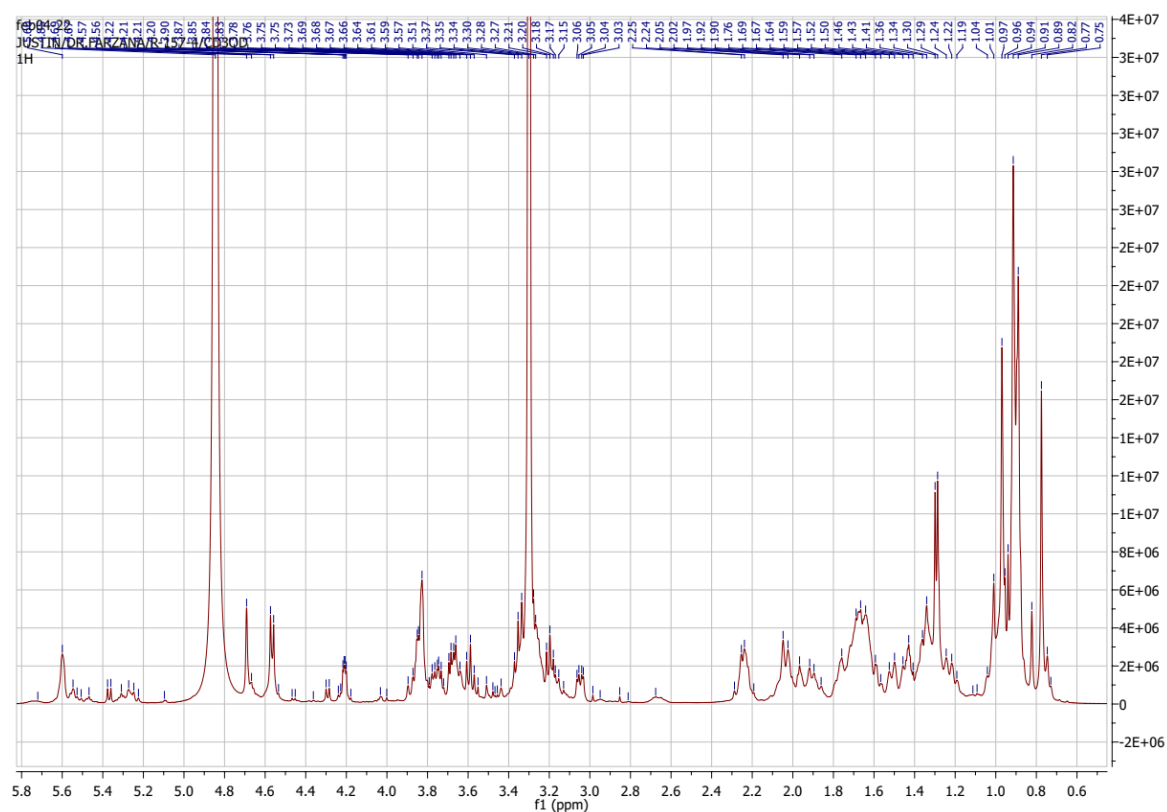
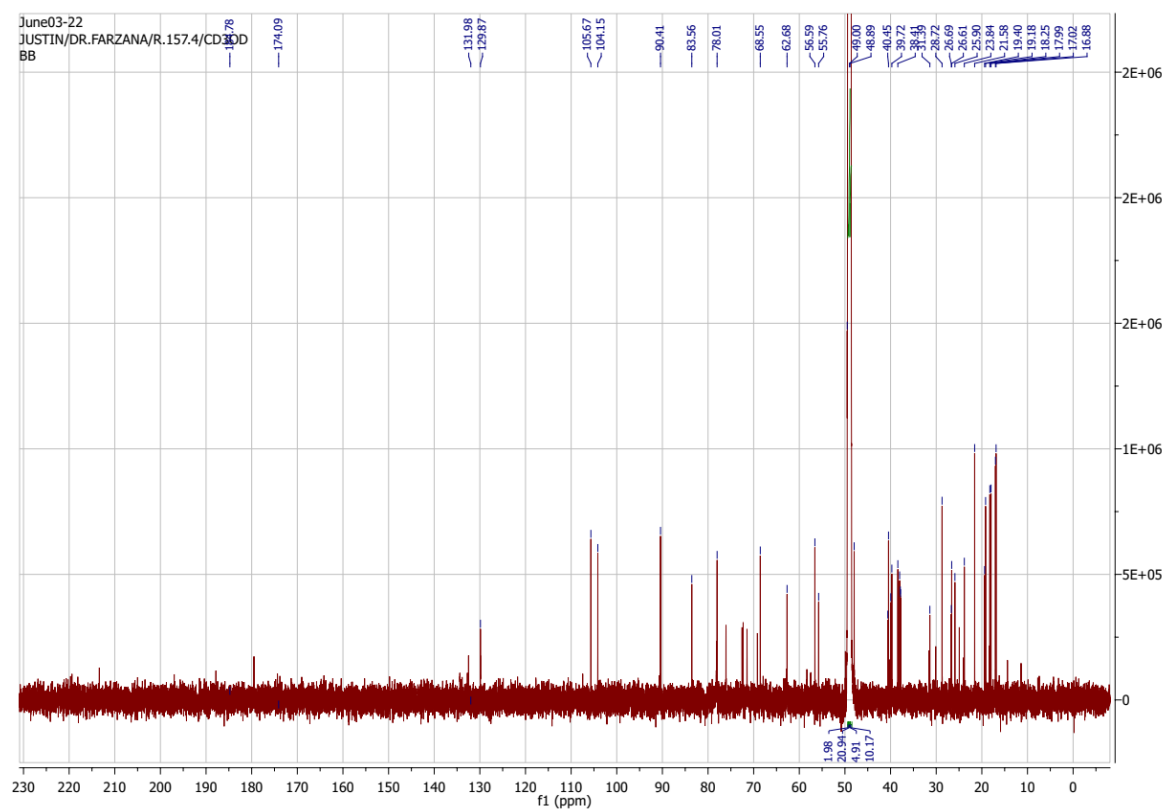


Figure S21: IR spectrum of compound 4

Figure S22: <sup>1</sup>H NMR (500 MHz, CD<sub>3</sub>OD) spectrum of compound 4

**Figure S23:**  $^{13}\text{C}$  NMR (201 MHz,  $\text{CD}_3\text{OD}$ ) spectrum of compound 4**Table S1:** *In-vitro* antiglycation activity fluorescence of *M. inermis* and *T. indica* plants fractions

Parts	Extracts Code	Concentrations	Fluorescence ± SD	% Inhibition ± SD
Blank	BSA-alone	NA	6.93 ± 0.09	NA
AGEs Control	Fructose-BSA	NA	81.30 ± 0.45	NA
Positive Control	Rutin	1 mM	7.53 ± 0.30	91 ± 0.80
M. inermis				
Leaf	Decoction	1mg/mL	13.93 ± 0.51	82.87 ± 0.63
		0.5mg/mL	17.93 ± 0.54	77.94 ± 0.66
		0.25mg/mL	22.88 ± 0.82	71.86 ± 1.01
	Ethyl acetate + Butanol + Acetone	1mg/mL	11.78 ± 0.14	85.50 ± 0.17
		0.5mg/mL	12.76 ± 0.16	84.30 ± 0.20
		0.25mg/mL	14.12 ± 0.08	82.63 ± 0.10
Stem	Ethyl Acetate + Acetone	1mg/mL	25.98 ± 0.63	68.04± 0.78
		0.5mg/mL	26.31 ± 0.88	67.64± 1.09
		0.25mg/mL	33.46 ± 4.74	61.95± 2.07
Root	Ethyl Acetate + Acetone	1mg/mL	25.73 ± 0.38	68.34± 0.47
		0.5mg/mL	28.67 ± 0.24	64.74± 0.29
		0.25mg/mL	37.41 ± 0.47	53.99± 0.58
T. indica				
Leaf	Ethyl Acetate + Butanol	1mg/mL	12.21 ± 0.21	84.97 ± 0.26
		0.5mg/mL	14.97 ± 0.61	81.59 ± 0.75
		0.25mg/mL	20.51 ± 0.65	74.77 ± 0.80
	Acetone	1mg/mL	8.41 ± 0.19	89.66 ± 0.23
		0.5mg/mL	9.98 ± 0.44	87.72 ± 0.55
		0.25mg/mL	15.29 ± 1.21	81.19 ± 1.49
Stem	Ethyl Acetate + Acetone	1mg/mL	6.65 ± 0.17	91.82± 0.21
		0.5mg/mL	7.64 ± 0.23	90.60± 0.28
		0.25mg/mL	9.65 ± 0.18	88.12± 0.23
Root	Ethyl Acetate + Acetone	1mg/mL	8.91 ± 0.21	89.03± 0.25
		0.5mg/mL	10.11 ± 0.01	87.56± 0.001
		0.25mg/mL	11.82 ± 0.37	85.45± 0.46