Supplementary materials

Identification of differential compositions of aqueous extracts of Cinnamomi ramulus and Cinnamomi cortex

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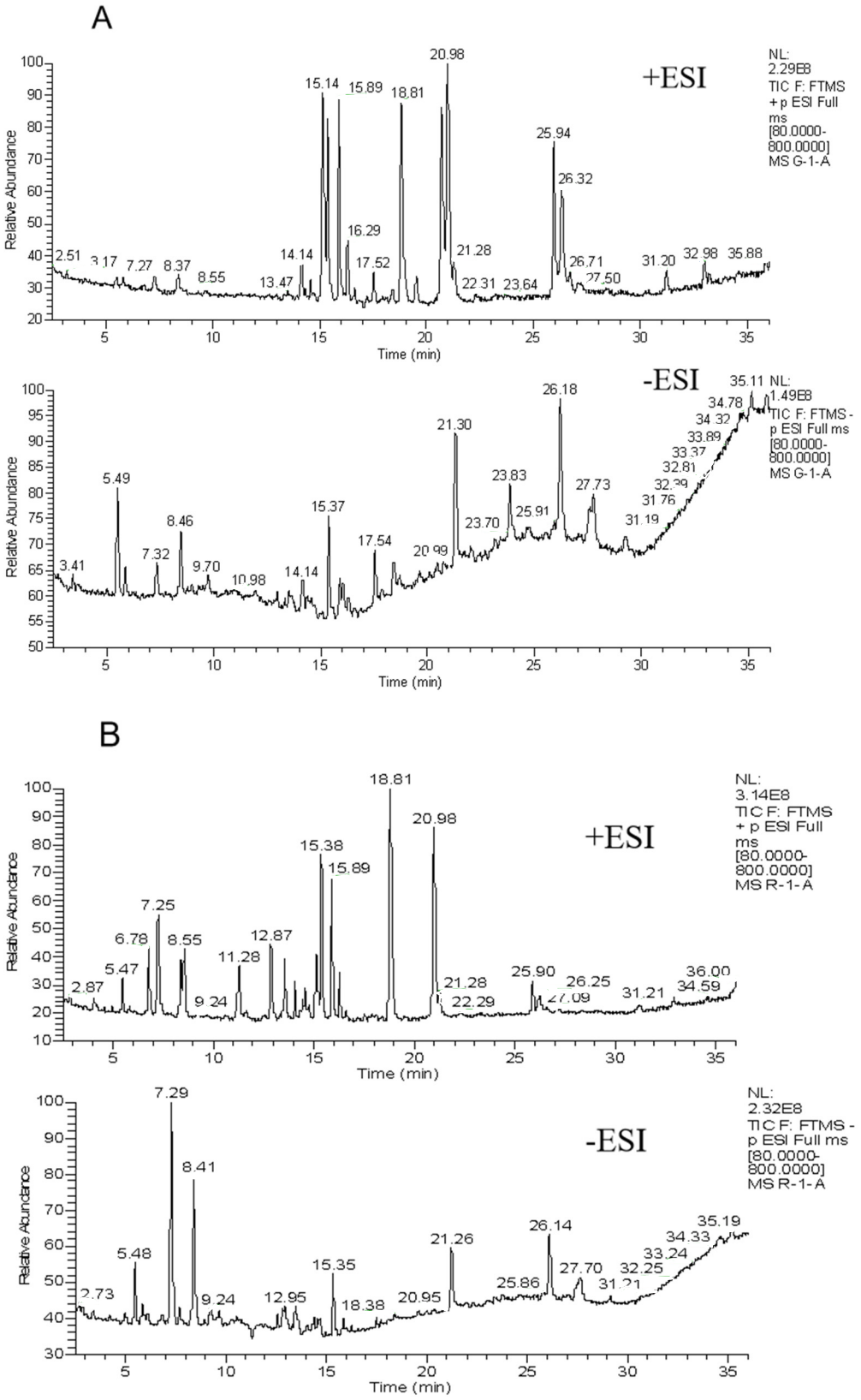
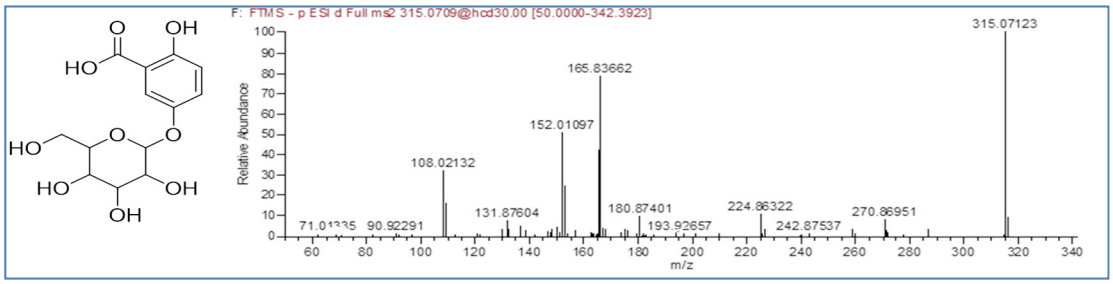


Figure S1. Typical total ion chromatograms (TIC) of CR (A) and CC (B) in both positive and negative ion modes.

Figure S2. Mass spectra and structural formulas of all detected compounds.

Compound **1**



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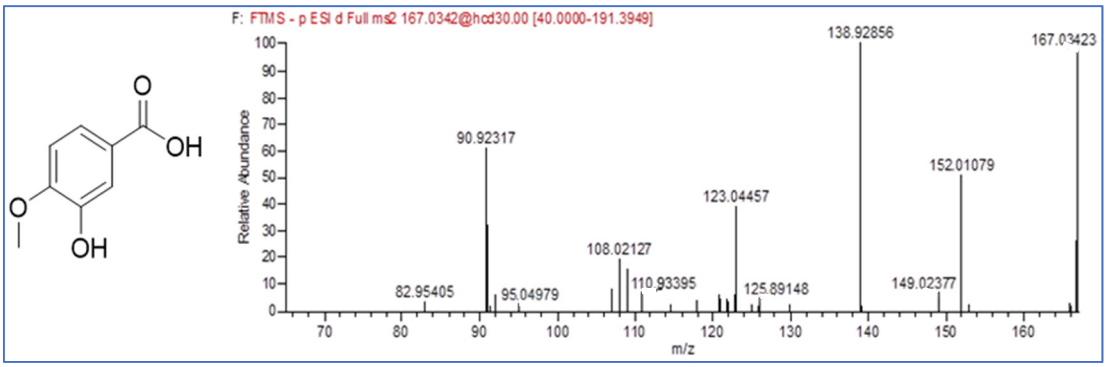

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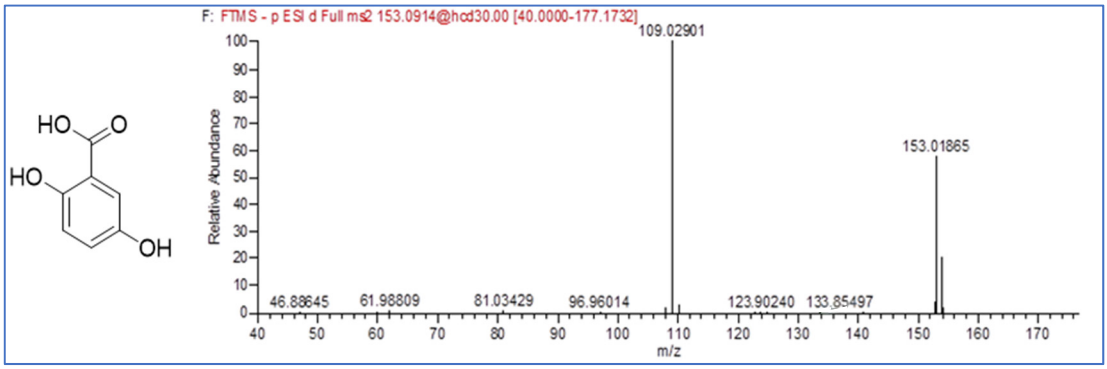

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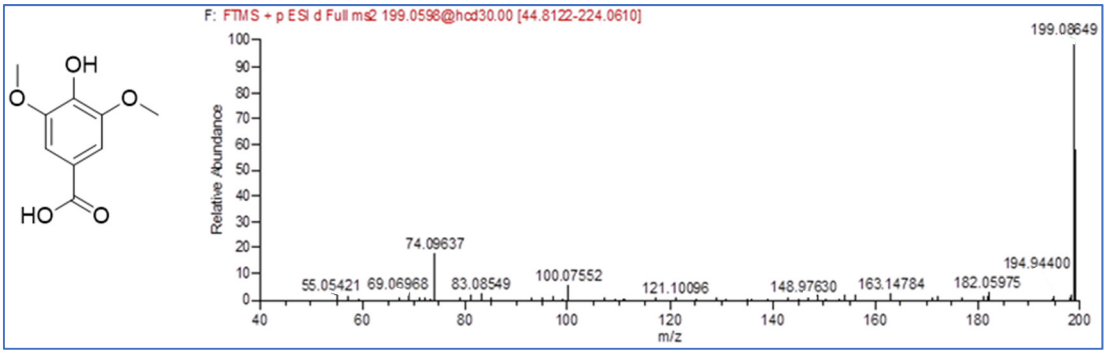

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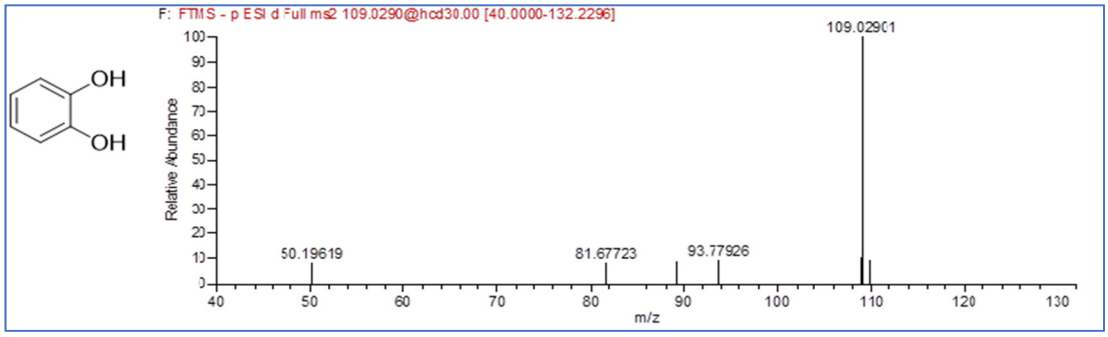

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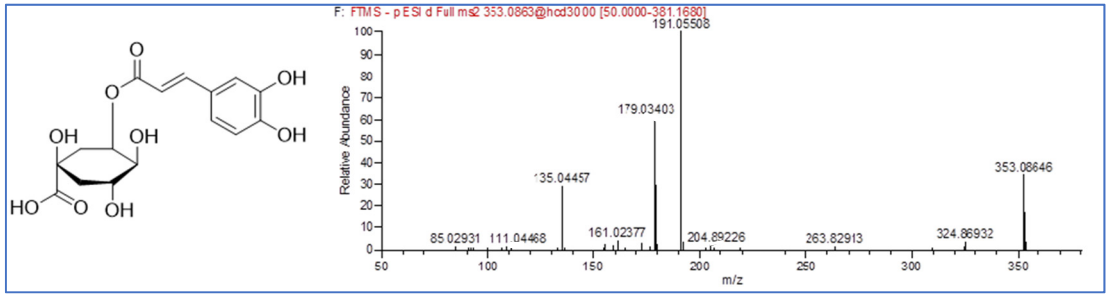

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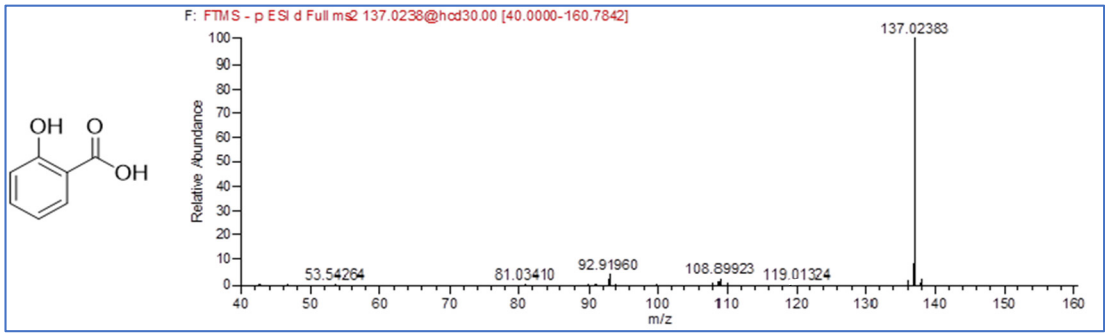

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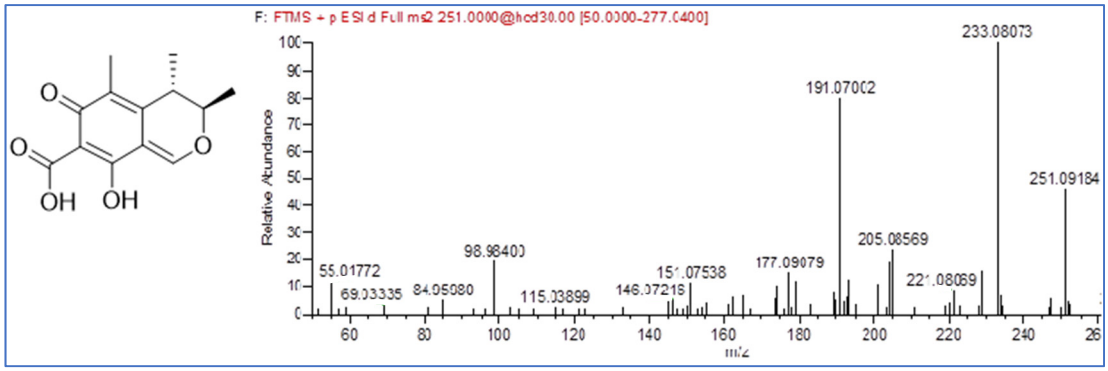

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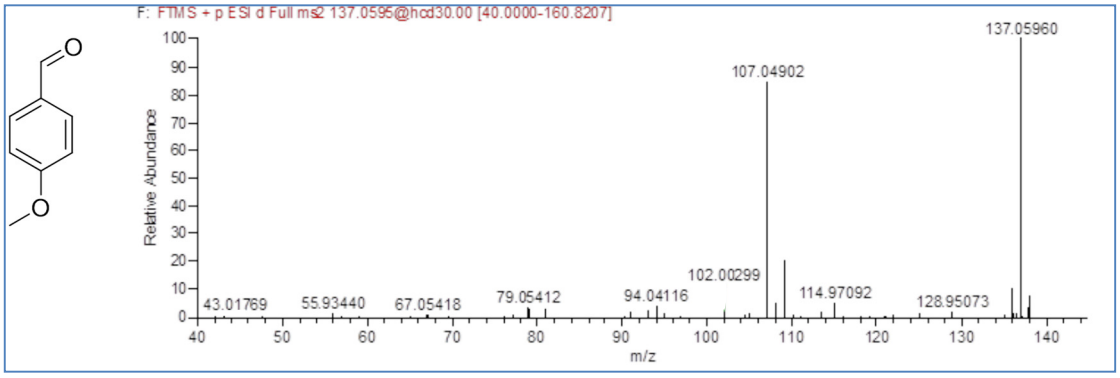

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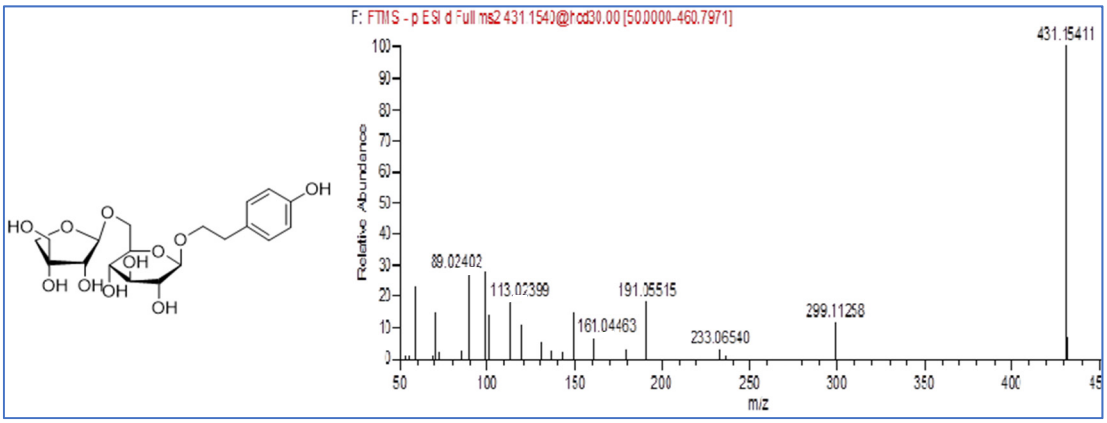

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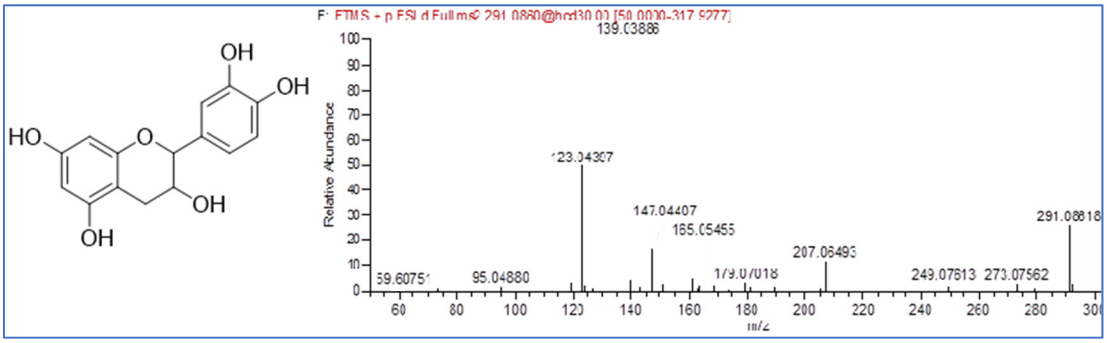

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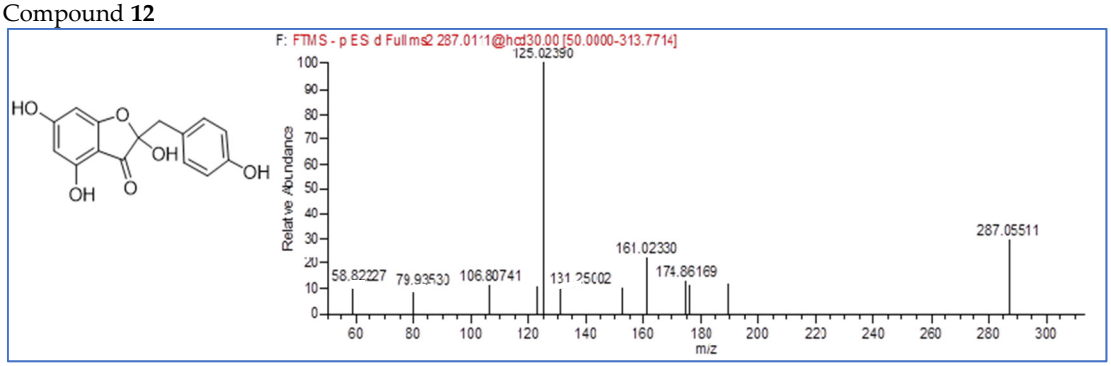

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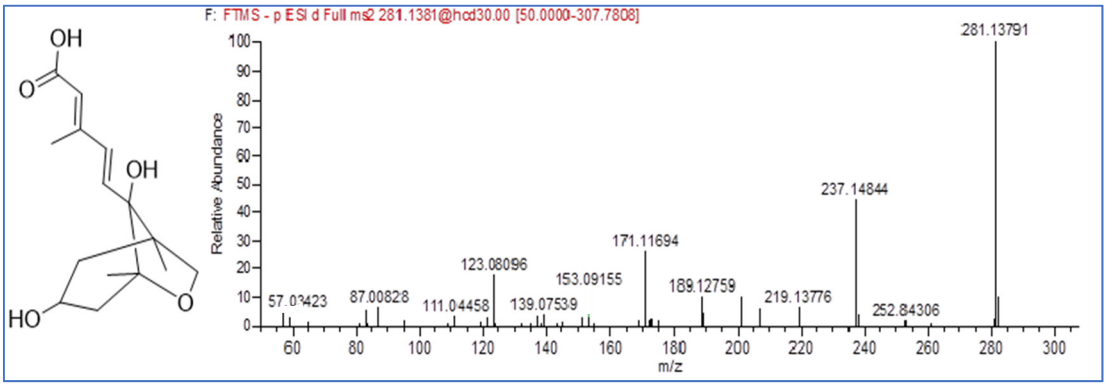

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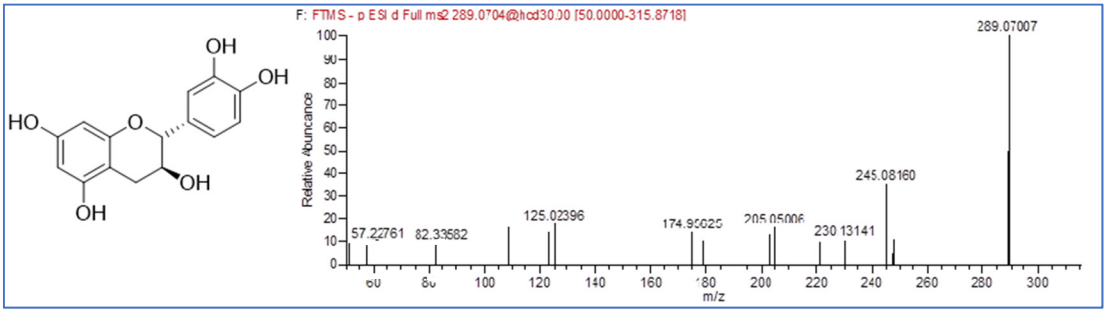

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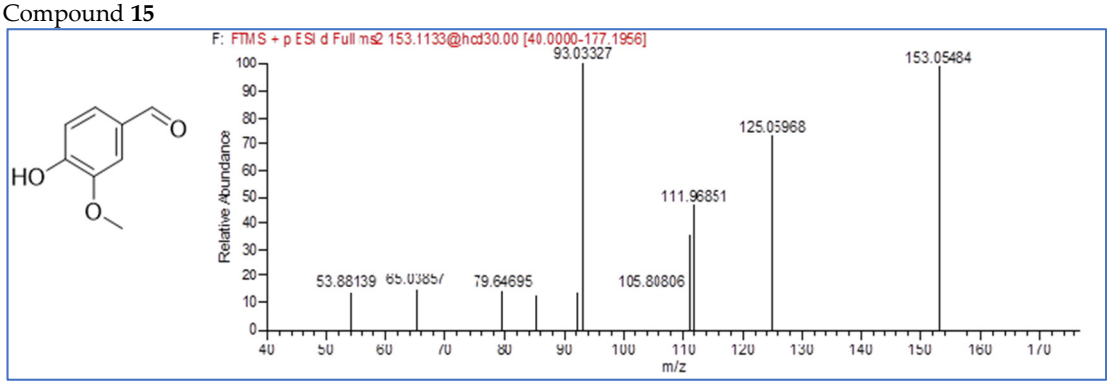

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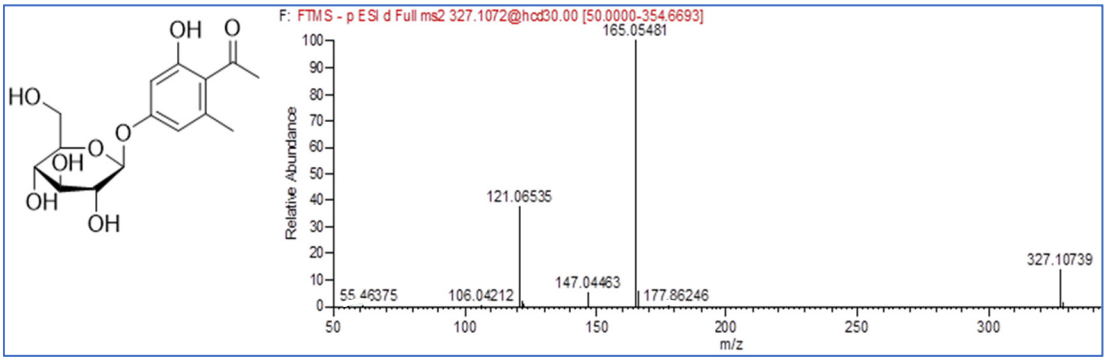

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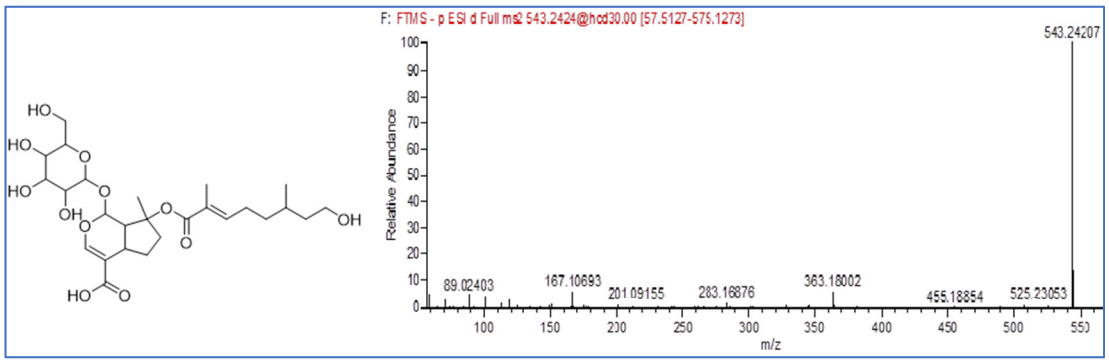

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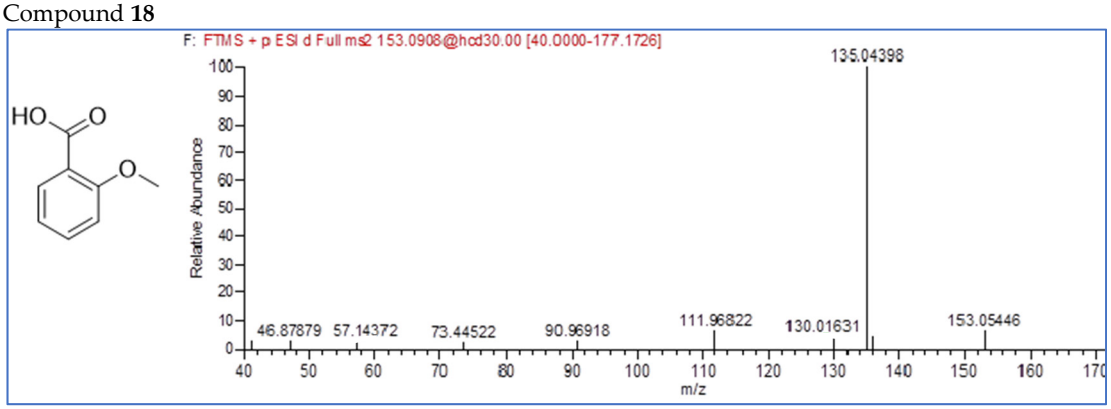

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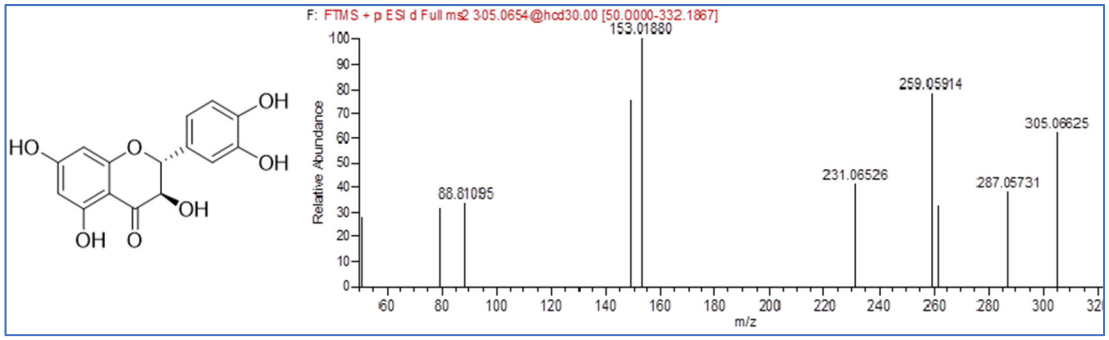

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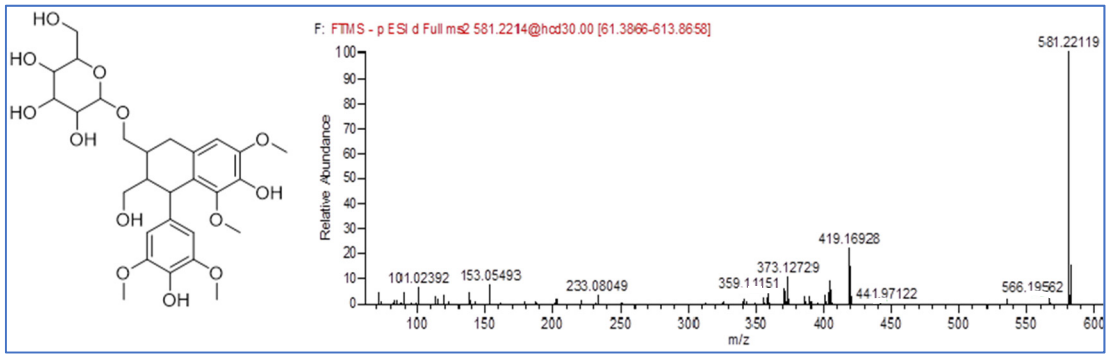

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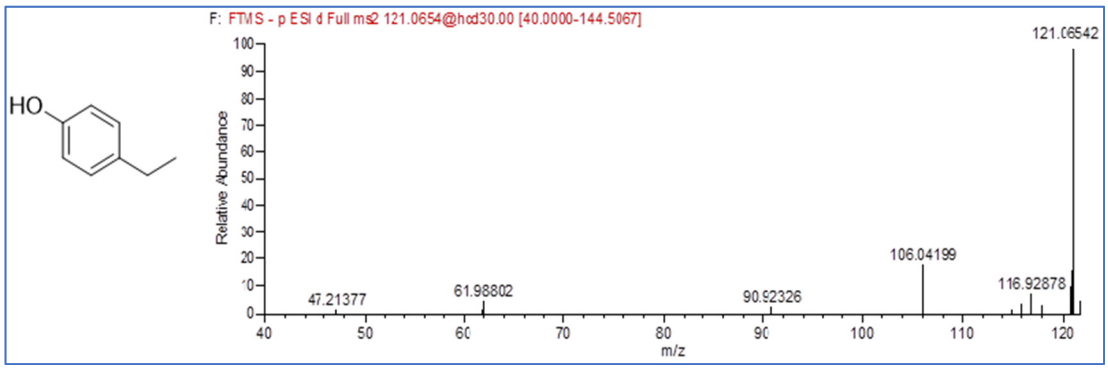

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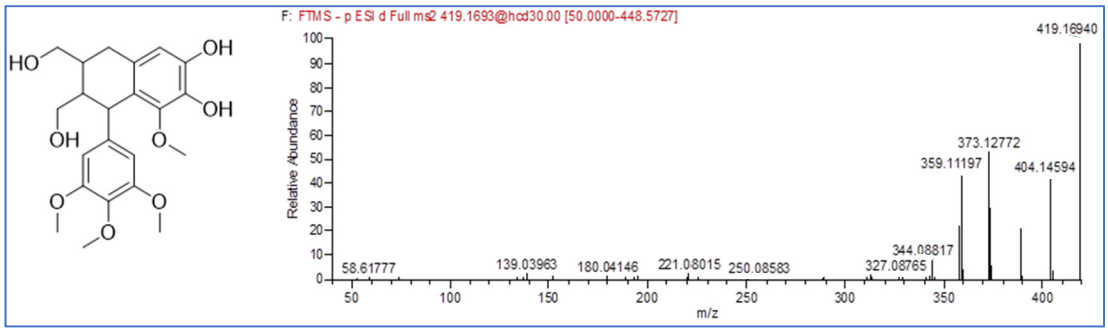

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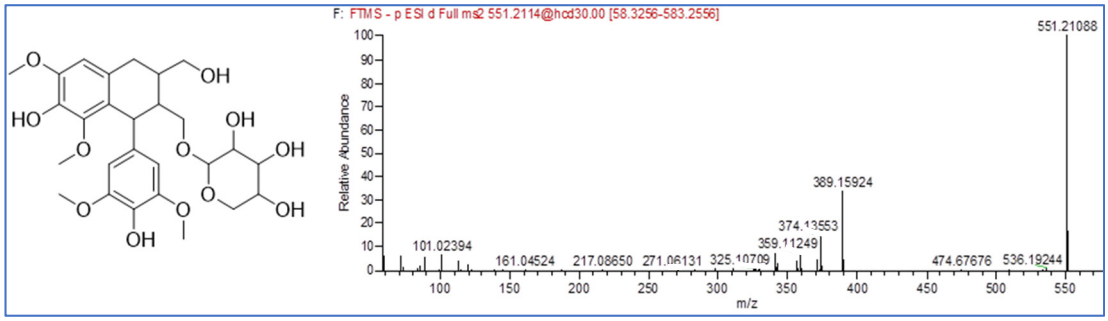

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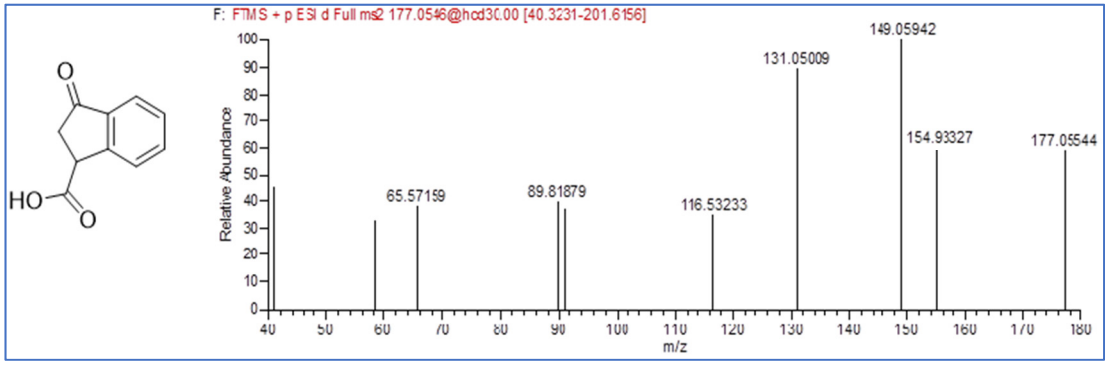

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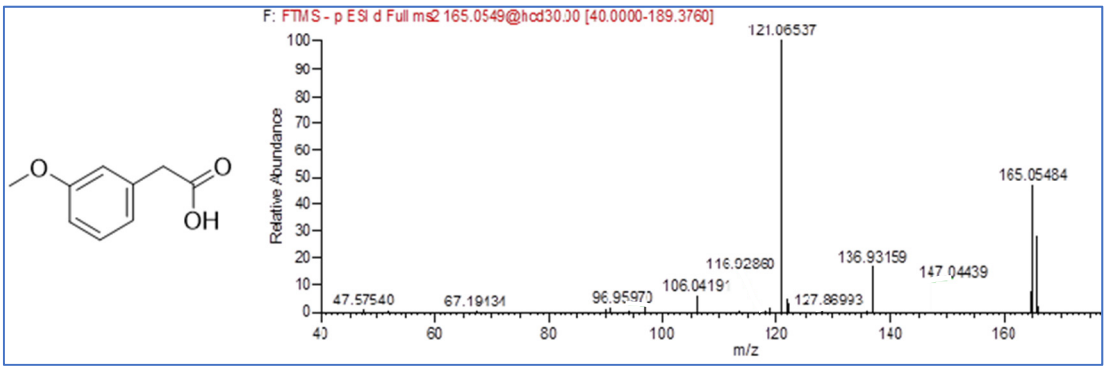

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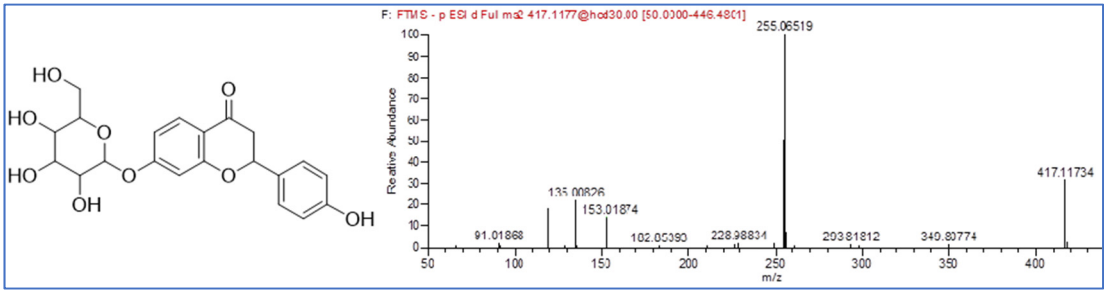

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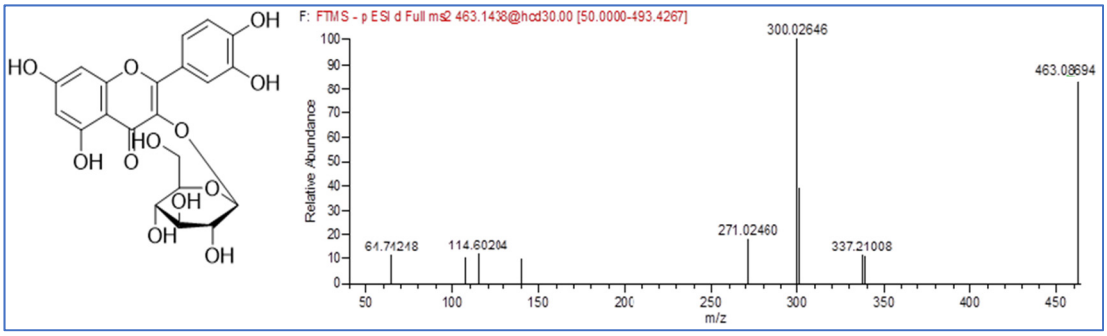

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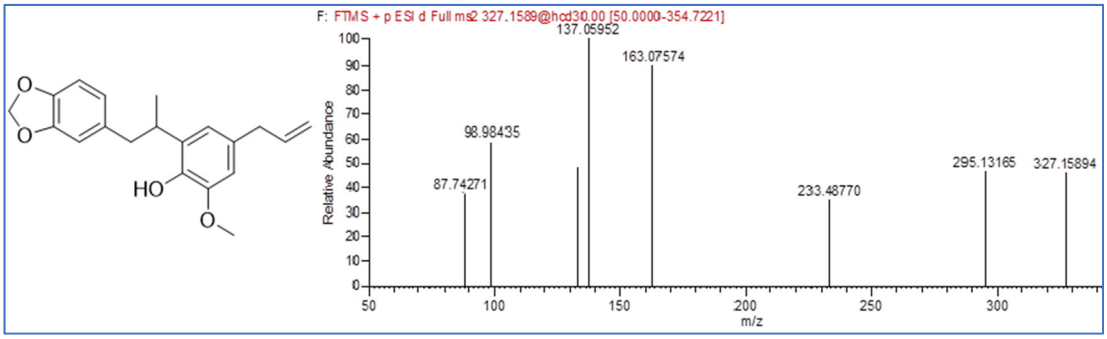

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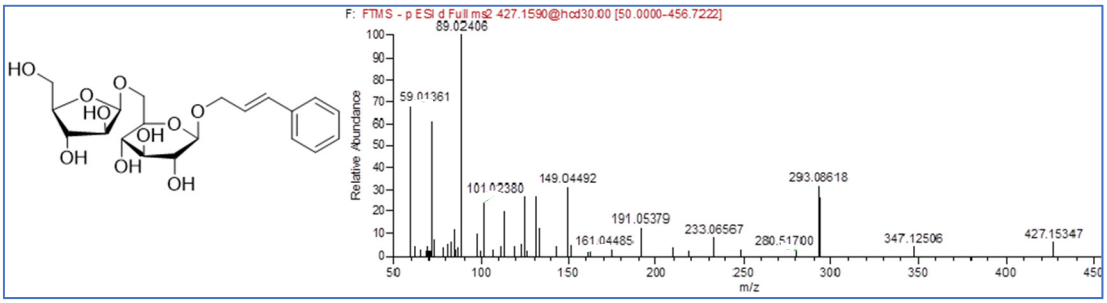

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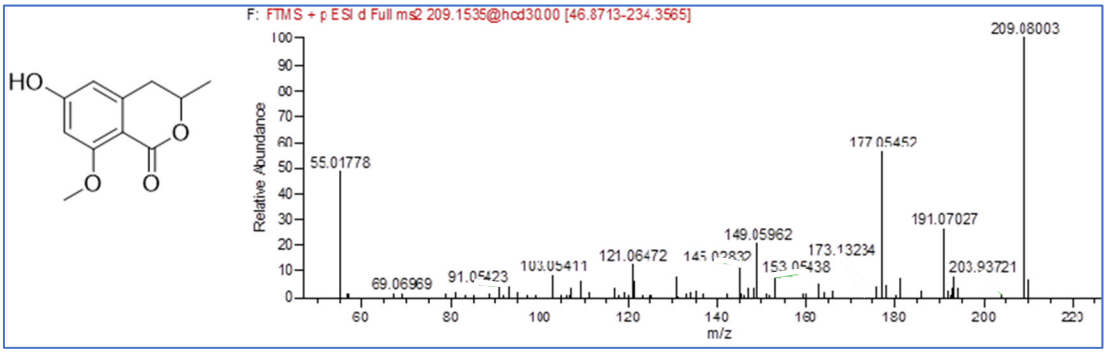

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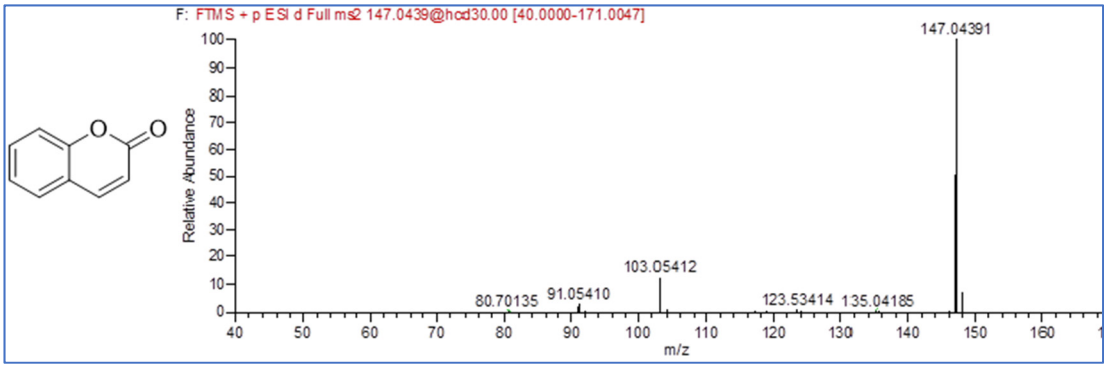

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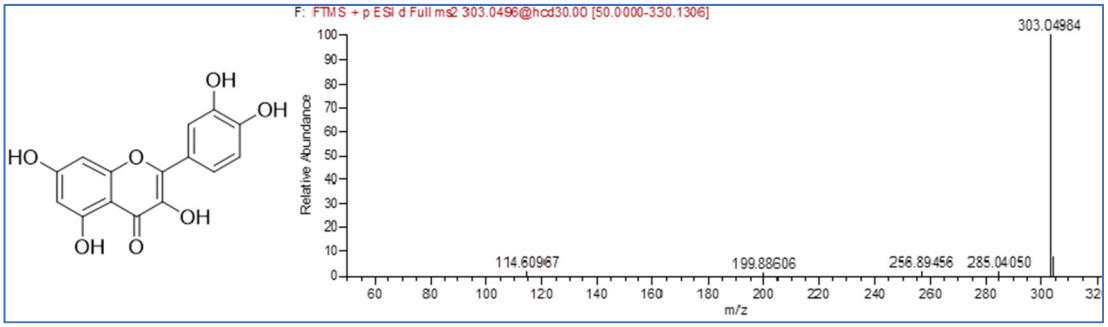

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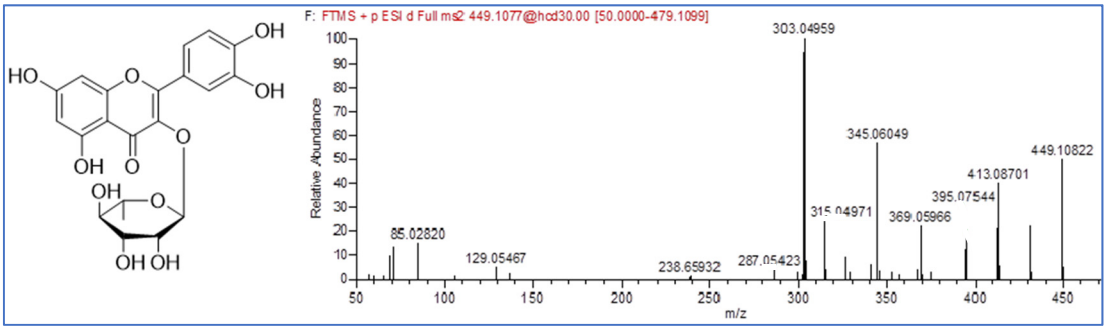

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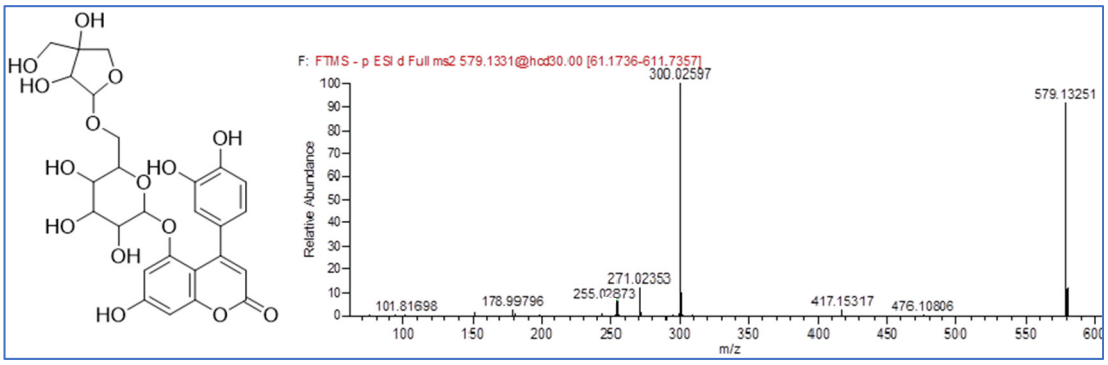

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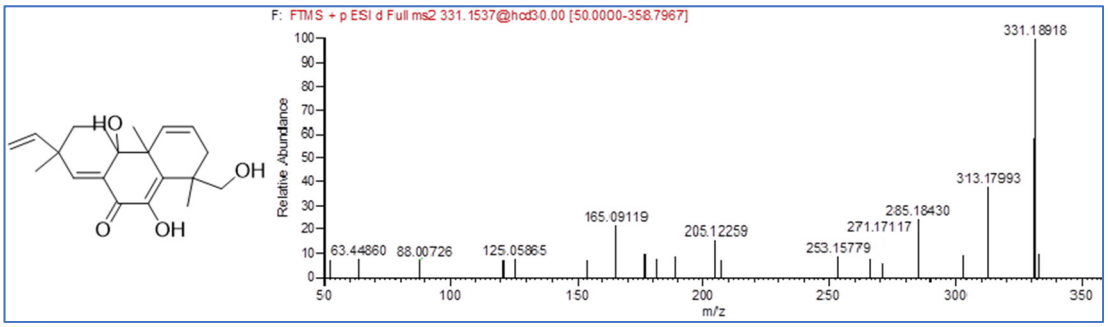

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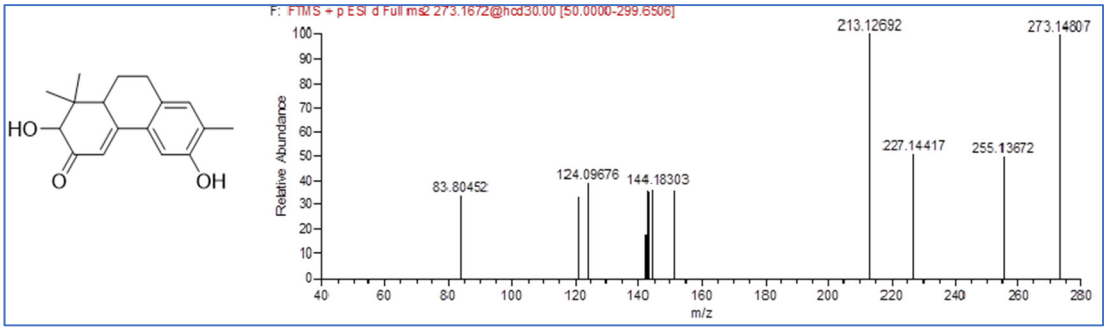

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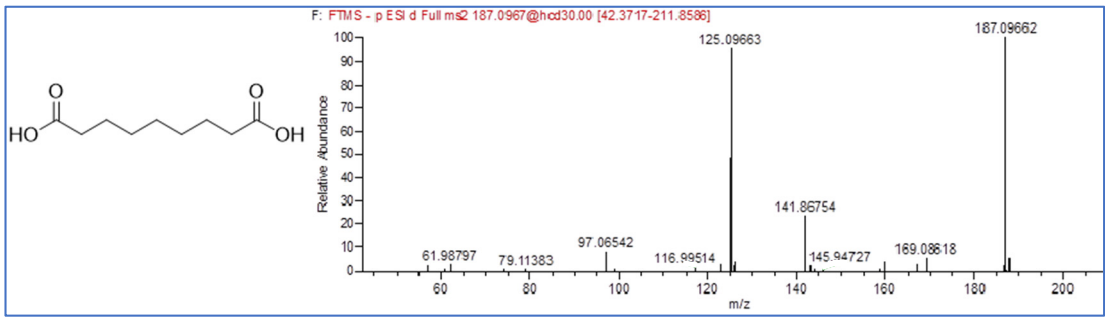

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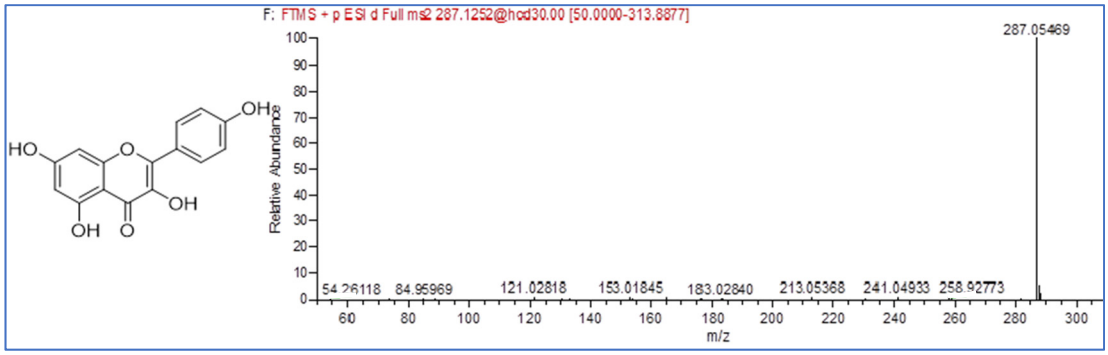

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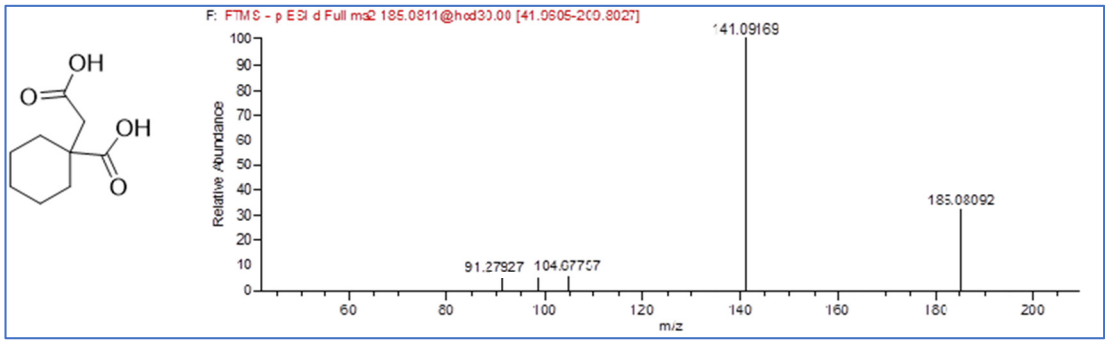

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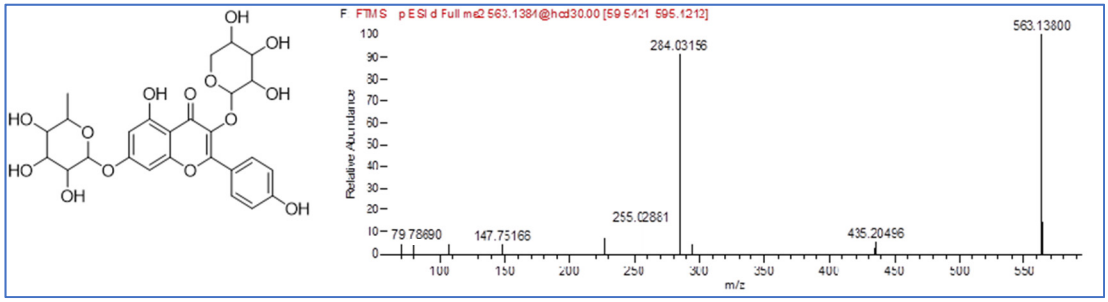

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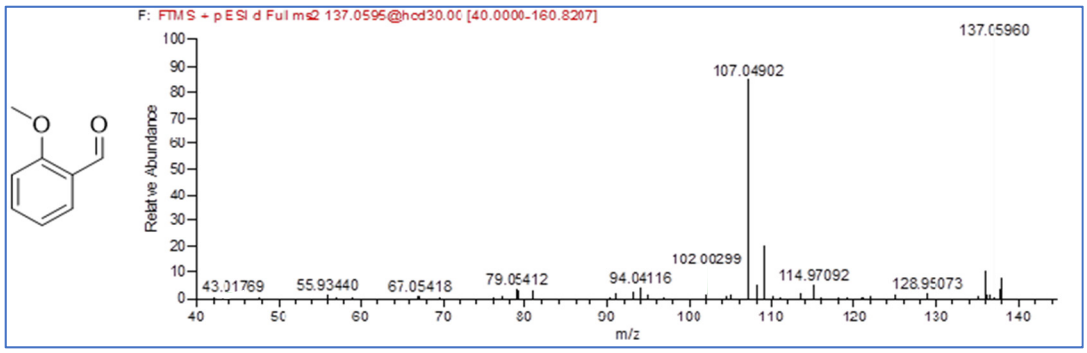

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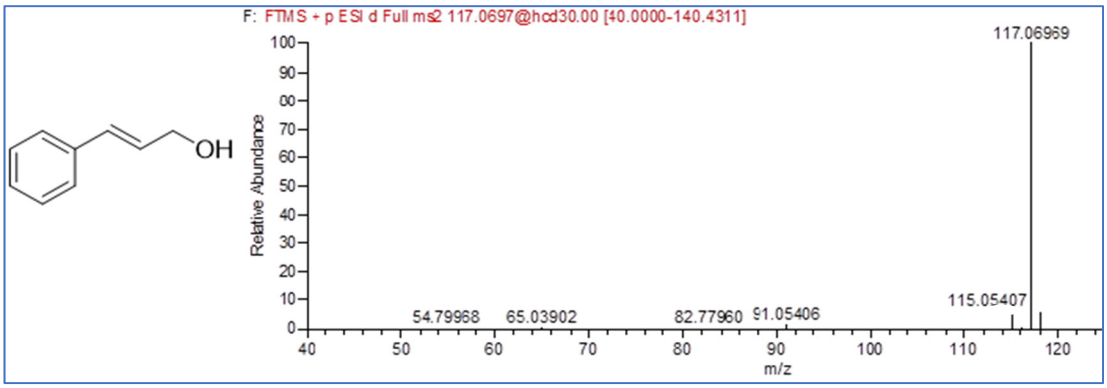

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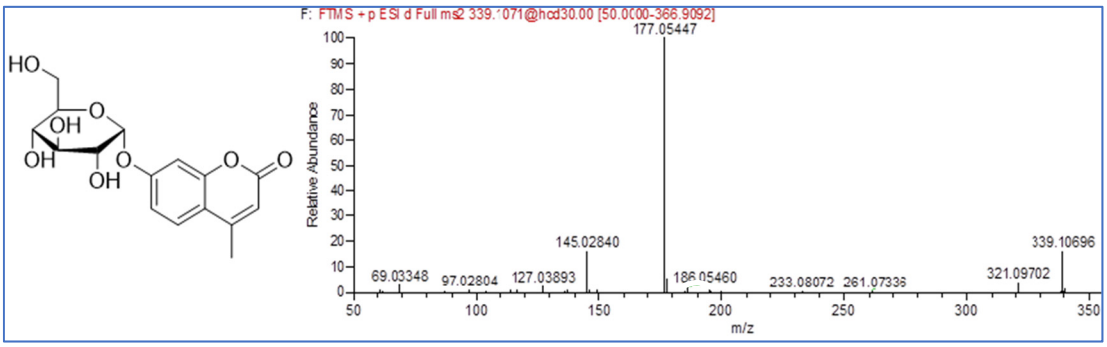

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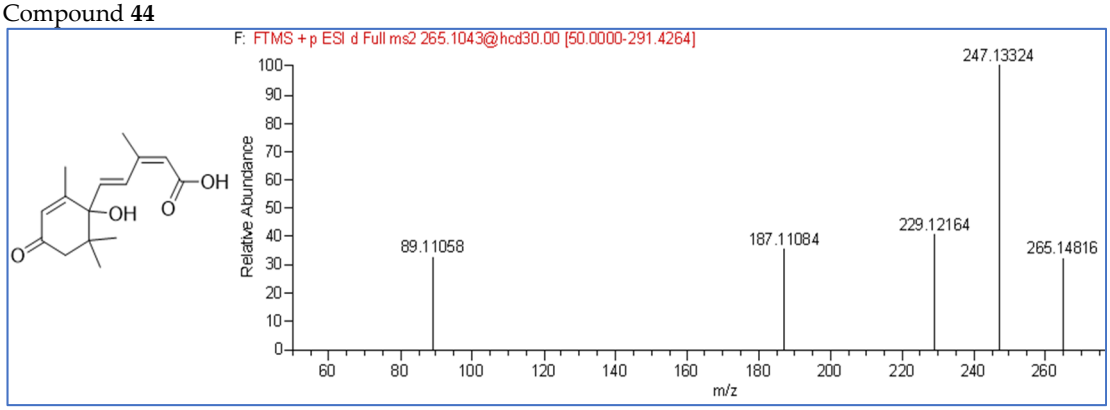

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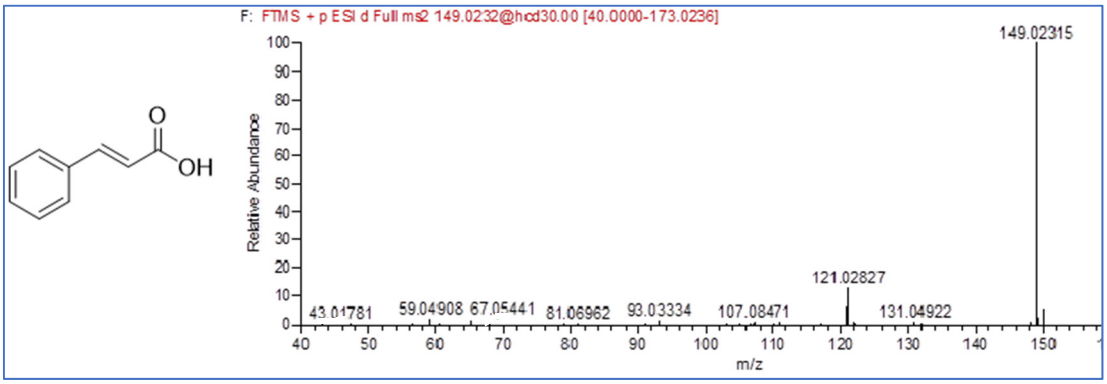

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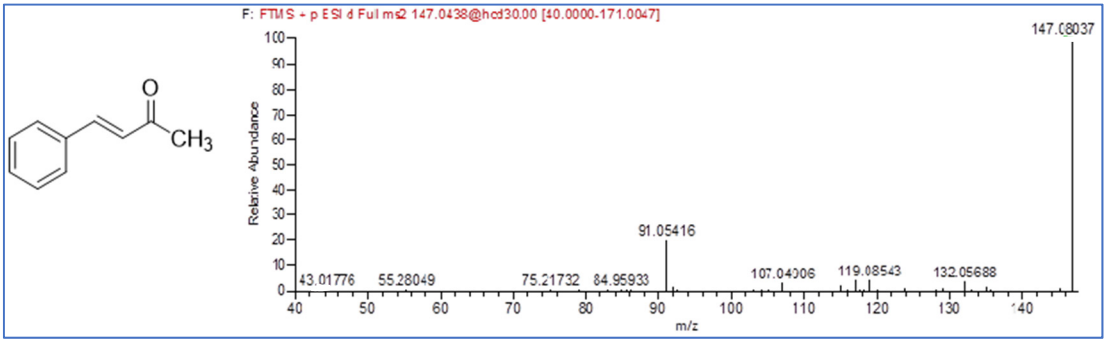

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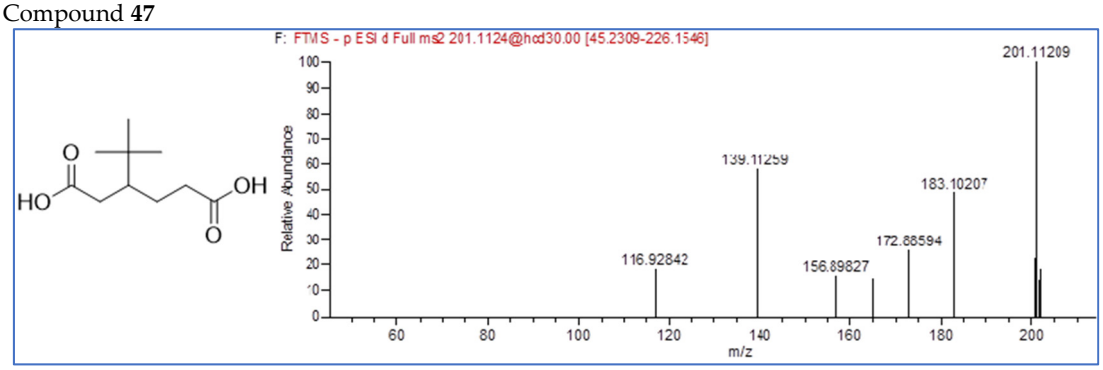

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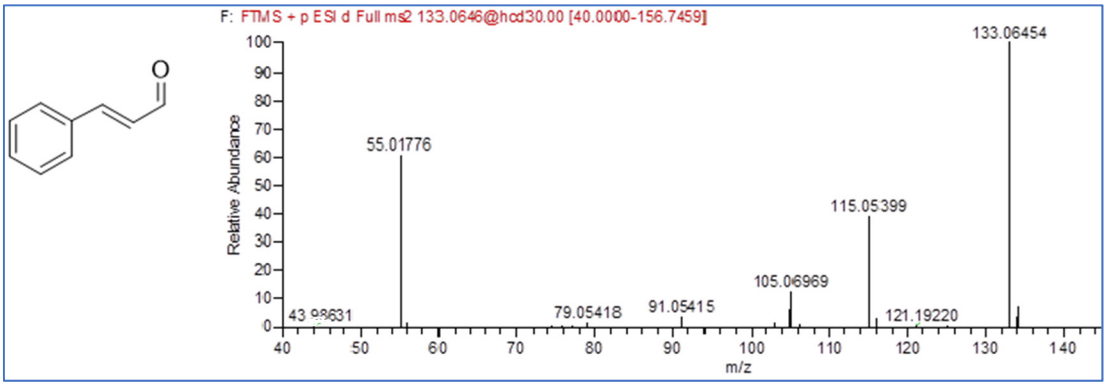

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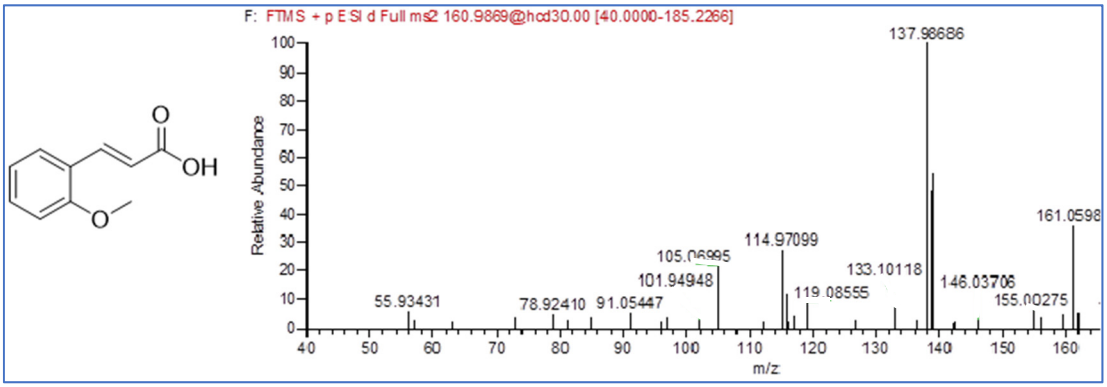
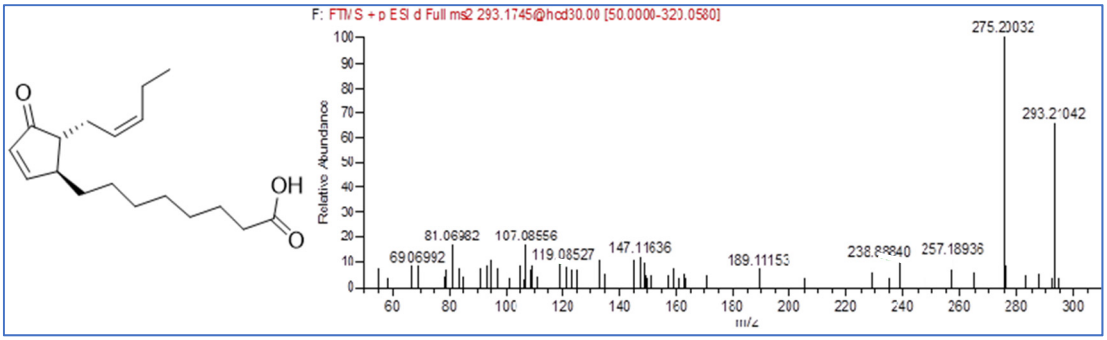
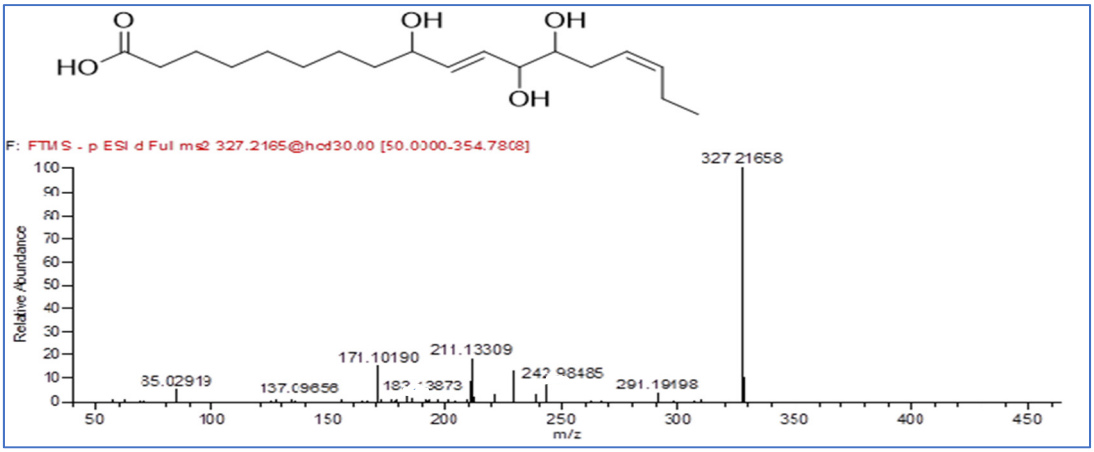


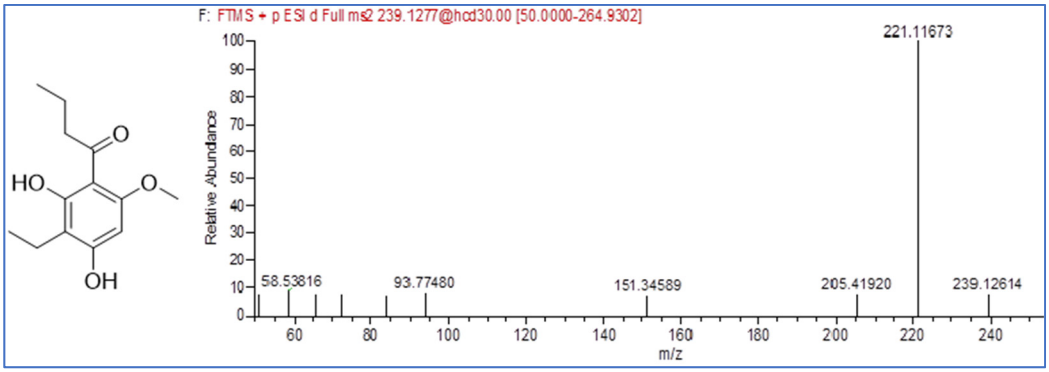
Compound **50**



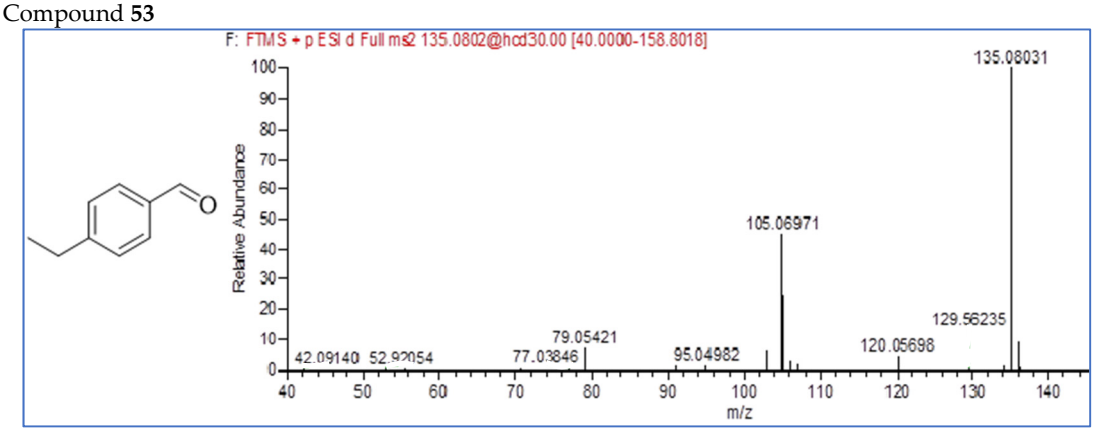
Compound **51**



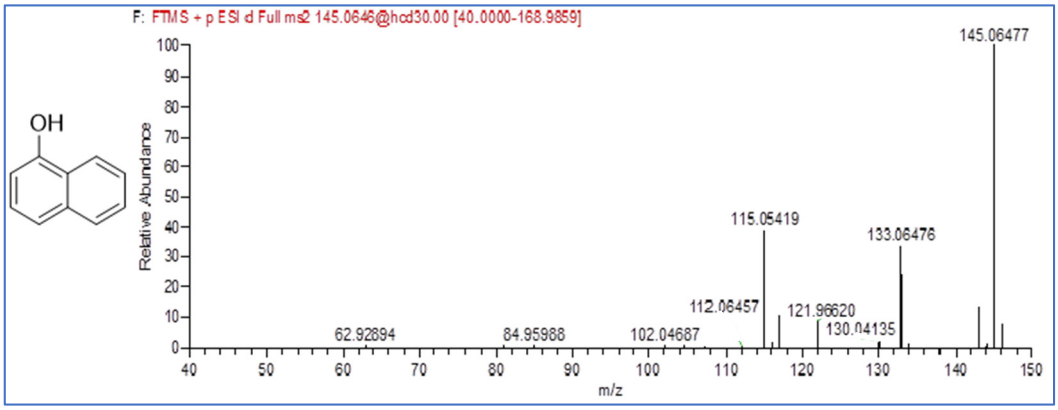
Compound **52**



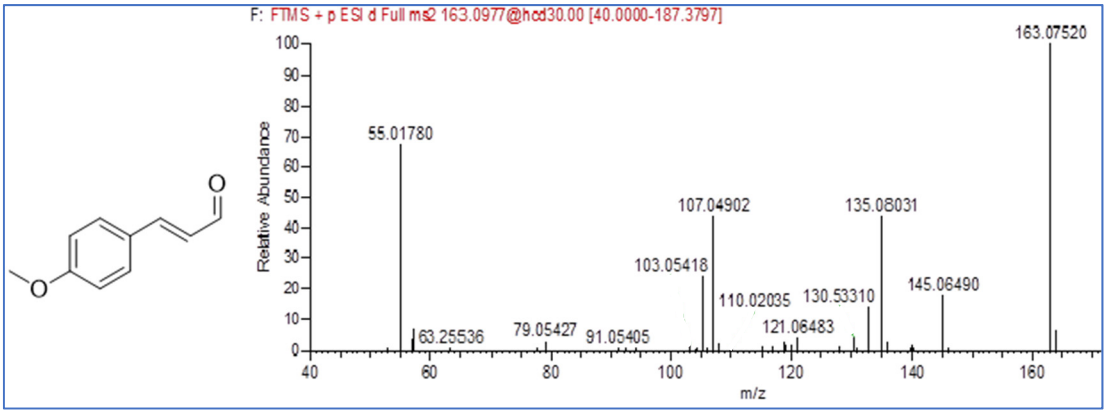
Compound **53**



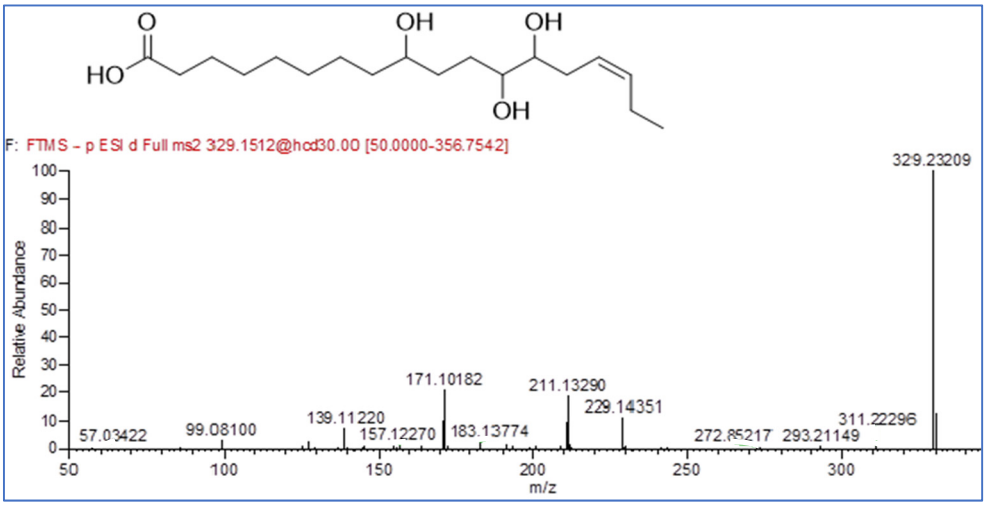
Compound **54**



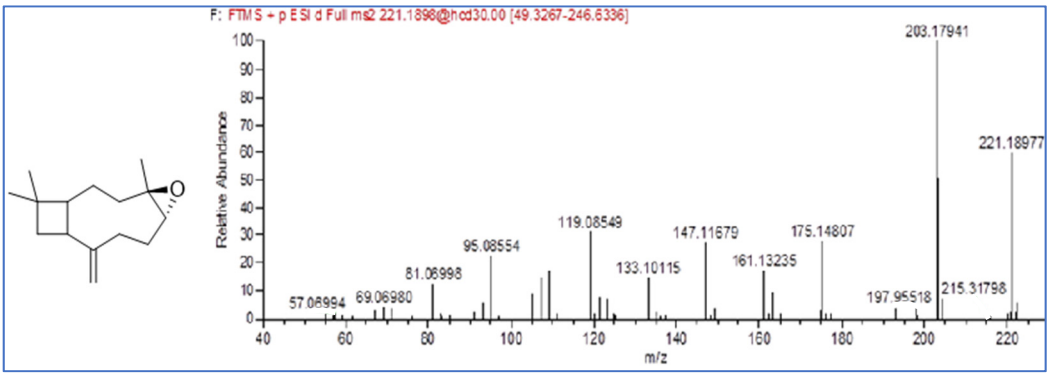
Compound **55**



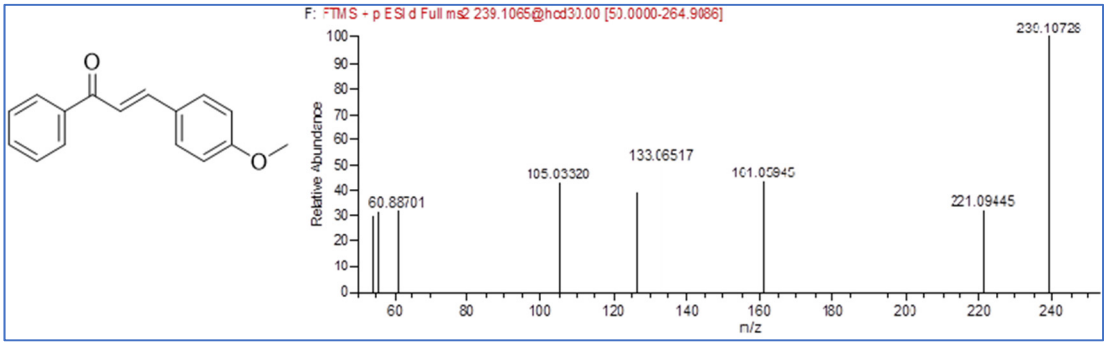
Compound **56**



Compound **57**



Compound **58**



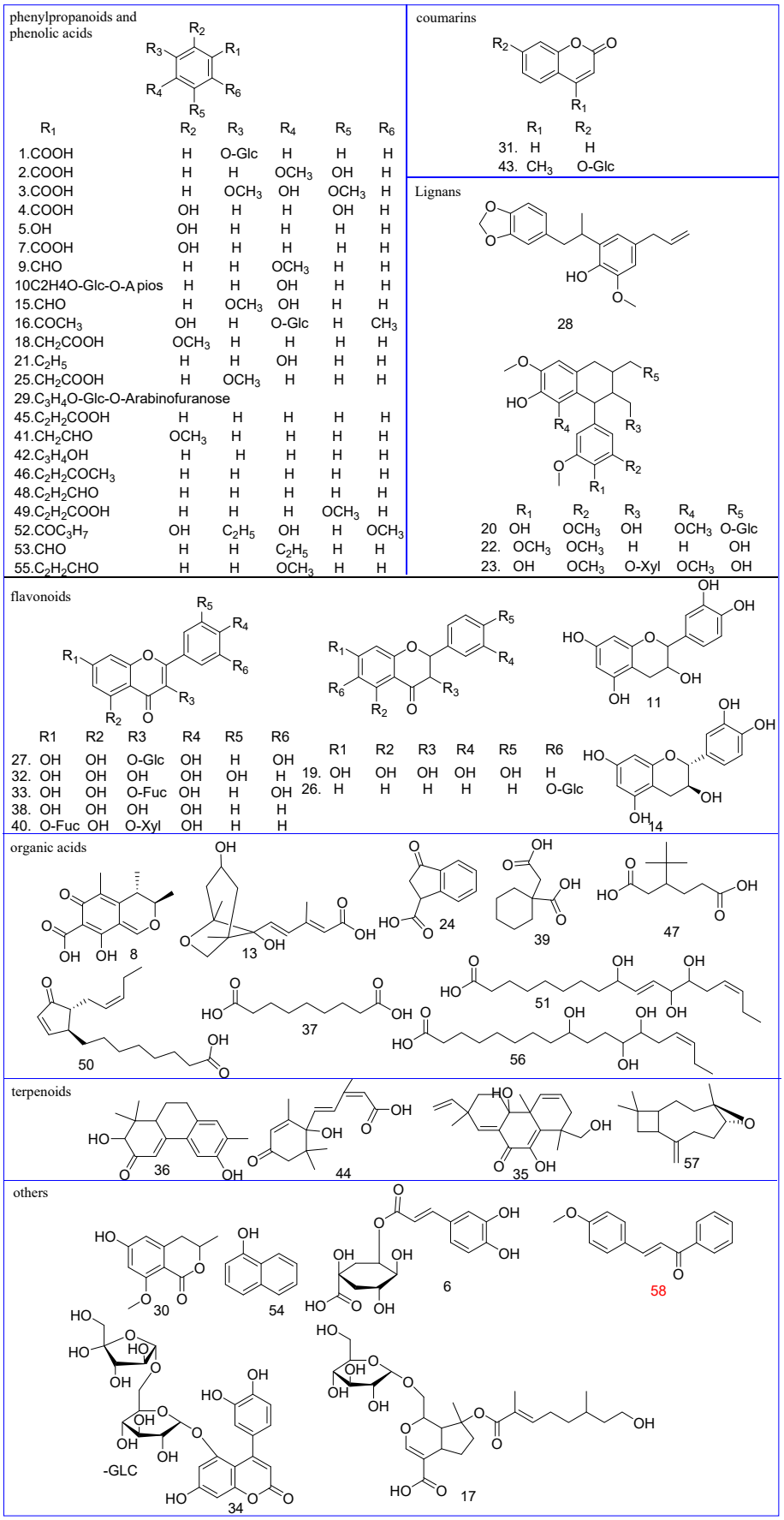


Figure S3. Identified compound structures.

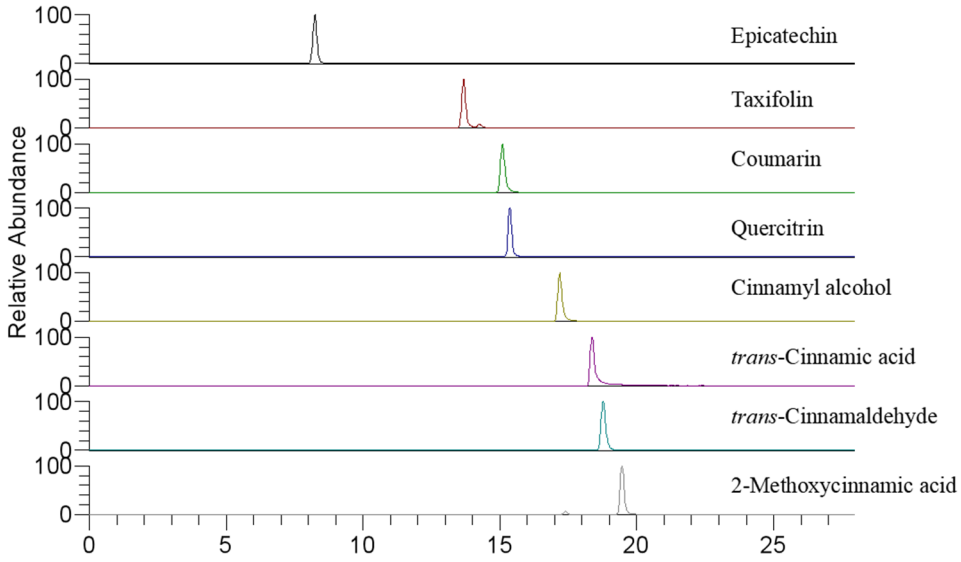


Figure S4. Extracted ion chromatograms (EIC) of 8 standards.

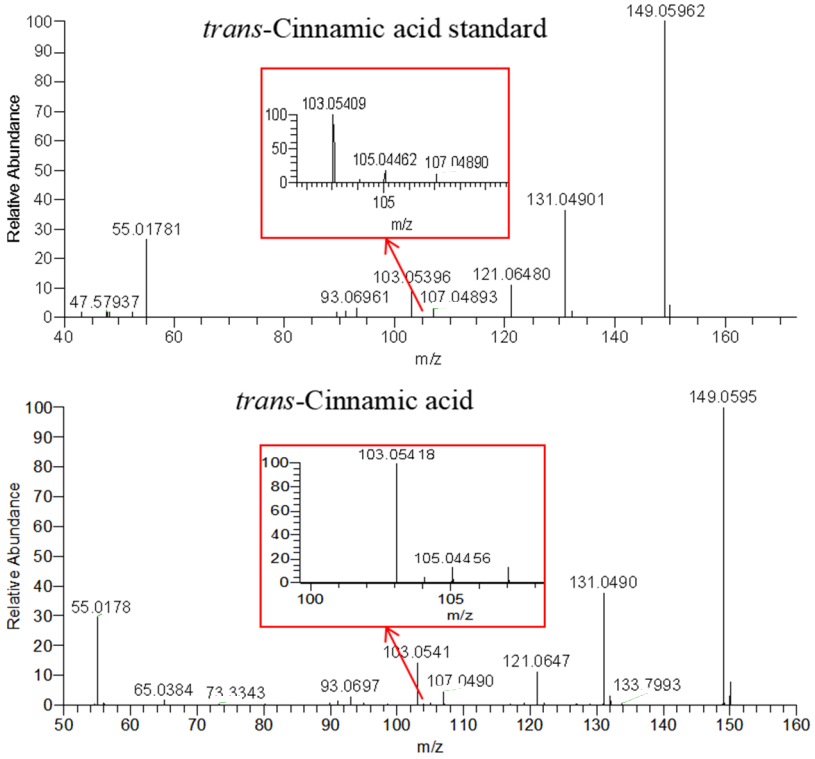


Figure S5. The MS^2 spectrum of *trans*-cinnamic acid.

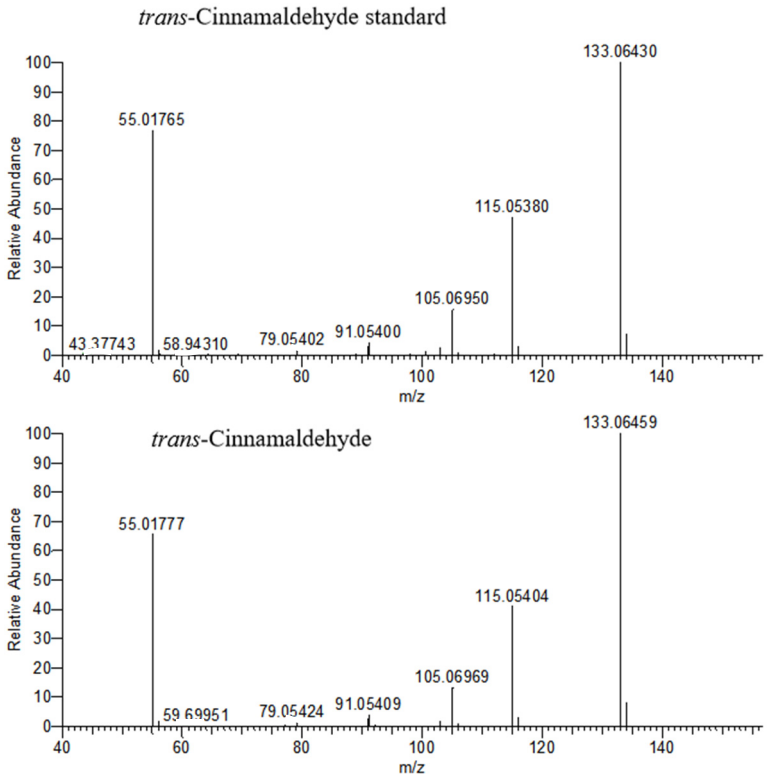


Figure S6. The MS² spectrum of *trans*-cinnamaldehyde.

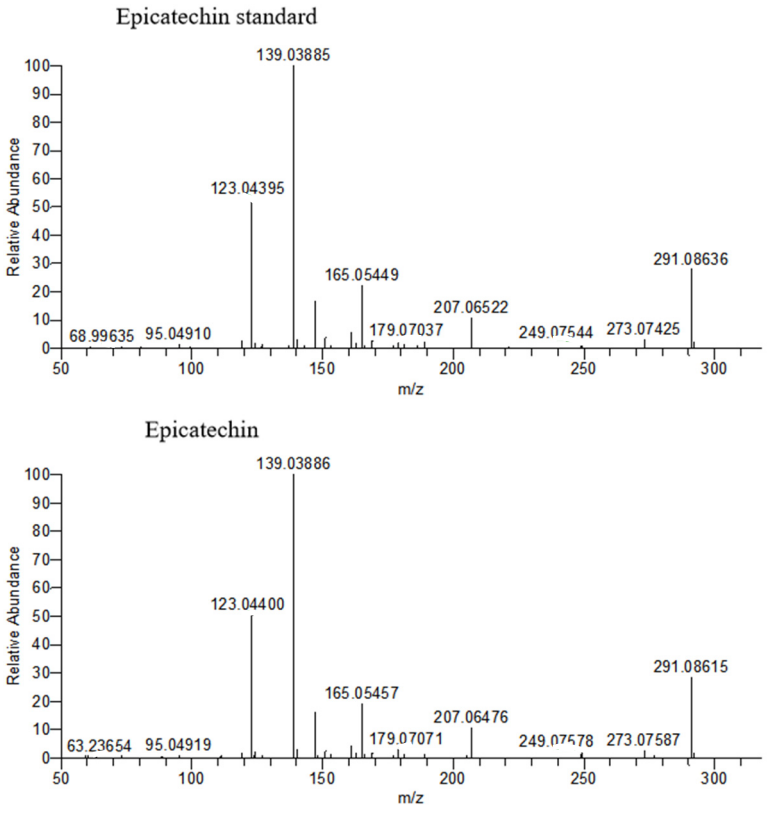


Figure S7. The MS² spectrum of epicatechin.

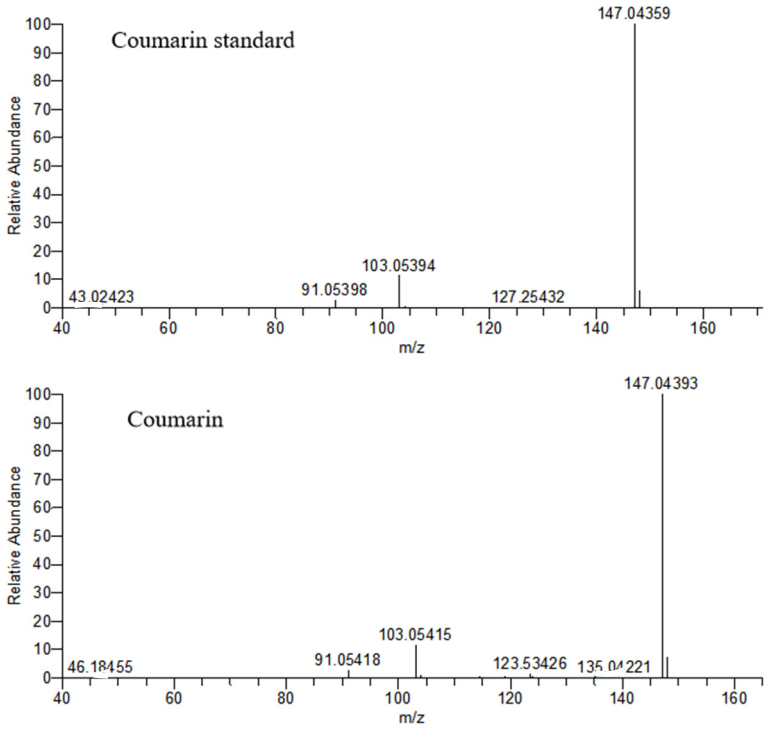


Figure S8. The MS^2 spectrum of of coumarin.

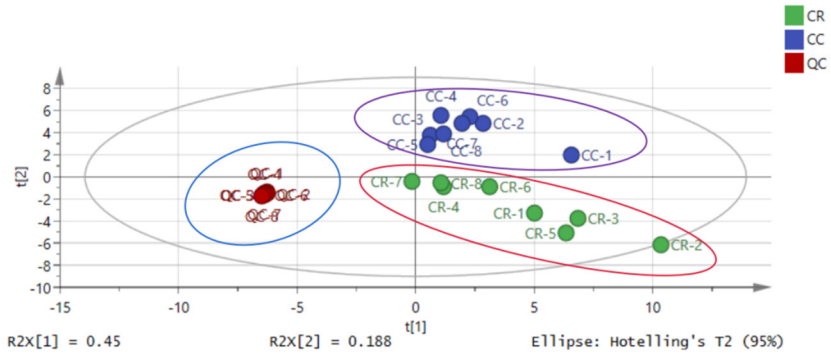


Figure S9. 2D PCA score scatter plot for CR, CC and QC after eliminating outliers.

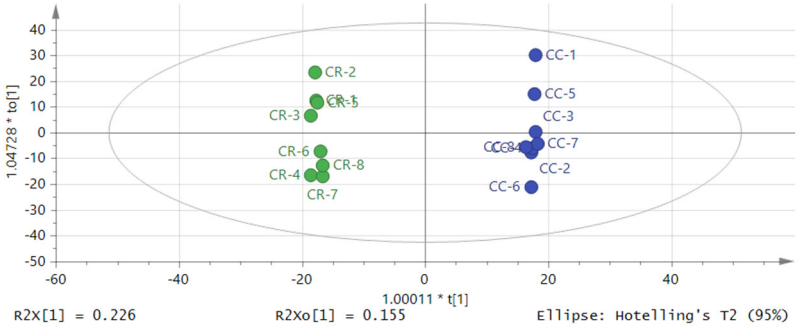


Figure S10. 2D OPLS-DA score scatter plot for CR and CC.

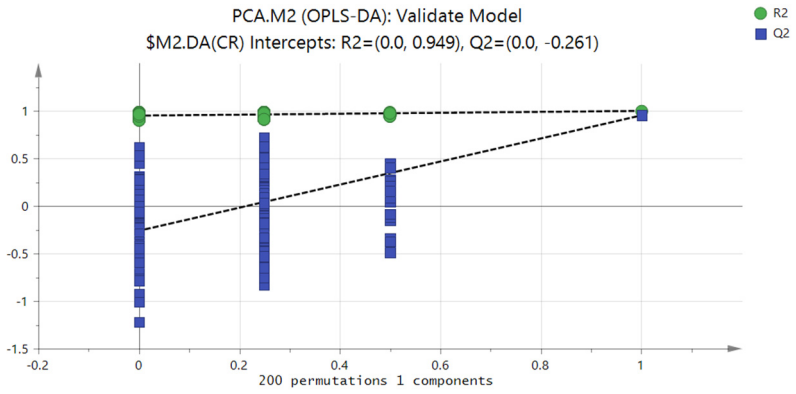


Figure S11. Validate model of OPLS-DA.

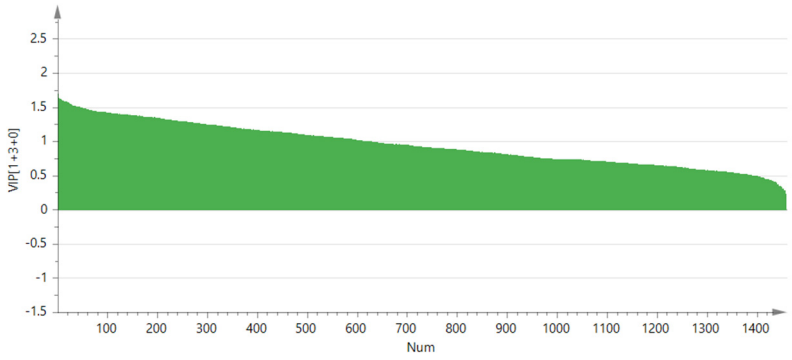


Figure S12. Variable importance of projection (VIP) plot of the OPLS-DA.

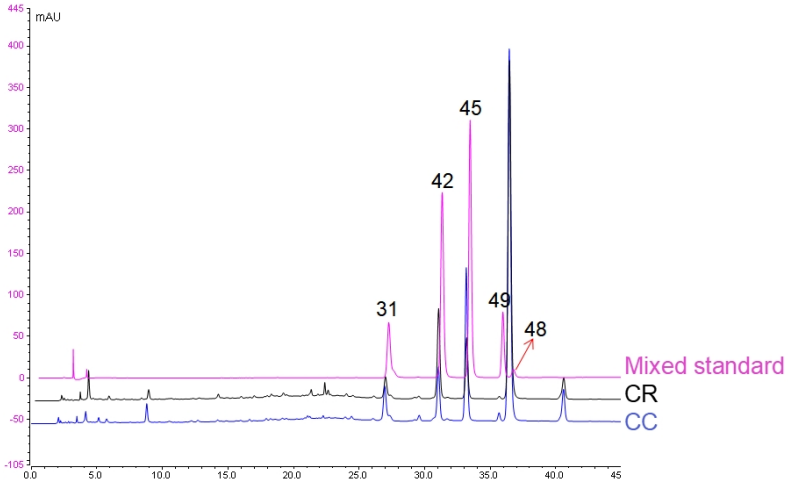


Figure S13. HPLC chromatograms for quantitative analyses. **31**: Coumarin, **42**: Cinnamyl alcohol, **45**: *trans*-Cinnamic acid, **49**: 2-Methoxycinnamic acid, **48**: *trans*-Cinnamaldehyde

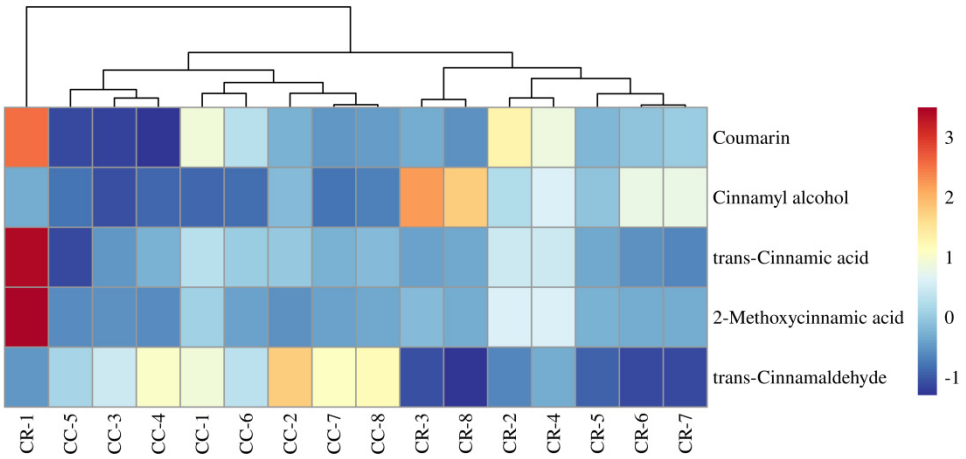


Figure S14. Dendrograms of hierarchical cluster analysis (HCA) for CR and CC.

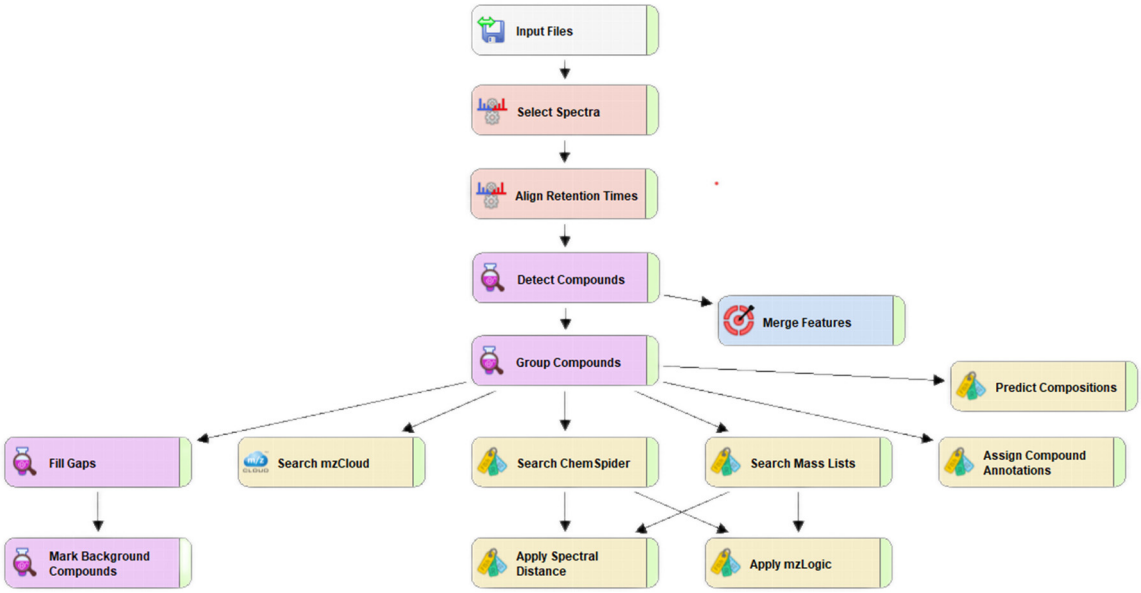


Figure S15. The workflow of compound screening with Compound Discoverer 3.2.

Table S1. Optimization of the LC-MS conditions

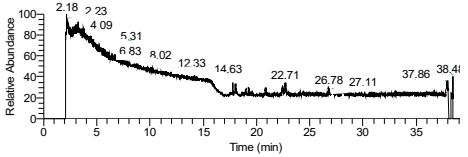
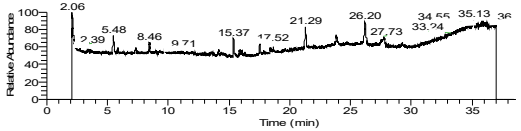
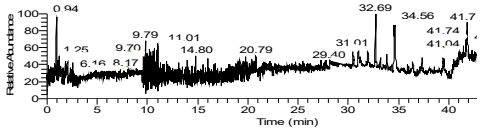
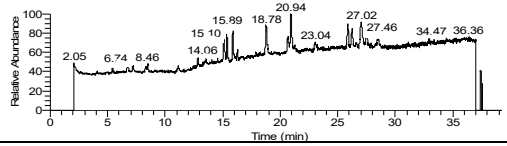
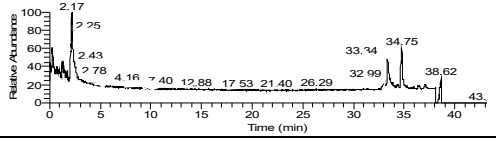
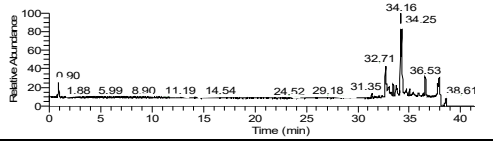
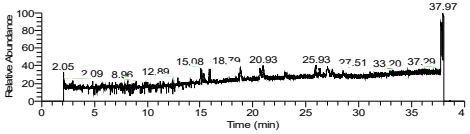
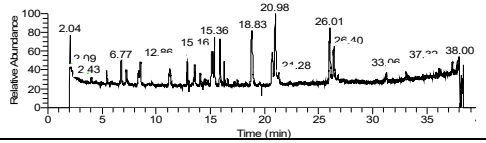
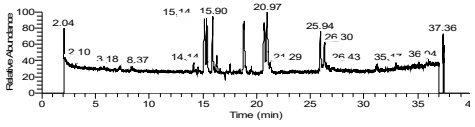
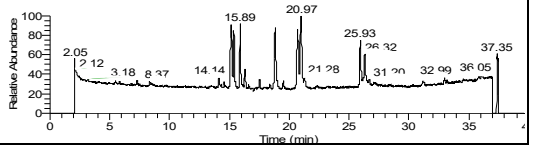
Condition	The total ion chromatogram of CR	Condition	The total ion chromatogram of CR
Methanol/aqueous formic acid		**Acetonitrile/aqueous formic acid**	
Waters Acquity UPLC BEH C18（2.1 mm×100 mm，1.7 μm）		**HYPERSILGOLD Vanquish C18 (2.1 mm × 100 mm, 1.9 μm)**	
column temperature was set at 35 ℃		**column temperature was set at 25 ℃**	
vaporizer temperature was 320 °C		**vaporizer temperature was 350 °C**	
the spray voltage was 3.8 kV(+)		**the spray voltage was 3.5 kV(+)**	

Table S2. Compound information with VIP>1.

No.	Name	VIP	Fold change [a]	P-value [b]
3	Gentisic acid	1.60199	-0.93	0.0100
46	4-Phenyl-3-buten-2-one	1.55590	3.28	0.0001
55	4-Methoxycinnamaldehyde	1.51806	/	0.4002
24	3-Oxoindane-1-carboxylic acid	1.50622	2.93	0.0001
53	4-Ethylbenzaldehyde	1.48790	Specific in CR	0.0002
58	4-Methoxychalcone	1.44618	3.26	0.0005
8	Citrinin	1.44300	Specific in CC	0.0002
1	Gentisic acid 5-O-glucoside	1.39626	1.96	0.0010
48	*trans*-Cinnamaldehyde	1.38744	-1.22	0.0003
42	Cinnamyl alcohol	1.38222	1.88	0.0008
43	4-Methylumbelliferyl-*α*-D-glucopyranoside	1.34671	/	0.1463
40	Kaempferol 3-O-*α*-L-arabinopyranosyl -7-O-*α*-L-rhamnopyranoside	1.29033	7.41	0.0055
41	2-Methoxybenzaldehyde	1.23925	Specific in CR	0.0258
38	Kaempferol	1.23917	3.21	0.0116
34	Graveobioside A	1.22572	3.48	0.0114
5	Catechol	1.22299	-0.67	0.0231
16	4-Acetyl-3-hydroxy-5-methylphenyl β-D-glucopyranoside	1.21275	-1.55	0.0067
17	Picconioside B	1.21051	-2.24	0.0038
45	*trans*-Cinnamic acid	1.20494	-1.16	0.0065
26	2-(4-hydroxyphenyl)-7-((3,4,5-trihydroxy-6-(hydroxymethyl)tetrahydro-2H-pyran-2-yl)oxy)chroman-4-one	1.17656	Specific in CC	0.0191
32	Quercetin	1.16950	Specific in CR	0.0219
31	Coumarin	1.16629	1.15	0.0411
44	(±)-Abscisic acid	1.13767	/	0.0797
27	Quercetin-3*β*-D-glucoside	1.13751	2.81	0.0293
33	Quercitrin	1.13418	Specific in CR	0.0296
36	Yucalexin P-17	1.12735	Specific in CC	0.0126
7	Salicylic acid	1.12588	/	0.2768
49	2-Methoxycinnamic acid	1.11565	/	0.1049
2	Isovanillic acid	1.08152	-0.38	0.0374
22	(−)-Lyoniresinol	1.07830	/	0.1095
19	Taxifolin	1.07764	Specific in CR	0.0295
11	Epicatechin	1.05657	/	0.1232
6	Neochlorogenic acid	1.04831	/	0.0644
14	Catechin	1.02725	/	0.1559
35	Libertellenone B	1.00161	-0.98	0.0497

[a] Fold change=$\log_2$ (A_{CR}/A_{CC}). A_{CR} and A_{CC} represent the peak areas of the compounds in CR and CC. A positive value indicated that the expression of compound in CR was higher than that in CC, while a negative value indicated that the expression of compound in CR was lower than that in CC.

[b] P-value < 0.05 was significant.

Table S3. Results of recovery rate.

NO.	Name	Original sample/ug	Add/ug	Found/ug	Recovery %	Mean %	RSD %
31	Coumarin	0.7071	73.5840	1.4641	104.69%	100.09%	2.42%
		0.7071	73.5840	1.4173	98.21%		
		0.7071	73.5840	1.4153	97.93%		
		0.7071	73.5840	1.4358	100.77%		
		0.7071	73.5840	1.4328	100.36%		
42	Cinnamyl alcohol	0.0366	0.0373	0.0724	95.96%	98.07%	2.77%
		0.0366	0.0373	0.0728	97.13%		
		0.0366	0.0373	0.0718	94.50%		
		0.0366	0.0373	0.0743	101.02%		
		0.0366	0.0373	0.0734	98.59%		
45	*trans*-Cinnamic acid	0.8004	0.7867	1.5520	95.53%	95.11%	2.09%
		0.8004	0.7867	1.5443	94.56%		
		0.8004	0.7867	1.5460	94.77%		
		0.8004	0.7867	1.5602	96.58%		
		0.8004	0.7867	1.5222	91.75%		
49	2-Methoxy cinnamic acid	0.0080	0.00798	0.0158	98.00%	98.30%	2.23%
		0.0080	0.00798	0.0160	99.63%		
		0.0080	0.00798	0.0155	94.18%		
		0.0080	0.00798	0.0158	98.15%		
		0.0080	0.00798	0.0160	100.14%		
48	*trans*-Cinnamaldehyde	23.2100	22.8000	45.1864	96.39%	97.36%	3.43%
		23.2100	22.8000	46.2753	101.16%		
		23.2100	22.8000	45.2955	96.87%		
		23.2100	22.8000	44.2427	92.25%		
		23.2100	22.8000	45.2077	96.48%		

Table S4. Molecular docking fraction.

NO.	Fold change[a]	Name	-CDOCKER INTERACTION ENERGY/ kJ.mol^{-1}			
			HbA1c	PGC1α	SIRT3	AMPK
1	1.96	Gentisic acid 5-O- glucoside	43.8038	67.0292	/	38.5316
2	-0.38	Isovanillic acid	23.2639	35.9152	26.4249	22.5498
3	-0.93	Gentisic acid	25.395	36.1031	23.8157	20.9892
5	-0.67	Catechol	16.6196	25.7563	18.3868	17.6189
8	Specific in CC	Citrinin	28.8092	52.3062	/	39.842
16	-1.55	4-Acetyl-3-hydroxy-5-methylphenyl β-D-glucopyranoside	43.7324	64.7307	/	45.1652
17	-2.24	Picconioside B	62.5016	/	/	50.7858
19	Specific in CR	Taxifolin	39.2912	60.4347	/	49.8092
24	2.93	Lyoniside	21.3959	36.4075	27.7012	23.9108
26	Specific in CC	2-(4-Hydroxyphenyl)-7-((3,4,5-trihydroxy-6-(hydro xymethyl) tetrahydro-2H- pyran-2-yl) oxy) chroman-4-one	53.7767	46.6389	/	44.2027
27	2.81	2-[1-(2H-1, 3-Benzod ioxol-5-yl)propan-2-yl]	52.3853	/	/	56.3881
31	1.15	Coumarin	17.7063	27.0471	18.5035	14.3744
32	Specific in CR	Quercetin	35.5995	66.1113	/	53.0311
33	Specific in CR	Quercitrin	48.2373	28.2954	/	63.6781
34	3.48	Graveobioside A	63.679	/	/	62.8879
35	-0.98	Libertellenone B	32.9261	36.9579	/	41.8519
36	Specific in CC	Yucalexin P-17	35.2668	44.4972	/	28.6512
40	7.41	Kaempferol 3-O-α-L-arabin opyranosyl-7-O-α-L-rhamnopyranoside	64.5903	/	/	66.4067
41	Specific in CR	2-Methoxy benzaldehyde	23.2034	28.5392	19.1136	14.6854
42	1.88	Cinnamyl alcohol	21.9571	26.9709	24.9043	21.6532
45	-1.16	*trans*-Cinnamic acid	18.5375	37.4825	25.3821	20.5352
46	3.28	4-Phenyl-3-buten-2-one	20.6405	27.6936	23.658	16.5148
48	-1.22	*trans*-Cinnamaldehyde	18.8605	27.4942	22.3644	18.7263
49	1.22	2-Methoxycinnamic acid	20.0461	26.8977	23.5866	15.9781
53	Specific in CR	4-Ethylbenzaldehyde	17.9064	27.6039	23.2434	16.3396
58	3.26	4-Methoxychalcone	30.8117	35.4958	/	27.9932

[a] Fold change=$\log_2$ (A_{CR}/A_{CC}). A_{CR} and A_{CC} represent the peak areas of the compounds in CR and CC. A positive value indicated that the expression of compound in CR was higher than that in CC, while a negative value indicated that the expression of compound in CR was lower than that in CC.

Table S5. Information on 8 batches of CR and CC.

No.	Origins	Sample sources	Collection times	Voucher specimen No.
CR-1	Guangxi	Kangmei pharmaceutical Bozhou Huatuo traditional Chinese medicine city	2020.07	20210910-001
CR-2	Guangxi	Henan Zhang Zhongjing Pharmacy Co., Ltd Zhengzhou City Store	2019.08	20210910-002
CR-3	Guangxi	Wuzhou city, guangxi	2021.08	20210910-003
CR-4	Guangxi	Kangmei pharmaceutical Bozhou Huatuo Traditional Chinese medicine city	2021.08	20210910-004
CR-5	Guangxi	Henan Zhang Zhongjing Pharmacy Co., Ltd Zhengzhou City Store	2019.08	20210910-005
CR-6	Guangdong	Zhaoqing, Guangdong	2021.09	20210910-006
CR-7	Guangdong	Zhongtang town, dongguan city, Guangdong	2021.06	20210910-007
CR-8	Sichuan	Kangmei pharmaceutical Bozhou Huatuo traditional Chinese medicine city	2021.08	20210910-008
CC-1	Guangxi	Kangmei pharmaceutical Bozhou Huatuo traditional Chinese medicine city	2021.08	20210911-001
CC-2	Guangxi	Kangmei pharmaceutical Bozhou Huatuo traditional Chinese medicine city	2022.08	20210911-002
CC-3	Guangxi	Guangxi	2021.09	20210911-003
CC-4	Guangdong	Dongguan, Guangdong province	2021.09	20210911-004
CC-5	Guangxi	Anhui bozhou economic development zone	2021.09	20210911-005
CC-6	Guangxi	Henan Zhang Zhongjing Pharmacy Co., Ltd Zhengzhou City Store	2019.08	20210911-006
CC-7	Guangxi	Kangmei pharmaceutical Bozhou Huatuo traditional Chinese medicine city	2021.08	20210911-007
CC-8	Sichuan	Kangmei pharmaceutical Bozhou Huatuo traditional Chinese medicine city	2021.08	20210911-008

Identification of other constituents of CR and CC

S1. Identification of other phenylpropanoids and phenolic acids

The diagnostic ions at *m*/*z* 163/165, 151/153 and 135/137 were indicators of phenylpropanoids and phenolic acids in literature [23,67]. Besides, we found that fragment ions at *m*/*z* 105/107 and 123/125 also could be diagnostic ions by statistical analyses [23,67].

Compounds **1**, **2**, **3**, **4**, **15** and **18** were filtered by *m*/*z* 151 or 153. Compound **2** showed a precursor ion at *m*/*z* 167.0342 $[M-H]^-$, which suggested a molecular formula of $C_8H_8O_4$, and showed the fragment ions at *m*/*z* 151.0226 $[M - O]^-$ and *m*/*z* 123.0449 $[M - COOH - H]^-$ that indicated the hydroxyl and carboxyl groups, thus compound **2** putatively was identified as isovanillic acid by the published literature [29] and database. Compound **4** possessed a molecular formula of $C_8H_8O_4$ by a precursor ion at *m*/*z* 199.0588 $[M + H]^+$, and exhibited the fragment ions at *m*/*z* 181.0495$[M - OH + H]^+$, *m*/*z* 163.1478 $[M - 2H_2O + H]^+$ and *m*/*z* 153.0764 $[M - OH - OCH_3 + H]^+$, thus compound **4** was tentatively identified as syringic acid by the published literature [35]. Compounds **15** and **18** had a same molecular formula of $C_8H_8O_3$ by their same precursor ions at *m*/*z* 153.0545 $[M + H]^+$. However, compound **15** directly lost one carbonyl group to form an ion peak of *m*/*z* 125.0595 $[M - CO + H]^+$ and compound **18** lost one carboxyl and methylene group and showed *m*/*z* 95.0491 $[M - CO_2 - CH_2 + H]^+$, thus compounds **15** and **18** were respectively presumed to be vanillin [39] and 2-anisic acid [68]. Compounds **1** and **3** with the molecular formulas of $C_{13}H_{16}O_9$, and $C_7H_6O_4$ by the precursor ions at *m*/*z* 315.0709 $[M + H]^+$ and 153.0187 $[M + H]^+$, had the common fragment ions at *m*/*z* 153.0185 $[M - C_6H_{10}O_5 + H]^+$ or 153.0187 $[M + H]^+$, and *m*/*z* 109.0293 $[M - C_6H_{10}O_5 - COOH + H]^+$ or *m*/*z* 109.0288 $[M - COOH + H]^+$, thus compounds **1** and **3** were tentatively identified as gentisic acid 5-O-glucoside and gentisic acid [35].

Compounds **9**, **41**, **45**, **46**, **48**, **49**, **52**, **53** and **55** were filtered by *m*/*z* 105 or 107. Compound **46** possessed a molecular formula of $C_{10}H_{10}O$ by the ion peak at *m*/*z* 147.0803 $[M + H]^+$, and also showed the fragment ions at *m*/*z* 132.0567 $[M - CH_3 + H]^+$, *m*/*z* 107.0489 $[M - CH - CO + H]^+$ and *m*/*z* 91.0541 $[M - C_3H_4O + H]^+$, thus compound **46** was tentatively identified as 4-phenyl-3-buten-2-one [49]. Compound **49** produced the ion peak at *m*/*z* 161.0596 $[M - H_2O + H]^+$, indicating a molecular formula of $C_{10}H_{10}O_3$, and also showed the fragment ions at *m*/*z* 133.1011 $[M - H_2O - CO + H]^+$, *m*/*z* 119.0855 $[M - CHO - OCH_2 + H]^+$ and *m*/*z* 105.0698 $[M - COOH - CH + H]^+$, thus compound **49** was putatively

identified as 2-methoxycinnamic acid [48]. Compound **52** with a molecular formula of $C_{13}H_{18}O_4$ by *m*/*z* 239.1275 $[M + H]^+$, showed the signals at *m*/*z* 205.1192 $[M - 2OH + H]^+$, *m*/*z* 179.0705 $[M - C_2H_5 - OCH_3 + H]^+$, *m*/*z* 151.0753 $[M - C_2H_5 - C_3H_7O + H]^+$, *m*/*z* 107.0481 $[M - 2OH - 2OCH_3 - C_2H_4 - C_3H_3 + H]^+$ and *m*/*z* 95.0861 $[M - OH - 2OCH_3 - C_2H_5 - C_4H_3O + H]^+$, thus compound **52** was putatively identified as deoxyphomalone [50]. Compound **55** with a molecular formula of $C_{10}H_{10}O_2$ by *m*/*z* 163.0754 $[M + H]^+$, and exhibited the ions at *m*/*z* 135.0803 $[M - CO + H]^+$, *m*/*z* 110.0203 $[M - C_3H_3O + H]^+$, *m*/*z* 105.0699 $[M - CO - OCH_3 + H]^+$ and *m*/*z* 79.0542$[M - C_3H_3O - OCH_3 + H]^+$, thus compound **55** was putatively identified as 4-methoxy cinnamaldehyde [46]. The cleavage of compounds **45** and **48** were shown in the manuscript.

Compounds **9** and **41** with a common molecular formula of $C_8H_8O_2$ showed the similar fragment ions at *m*/*z* 107, 93, 79. For example, compound **9** with $[M + H]^+$ ions of *m*/*z* 137.0596 produced an $[M - OCH_2 + H]^+$ ion at *m*/*z* 107.0490, an $[M - CO - CH_3 + H]^+$ ion at *m*/*z* 93.0590, and an $[M - CO - OCH_3 + H]^+$ ion at *m*/*z* 79.0543. Thus compounds **9** and **41** were tentatively identified as 4-methoxybenzaldehyde and 2-methoxybenzaldehyde [28]. Compound **53** produced *m*/*z* 135.0803 $[M+H]^+$, with a formula of $C_9H_{10}O$, and also showed *m*/*z* 135.0803 $[M + H]^+$, *m*/*z* 107.0490 $[M - CO + H]^+$, *m*/*z* 105.0697 $[M - C_2H_6 + H]^+$ and *m*/*z* 79.0542 $[M - C_2H_6 - CO + H]^+$, thus compound **53** was presumed to be 4-ethylbenzaldehyde [52].

Compound **6** showed the precursor ion at *m*/*z* 353.0886 $[M - H]^-$, which indicated a formula of $C_{16}H_{18}O_9$, was tentatively identified as neochlorogenic acid [35], it produced similar fragment ions at *m*/*z* 191.0550 $[M - C_9H_6O_3 - H]^-$, *m*/*z* 179.0343 $[M - C_7H_{10}O_5 - H]^-$, *m*/*z* 161.0237 $[M - C_7H_{10}O_5 - H_2O - H]^-$ and *m*/*z* 135.0445 $[M - C_7H_{10}O_5 - CO_2 - H]^-$. Compound **7** had the precursor ion at *m*/*z* 137.0238 $[M - H]^-$, with a formula of $C_7H_6O_3$, and also showed *m*/*z* 119.0132 $[M - H_2O - H]^-$, *m*/*z* 108.8992 $[M - CO - H]^-$ and *m*/*z* 93.0343 $[M - COO - H]^-$, thus compound **7** presumed to be vanillin salicylic acid [24].

Compound **16** had a molecule formula of $C_{15}H_{20}O_8$ by *m*/*z* 327.1073 $[M-H]^-$, showed the fragment ions at *m*/*z* 165.0548 $[M - C_6H_{10}O_5 - H]^-$, *m*/*z* 147.0446 $[M - C_6H_{10}O_5 - H_2O - H]^-$ and *m*/*z* 121.0653 $[M - C_6H_{10}O_5 - OH - CH_3 - CH_2 - OH]^-$, therefore compound **16** were tentatively identified as 4-acetyl-3-hydroxy- 5-methylphenyl-*β*-D-glucopyranoside [27]. Compound **21** produced a molecule formula of $C_8H_{10}O$ by *m*/*z* 121.0654 $[M - H]^-$ and *m*/*z* 106.0419 $[M - CH_3 - H]^-$, which tentatively identified compound **21** as 4-ethylphenol [44]. Compound **25** showed the ions at *m*/*z*

165.0548 [M − H]⁻, which suggested a molecule formula of $C_{15}H_{20}O_8$, and showed *m*/*z* 136.9315 [M − OCH_3 − H]⁻ and *m*/*z* 96.9597 [M − $C_2H_3O_2$ − H]⁻, hence compound **25** was tentatively identified as 3-methoxyphenylacetic acid by the published literature and database [69]. Compound **42** had a formula of $C_9H_{10}O$, and exhibited the ions at *m*/*z* 117.0698 [M − H_2O + H]⁺, and *m*/*z* 91.0540 [M − C_2H_4O + H]⁺, thus compound **42** was identified as cinnamyl alcohol [46].

S2. Identification of other flavonoids

Two epicatechins **11** and **14** were filtered by *m*/*z* 291 or 289 [23,67]. Compounds **11** and **14** showed a same molecular formulas $C_{15}H_{14}O_6$ through their precursor ions at *m*/*z* 291.0860 $[M + H]^+$ and *m*/*z* 289.0703 $[M - H]^-$, respectively. And their fragmentation behaviours and fragment ions were basically identical, thus compound **14** should be an isomer of **11** that was identified by the retention time of standard. Therefore, compound **14** were presumed to be catechin [70,71].

Three quercetins **27**, **32** and **33** were filtered by *m*/*z* 303 or 301 [23,67]. Compounds **27**, **32** and **33** had the molecular formulas of $C_{21}H_{20}O_{12}$, $C_{15}H_{10}O_7$ and $C_{21}H_{20}O_{11}$, but showed the similar fragment ions at *m*/*z* 257, 229. For example, compound **32** with $[M + H]^+$ ions of *m*/*z* 303.0496 produced an [M − CO − H_2O + H]⁺ ion at *m*/*z* 257.0446 and an [M − 2CO − H_2O + H]⁺ ion at *m*/*z* 229.0491, thus compound **32** was identified as quercetin by a reference standard. Compound **33** was presumed to be quercitrin by a neutral loss of rhamnose moiety at *m*/*z* 303.0496 $[M + H - C_6H_9O_4]^+$ in the MS^2 spectrum, and compound **27** with a neutral loss of a glucose moiety *m*/*z* 301.0338 $[M - H - C_6H_{10}O_5]^-$, tentatively identified compound **27** as quercetin-3*β*-D-glucoside [34].

Two kaempferols **38** and **40** were filtered by *m*/*z* 287 or 285 [23,67]. The molecular formula of compound **38** was $C_{15}H_{10}O_6$ by its precursor ion at *m*/*z* 287.0550 $[M + H]^+$, and it has been identified as kaempferol by combining the mass fragments of literatures and standard. Compound **40** was presumed to be kaempferol 3-O-*α*-L-arabinopyranosyl-7-O-*α*-L-rhamnopyranoside[23,67, 70, 71]. It presented a formula of $C_{26}H_{28}O_{14}$ and showed a neutral loss of a glucose moiety and an arabinopyranosyl moiety *m*/*z* 284.0316 $[M - C_6H_8O_4 - C_5H_{10}O_4 - H]^-$.

Two dihydroflavones **19** and **26** were identified. Compound **19** showed a precursor ion *m*/*z* 305.0662 $[M + H]^+$ and its molecular formula was $C_{15}H_{12}O_7$, and also showed *m*/*z* 287.0573 [M − H_2O + H]⁺, *m*/*z* 257.0591 [M − CO − H_2O + H]⁺ and *m*/*z* 153.0188 [M − CO − $C_7H_8O_2$ + H]⁺, thus compound **19** was putatively identified as taxifolin [12]. Compound **26** produced a precursor ion *m*/*z* 417.1177 [M +

H]$^+$ that suggested a molecular formula of $C_{21}H_{22}O_9$, and also showed a neutral loss of a glucose moiety *m*/*z* 301.0338 [M − $C_6H_{10}O_5$ − H]$^-$ and 153.0187 [M − $C_6H_{10}O_5$ – CO − $C_7H_6O_2$ − H]$^-$, thus compound **26** was putatively identified as 2-(4-hydroxyphenyl)-7-((3,4,5-trihydroxy-6-(hydroxymethyl) tetrahydro-2H-pyran-2 -yl) oxy) chroman-4-one [67, 12].

S3. Identification of other coumarin

Compound **43** showed the similar fragmentation behaviours and fragment ions as **31**, but compound **43** had a molecular formula of $C_{16}H_{18}O_8$ by a precursor ion at *m*/*z* 339.1075 [M + H]$^+$, and showed a neutral loss of a glucose moiety and a CH_3 that formed *m*/*z* 177.0546 [M + H − $C_6H_{10}O_5$]$^+$ and *m*/*z* 145.0284 [M − $C_6H_{10}O_5$ − CH_3 – OH + H]$^+$, thus compound **43** was tentatively identified as 4-methylumbelliferyl-*α*-D- glucopyranoside by database.

S4. Identification of other Lignans

Three lignans (**20**, **22** and **23**) were filtered by *m*/*z* 419 or 420 [21]. Compounds **20**, **22** and **23** showed precursor ions *m*/*z* 581.2209 [M − H]$^-$, *m*/*z* 419.1694 [M − H]$^-$ and 551.2105 [M − H]$^-$, which suggested molecular formulas of $C_{28}H_{38}O_{13}$, $C_{22}H_{28}O_8$ and $C_{27}H_{36}O_{12}$, and showed the filtering ions at *m*/*z* 419.1691 [M − $C_6H_{10}O_5$ − H]$^-$, *m*/*z* 419.1694 [M − H]$^-$ and *m*/*z* 419.1650 [M − $C_5H_{10}O_4$ − H]$^-$ and showed the common ions at *m*/*z* 373.1272 [M − $C_6H_{10}O_5$ − 3CH_3 − H]$^-$ and 359.1110 [M − $C_6H_{10}O_5$ − 4CH_3 − H]$^-$, or *m*/*z* 373.1277 [M − 3CH_3 − H]$^-$ and *m*/*z* 359.1119 [M − 4CH_3 − H]$^-$, or *m*/*z* 373.1272 [M − $C_6H_{10}O_5$ − 3CH_3 − H]$^-$ and *m*/*z* 359.1110 [M − $C_6H_{10}O_5$ − 4CH_3 − H]$^-$, hence compounds **20**, **22** and **23** were tentatively identified as lyoniresinol-3a-O-*β*-D-glucopyranosid, (-)-lyoniresinol and lyoniside [33,42].

Compound **28** had a molecular formula of $C_{20}H_{22}O_4$ by the ion peak at *m*/*z* 327.1593 [M + H]$^+$, and showed the fragment ions at *m*/*z* 295.1328 [M − OCH_2 + H]$^+$ and *m*/*z* 163.0753 [M − $C_{10}H_{12}O_2$ + H]$^+$, thus compound **28** was tentatively identified as 2-[1-(2H-1, 3-benzod ioxol-5-yl) propan-2-yl]-6-methoxy-4-(prop-2-en-1-yl) phenol [33,42].

S5. Identification of terpenoids

A total of six terpenoids were discovered, including compounds **35**, **36**, **44**, **57**.

Compound **35** was tentatively identified as libertellenone B. It presented a formula of $C_{20}H_{26}O_4$ and produced several main fragment ions at *m/z* 331.1902 $[M + H]^+$, *m/z* 313.1796 $[M - H_2O + H]^+$, *m/z* 165.0911 $[M - C_{10}H_{14}O_2 + H]^+$ and *m/z* 125.0565 $[M - C_{12}H_{14}O_3 + H]^+$. Compound **36** possessed a molecular formula of $C_{17}H_{20}O_3$ by the ion peak at *m/z* 273.1488 $[M + H]^+$, *m/z* 255.1391 $[M - H_2O + H]^+$, and showed *m/z* 227.1441 $[M - H_2O - CO + H]^+$, *m/z* 149.0964 $[M - CH_3 - C_6H_6O_2 + H]^+$ and *m/z* 82.8045 $[M - C_{11}H_{10}O_3 + H]^+$, thus compound **36** was tentatively identified as 3(2H)-phenanthrenone, 1, 9, 10, 10a-tetrahydro-2, 6-dihydroxy-1, 1, 7-trimethyl by the mass information of database. Compound **44** with a molecular formula of $C_{15}H_{20}O_4$ by *m/z* 265.1481 $[M + H]^+$, produced the fragment ions at *m/z* 247.1332 $[M - H_2O + H]^+$, *m/z* 229.1216 $[M - 2H_2O + H]^+$ and *m/z* 187.1108 $[M - O - CH_2 - COO + H]^+$, thus compound **44** was tentatively identified as (±)-abscisic acid by the mass information of database. Compound **57** had a molecular formula of $C_{15}H_{20}O_4$ by the ion peak at *m/z* 221.1900 $[M + H]^+$, and showed the fragment ions at *m/z* 175.1483 $[M - O - 2CH_2 - C + H]^+$, *m/z* 161.1323 $[M - 2CH_3 - C - CH - O + H]^+$ and *m/z* 147.1167 $[M - 2CH_3 - C - CH - CH_2 - O + H]^+$. Therefore, compound **57** was tentatively identified as (-)-caryophyllene oxide by the mass information of database.

S6. Identification of organic acids

A total of 11 organic acids were discovered, including compounds **8**, **13**, **17**, **24**, **37**, **39**, **47**, **50**, **51**, **56**. Compound **8** had a molecular formula of $C_{13}H_{14}O_5$ by the ion peak at *m/z* 251.0915 $[M + H]^+$, and showed *m/z* 233.0804 $[M - H_2O + H]^+$, *m/z* 221.0807 $[M - 2CH_3 + H]^+$ and *m/z* 205.0857 $[M - H_2O - CO + H]^+$, thus compound **8** was putatively identified as citrinin by the mass information of database. Compound **17** showed a molecular formula of $C_{26}H_{40}O_{12}$ by the ion peak at *m/z* 543.2421 $[M - H]^-$, and showed *m/z* 525.2305 $[M - H_2O - H]^-$ and 363.1800 $[M - H_2O - C_6H_{10}O_5 - H]^-$, thus compound **17** should be picconioside B by the mass information of database. Compound **24** had the ion peak at *m/z* 177.0545 $[M + H]^+$, which indicated a molecular formula of $C_{10}H_8O_3$ and showed *m/z* 149.0596 $[M - CO + H]^+$, *m/z* 133.0646 $[M - COO + H]^+$, *m/z* 105.0693 $[M - CO - COO + H]^+$, *m/z* 93.0098 $[M - CO - COO - C + H]^+$ and *m/z* 81.0700 $[M - CO - COO - 2C + H]^+$, thus compound **24** was putatively identified as 3-oxoindane-1-carboxylic acid by the mass information of database. Compound **37** showed the precursor ion at *m/z* 187.0966 $[M - H]^-$, which indicated a formula of $C_9H_{16}O_4$, was tentatively identified as 3-oxoindane-1-carboxylic acid [47], it produced similar fragment ions at *m/z* 125.0966 $[M - COOH - OH - H]^-$ and *m/z* 97.0654 $[M - 2COOH - H]^-$. Compound **39** possessed a

molecular formula of $C_9H_{14}O_4$, and showed the ion peaks at *m/z* 185.0819 $[M - H]^-$, *m/z* 141.0916 $[M - COO - H]^-$ and *m/z* 104.0775 $[M - C_6H_9 - H]^-$, thus compound **39** was tentatively identified as 1-(carboxymethyl) cyclohexanecarboxylic acid by the mass information of database. Compound **47** showed the precursor ion at *m/z* 201.1120 $[M - H]^-$, with a molecular formula of $C_{10}H_{18}O_4$ by , and showed *m/z* 183.1020 $[M - OH - H]^-$ and *m/z* 156.8982 $[M - COO - H]^-$, hence compound **47** was putatively identified as 3-tert-butyladipic acid by the mass information of database. Compound **50** was tentatively identified as 9*S*, 13*R*-12-oxophytodienoic acid [72]. It presented a formula of $C_{18}H_{28}O_3$ and produced several main fragment ions at *m/z* 293.2104 $[M + H]^+$, *m/z* 275.2003 $[M - H_2O + H]^+$, *m/z* 239.1799 $[M - C_4H_6 + H]^+$, *m/z* 147.1163 $[M - C_7H_{14} + H]^+$ and *m/z* 81.0698 $[M - C_{12}H_{20}O_3 + H]^+$. Compound **51** had the ion peak at *m/z* 327.2165 $[M - H]^-$, which suggested a molecular formula of $C_{18}H_{32}O_5$, and showed *m/z* 242.9845 $[M - C_5H_4 - OH - H]^-$, *m/z* 171.1019 $[M - C_9H_{16}O_2 - H]^-$ and *m/z* 85.0291 $[M - C_{13}H_{22}O_4 - H]^-$, thus compound **51** was tentatively identified as corchorifatty acid F [51]. The mass fragmentation of compound **56** was basically accordant with that of **51**, except that all the ion peaks of **56** were 2 *m/z* value larger than those of **51**, which indicated a less of one double bond. Thus, compound **56** was tentatively identified as 3-tert-butyladipic acid [51].

S7. Identification of others

Compound **12** was identified as 2, 4, 6-trihydroxy-2-(4-hydroxybenzyl) -1-benzofuran-3(2H)-one with *m/z* 287.0551 $[M - H]^-$ ($C_{15}H_{12}O_6$), and fragmentions at *m/z* 161.0233 $[M - C_6H_6O_3 - H]^-$ and *m/z* 125.0239 $[M - C_8H_2O_4 - H]^-$. Compound **30** was tentatively identified as 6-hydroxy-8-methoxy-3-methyl-3, 4-dihydro -1H-isochromen-1-one. It presented a formula of $C_{11}H_{12}O_4$ and produced several main fragment ions at *m/z* 209.0802 $[M + H]^+$, *m/z* 149.0596 $[M - COOCH + H]^+$ and *m/z* 121.0647 $[M - 2OH - OCH_3 - CO + H]^+$. Compound **34** had a molecular formula of $C_{26}H_{28}O_{15}$ by the ion peak at *m/z* 579.1325 $[M - H]^-$, and exhibited *m/z* 417.1531 $[M - C_6H_{10}O_5 - H]^-$, *m/z* 300.0259 $[M - C_6H_8O_4 - C_5H_{10}O_4 - H]^-$, *m/z* 271.0235 $[M - C_{11}H_{16}O_{10} - H]^-$ and *m/z* 178.9979 $[M - C_{17}H_{20}O_{11} - H]^-$, thus compound **34** was tentatively identified as graveobioside A [42]. Compound **54** had a molecular formula of $C_{10}H_8O$ by the ion peak at *m/z* 145.0647 $[M + H]^+$, showed *m/z* 116.0575 $[M - C - OH + H]^+$, *m/z* 102.0468 $[M - C_2H_2 - OH + H]^+$ and *m/z* 91.0539 $[M - C_3H_2 - OH + H]^+$, thus compound **54** was tentatively identified as 1-naphthol by the published literature [53]. Compound **58** was tentatively identified as 4-methoxychalcone [73]. It presented a formula of

$C_{16}H_{14}O_2$ and produced several main fragment ions at *m*/*z* 239.1073 $[M + H]^+$, *m*/*z* 161.0595 $[M - C_6H_6 + H]^+$, *m*/*z* 133.0647 $[M - C_7H_6O + H]^+$ and *m*/*z* 105.0333 $[M - C_6H_6 - C_2H - OCH_3 + H]^+$.