

Phytochemical Profiling and Biological Activities of Extracts from Bioreactor-Grown Suspension Cell Cultures of *Schisandra henryi*

Karolina Jaferník¹, Adam Kokotkiewicz², Michał Dziurka³, Aleksandra Kruk⁴, Anna Hering⁵, Krzysztof Jędrzejewski², Piotr Waligórski³, Piotr Graczyk⁵, Paweł Kubica¹, Justyna Stefanowicz-Hajduk⁵, Sebastian Granica⁴, Maria Łuczkiwicz² and Agnieszka Szopa^{1,*}

¹ Department of Medicinal Plant and Mushroom Biotechnology, Jagiellonian University, Medical College, ul. Medyczna 9, 30-688 Kraków, Poland; karolina.jaferník@doctoral.uj.edu.pl (K.J.); p.kubica@uj.edu.pl (P.K.)

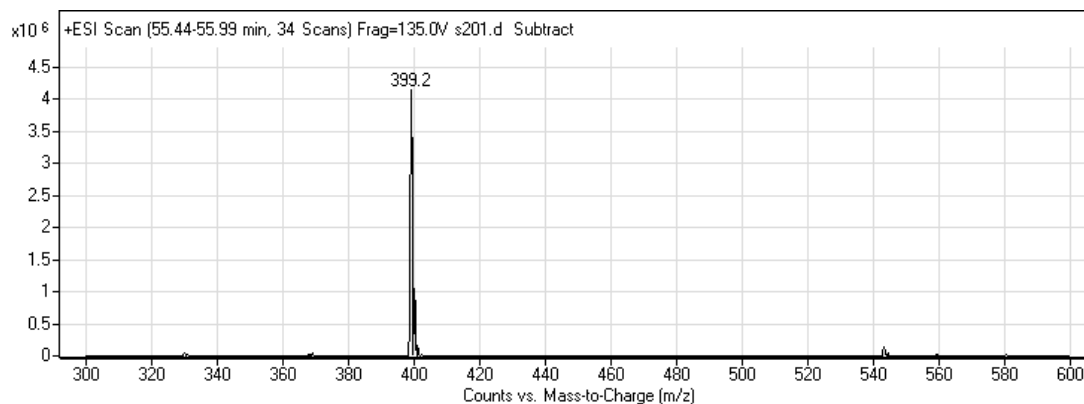
² Department of Pharmacognosy, Medical University of Gdańsk, Al. Generała Józefa Hallera 107, 80-416 Gdańsk, Poland; adam.kokotkiewicz@gumed.edu.pl (A.K.); jedrzejewski.k.j@gumed.edu.pl (K.J.); maria.luczkiwicz@gumed.edu.pl (M.L.)

³ Polish Academy of Sciences, The Franciszek Górski Institute of Plant Physiology, ul. Niezapominajek 21, 30-239 Kraków, Poland; michal.dziurka@gmail.com (M.D.); p.waligorski@ifr-pan.edu.pl (P.W.)

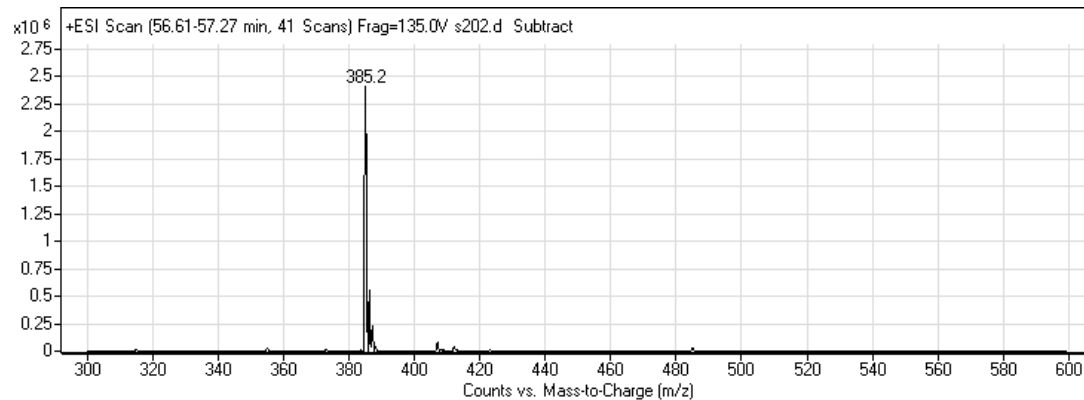
⁴ Microbiota Lab, Department of Pharmaceutical Biology, Medical University of Warsaw, ul. Banacha 1, 02-097 Warszawa, Poland; aleksandra.kruk@wum.edu.pl (A.K.); sebastian.granica@wum.edu.pl (S.G.)

⁵ Department of Biology and Pharmaceutical Botany, Faculty of Pharmacy, Medical University of Gdańsk, Al. Generała Józefa Hallera 107, 80-416 Gdańsk, Poland; anna.hering@gumed.edu.pl (A.H.); piotr.graczyk@gumed.edu.pl (P.G.); justyna.stefanowicz-hajduk@gumed.edu.pl (J.S.-H.)

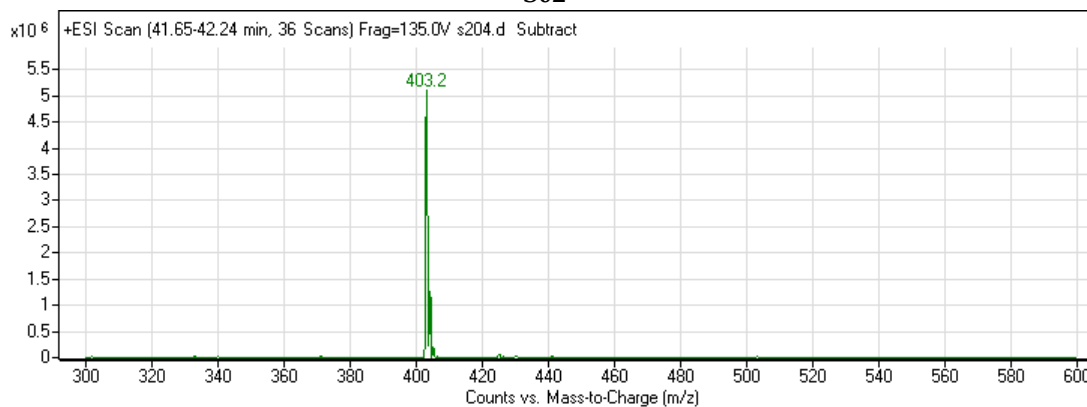
* Correspondence: a.szopa@uj.edu.pl



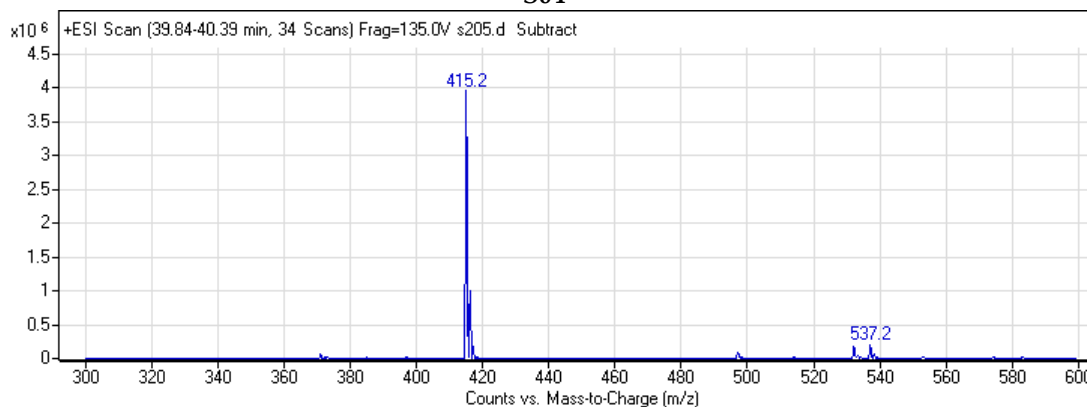
S01



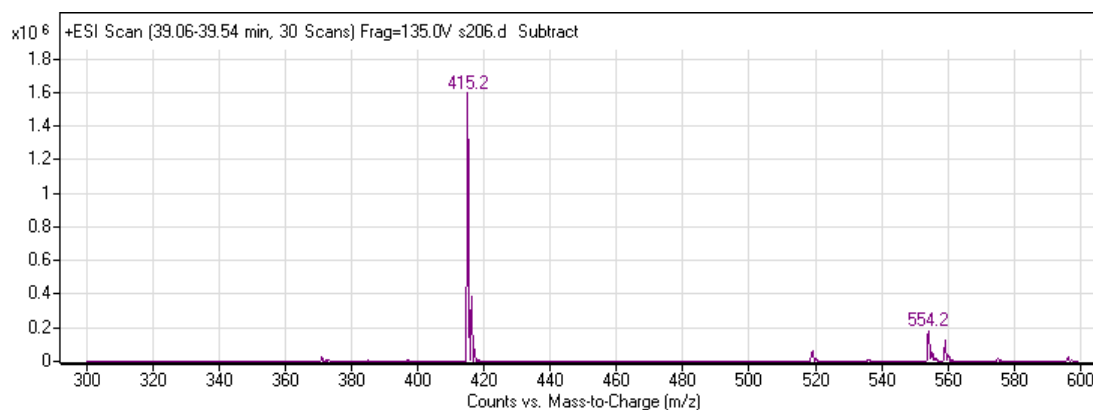
S02



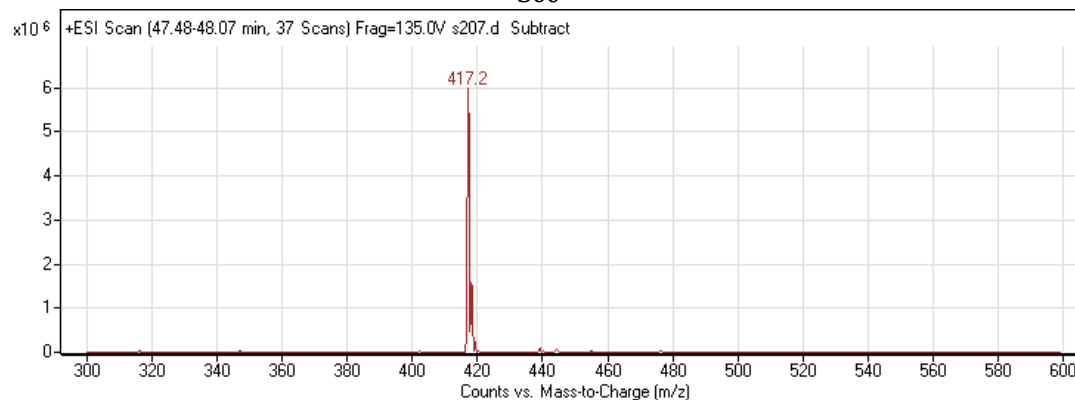
S04



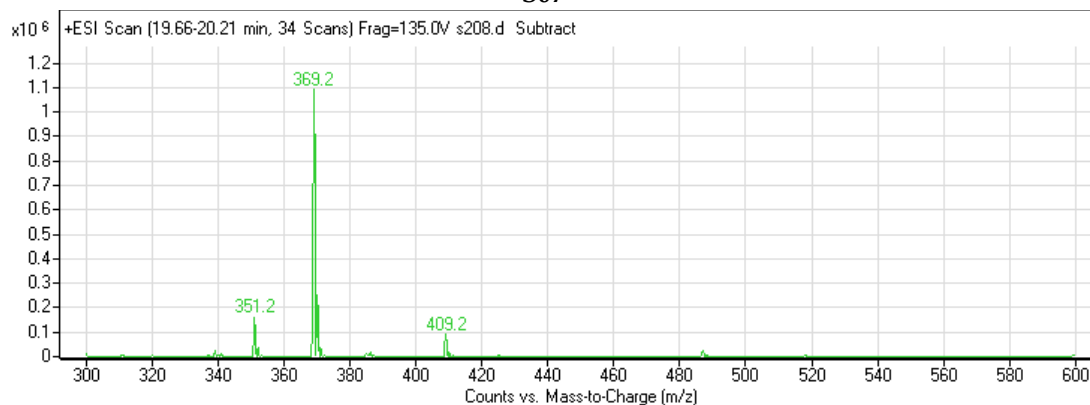
S05



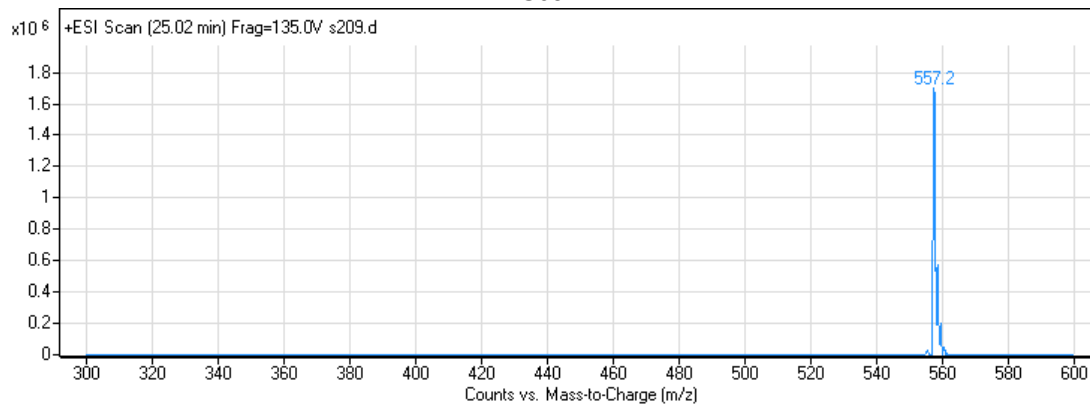
S06



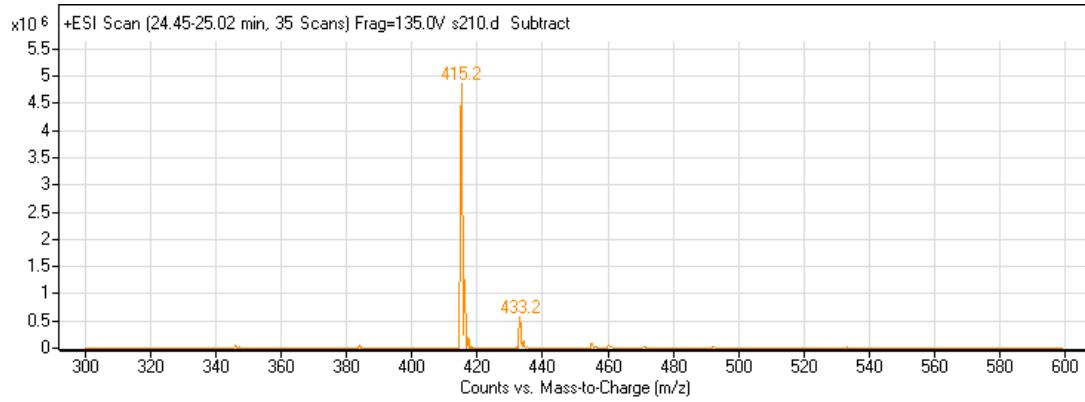
S07



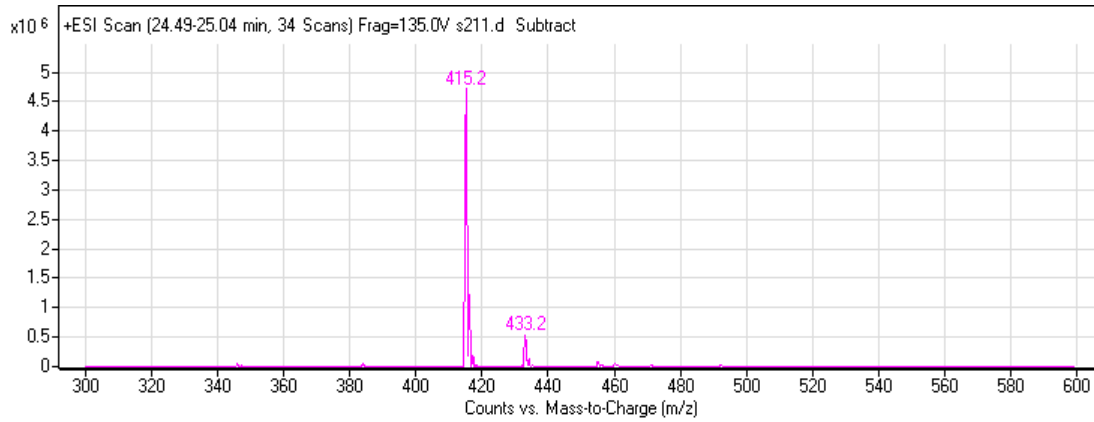
S08



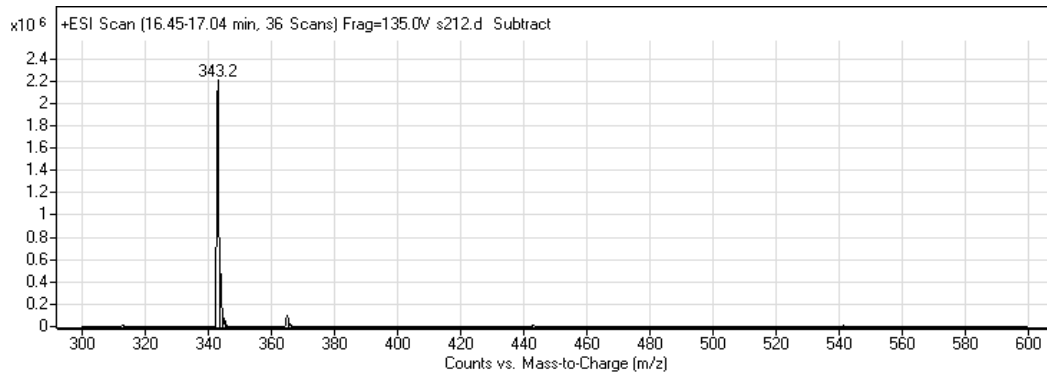
S09



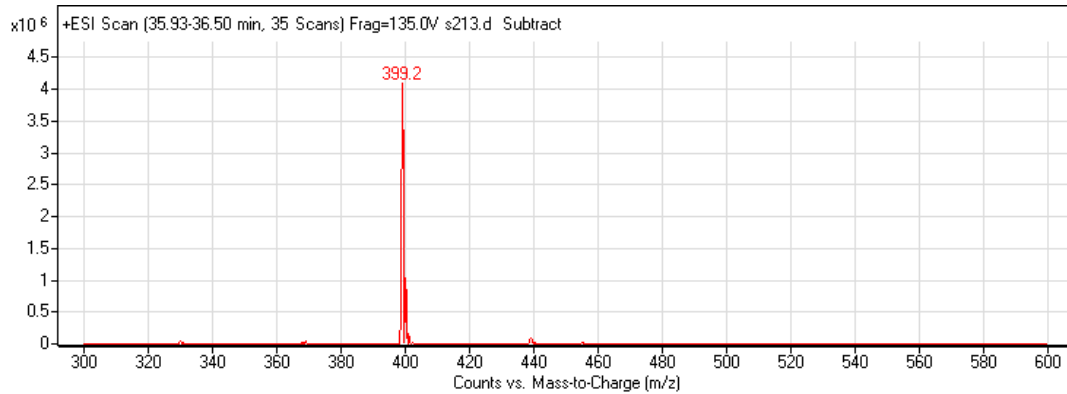
S10



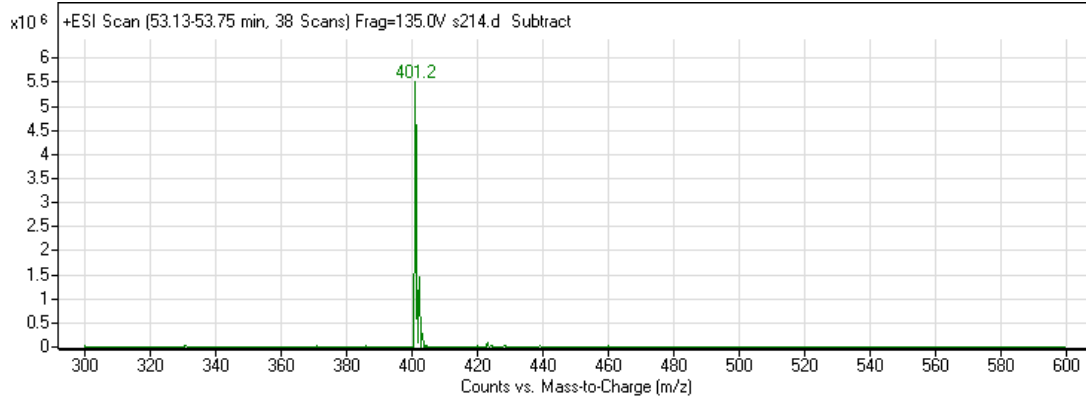
S11



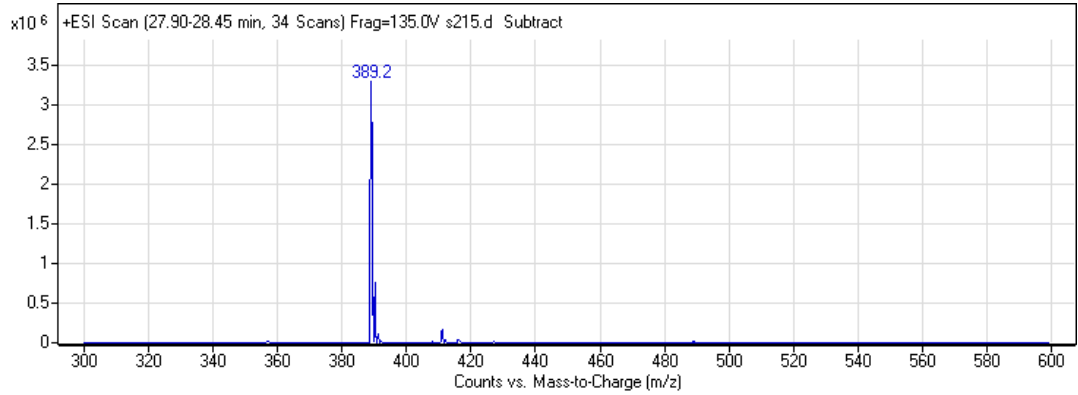
S12



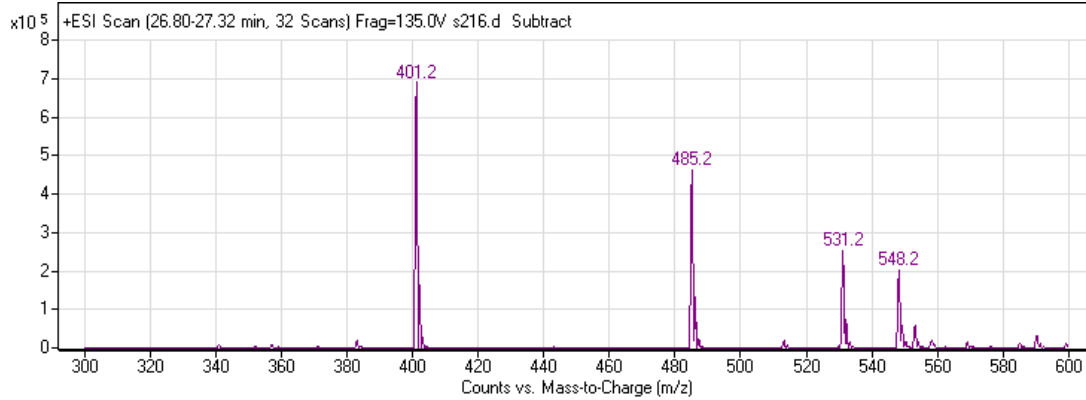
S13



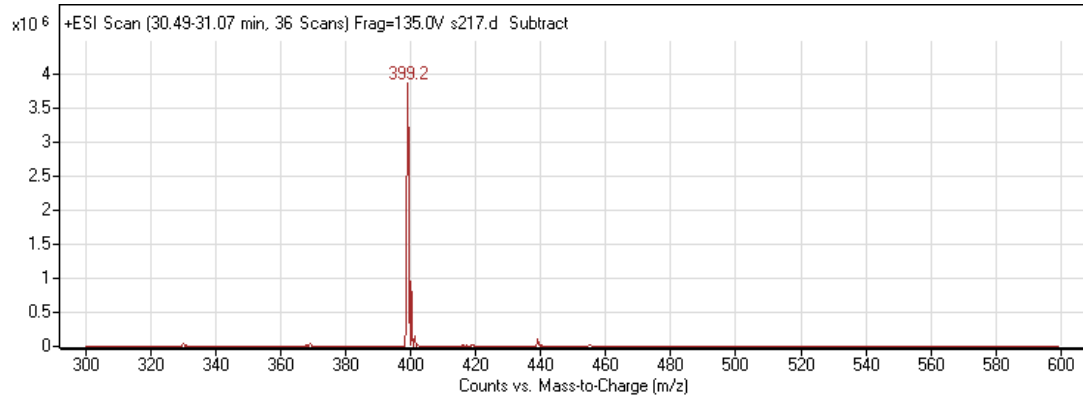
S14



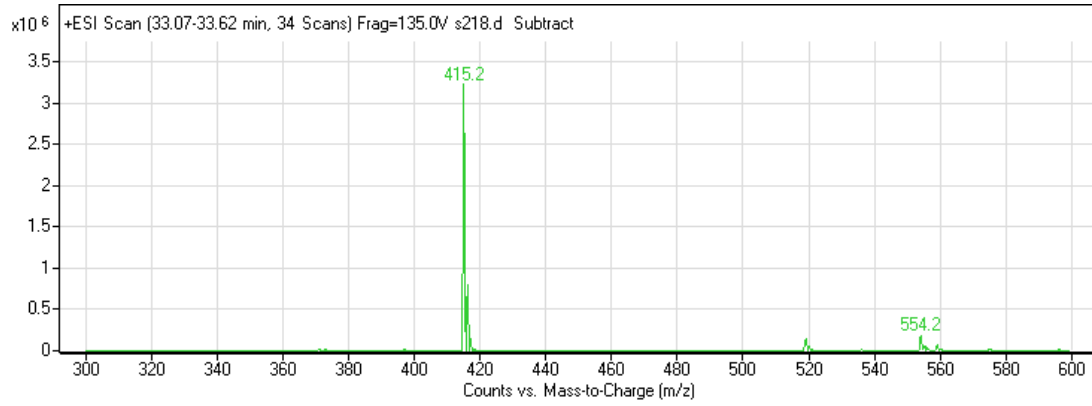
S15



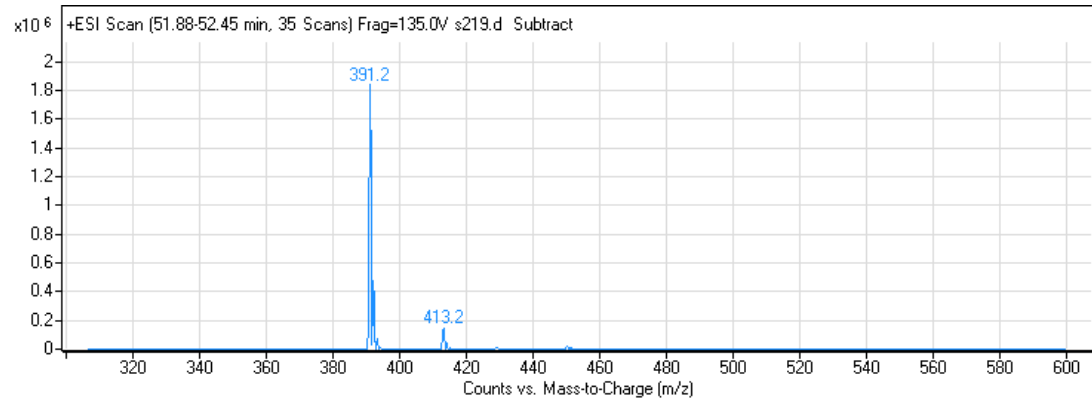
S16



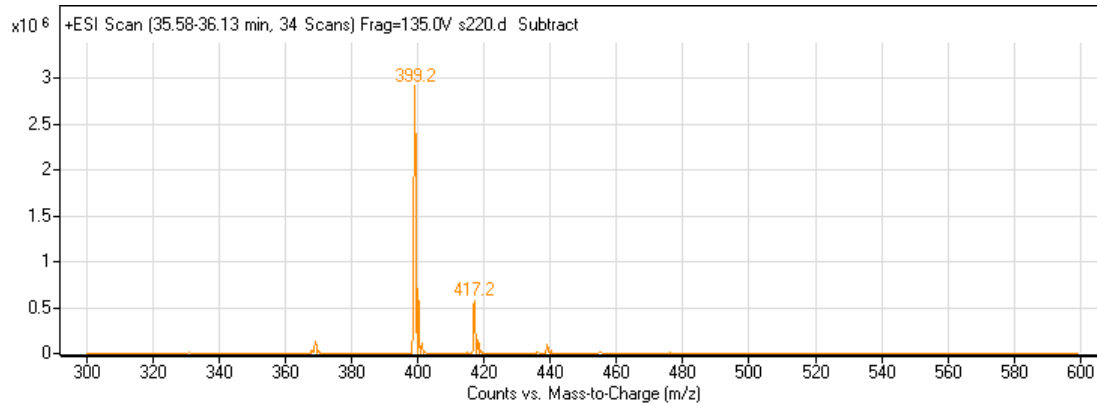
S17



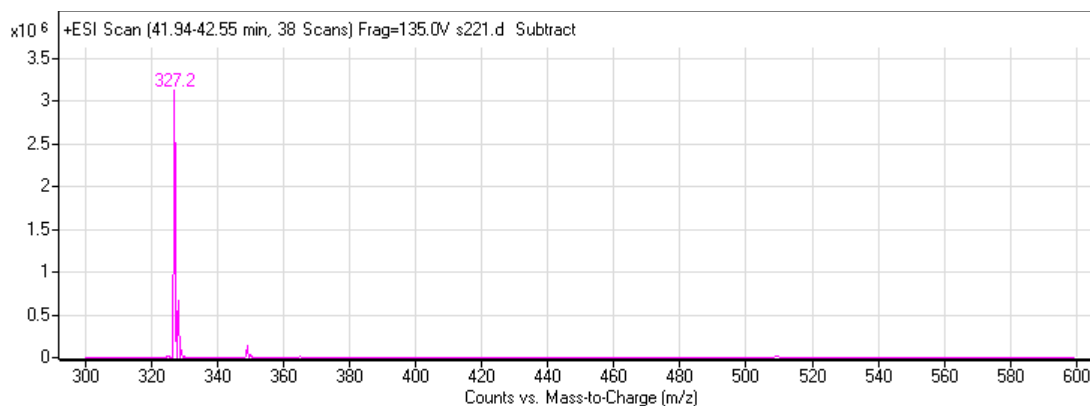
S18



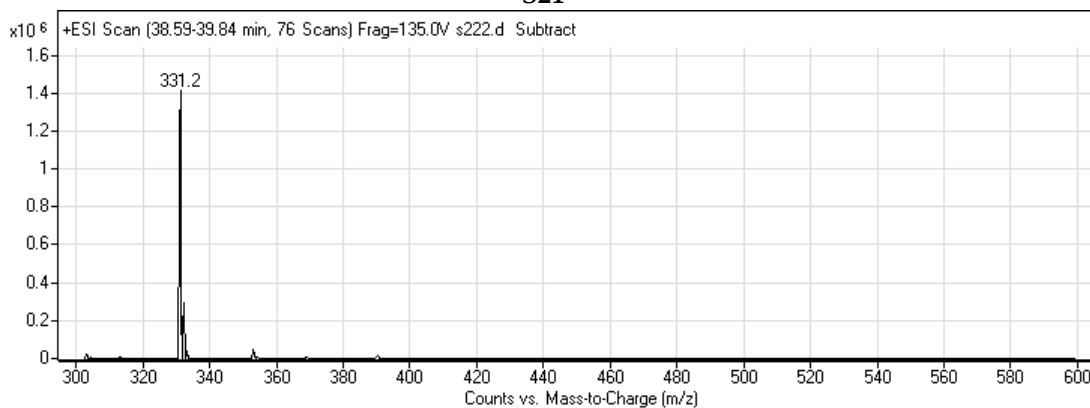
S19



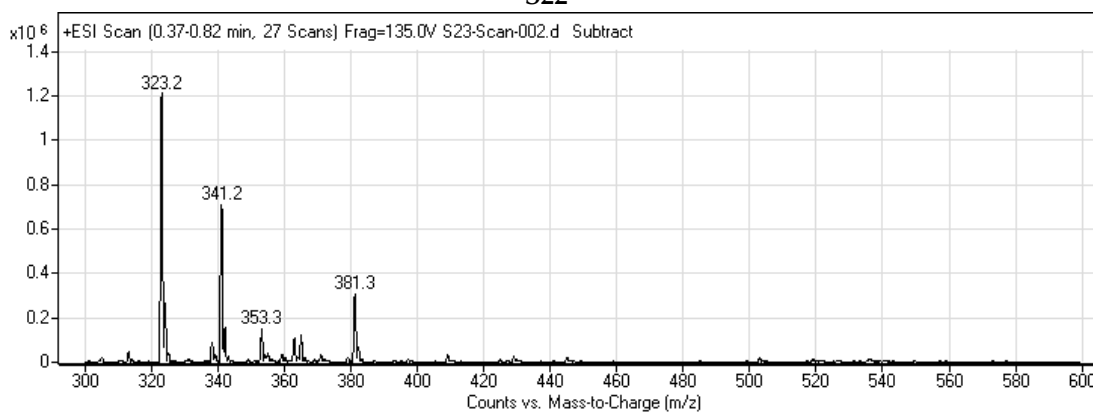
S20



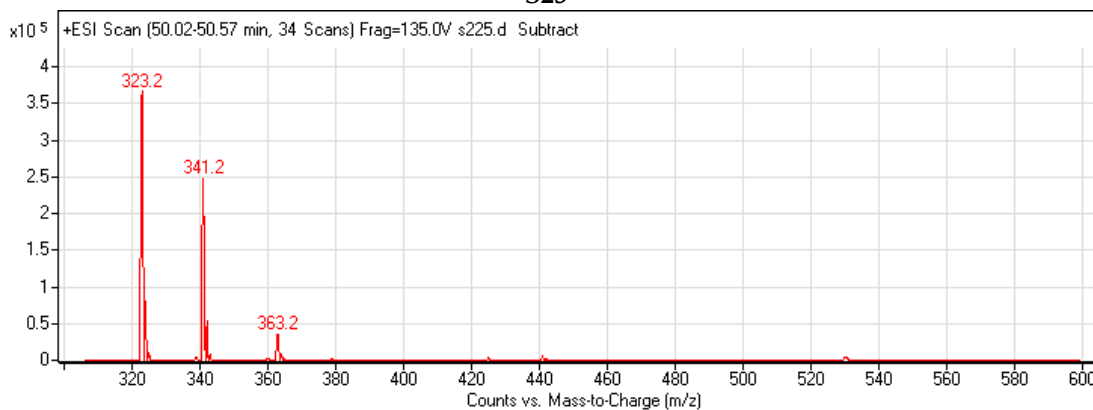
S21



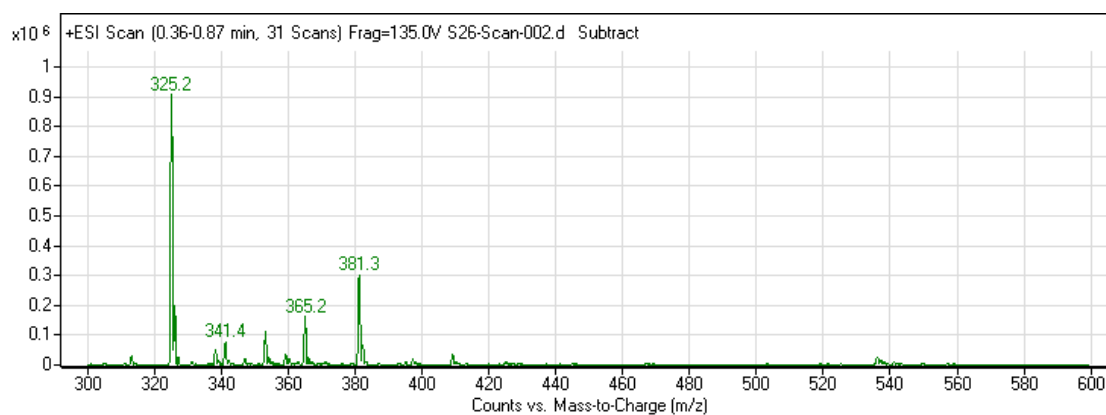
S22



S23



S25



S26

Figure S1. Mass spectra of lignan standards in full scan mode. Ionization conditions applied: positive ionization (+ESI), drying gas temperature - 350°C, gas flow - 12 l/min, nebulizer pressure - 35 psi.

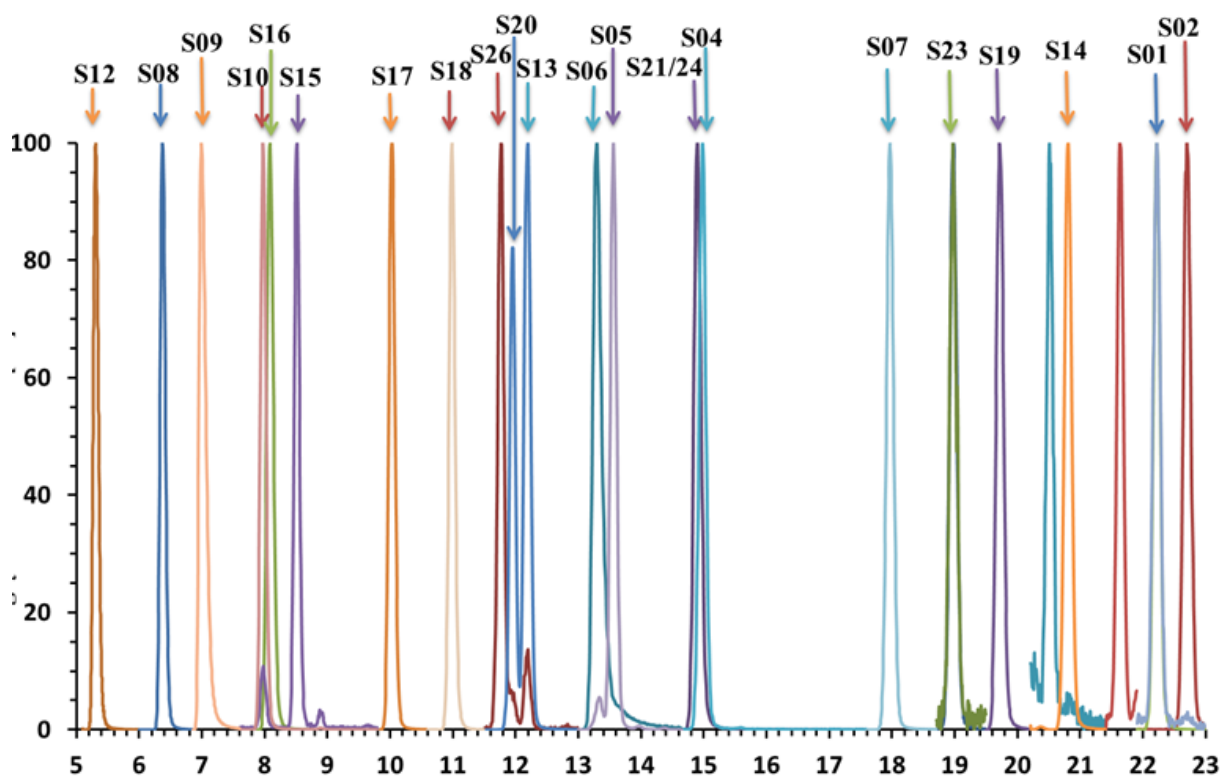
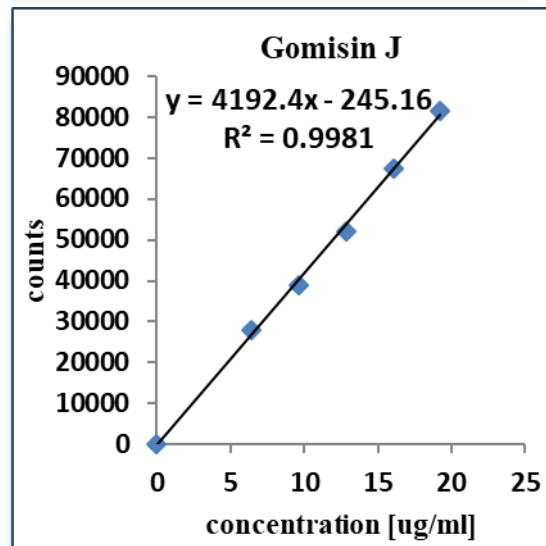
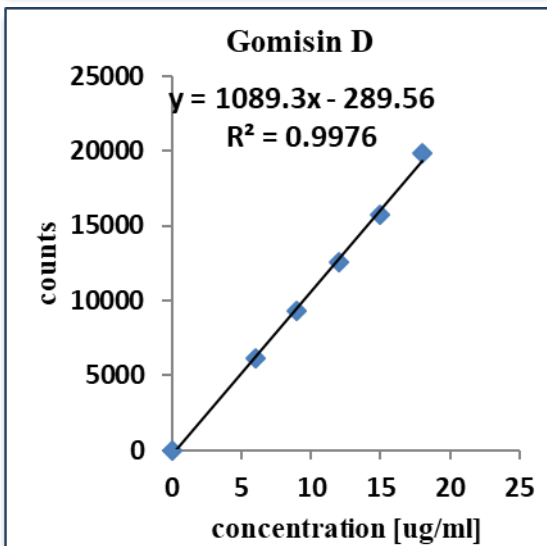
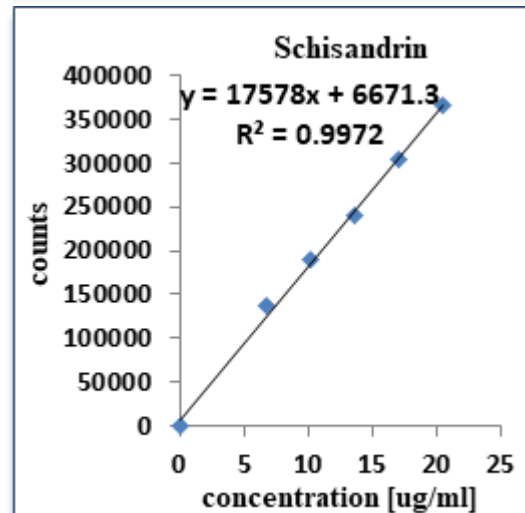
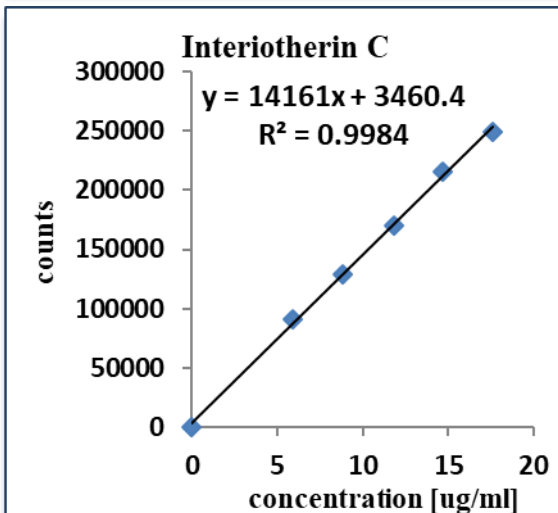
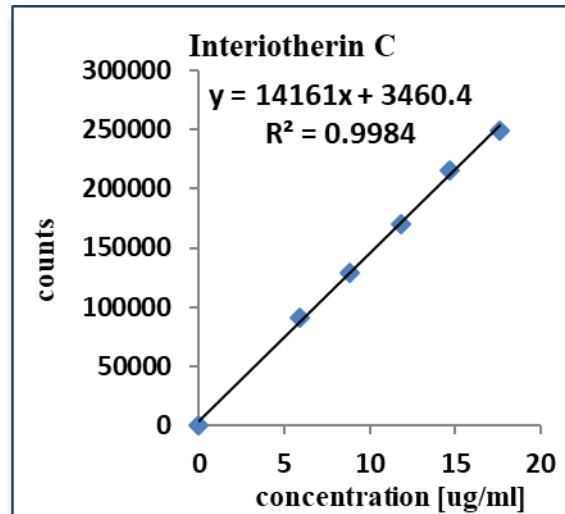
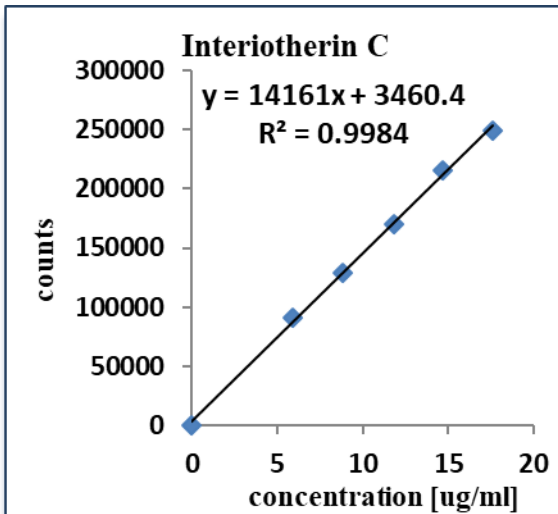
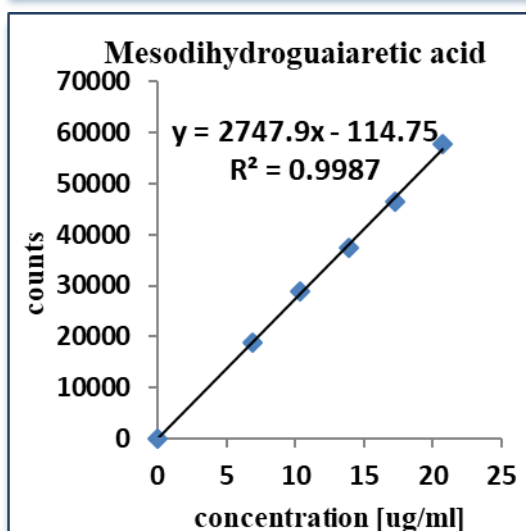
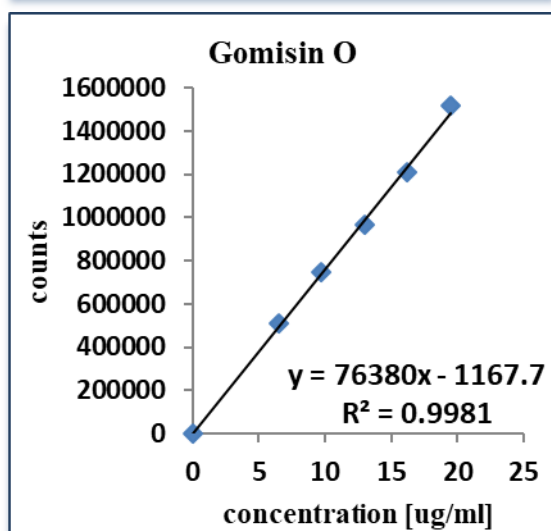
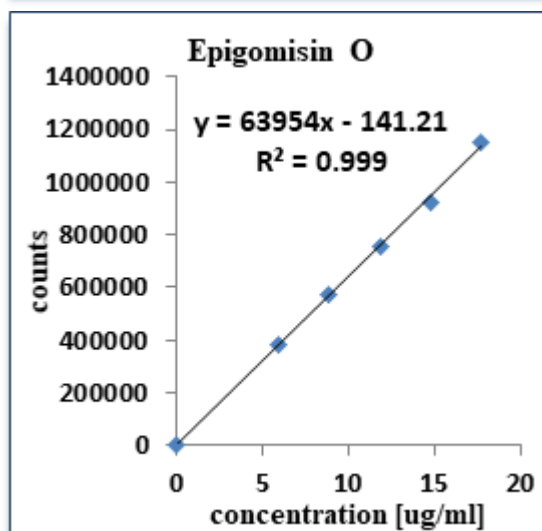
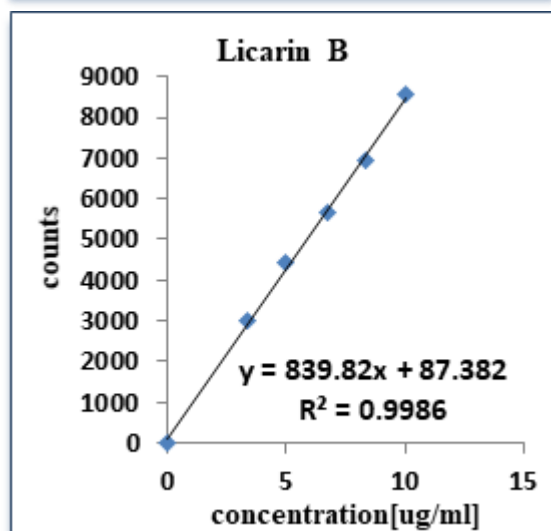
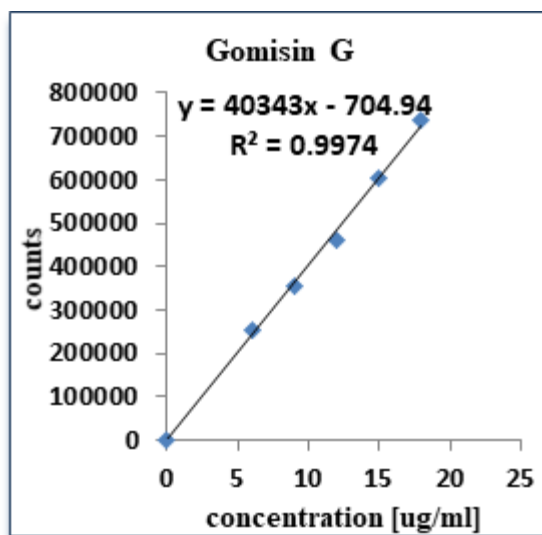
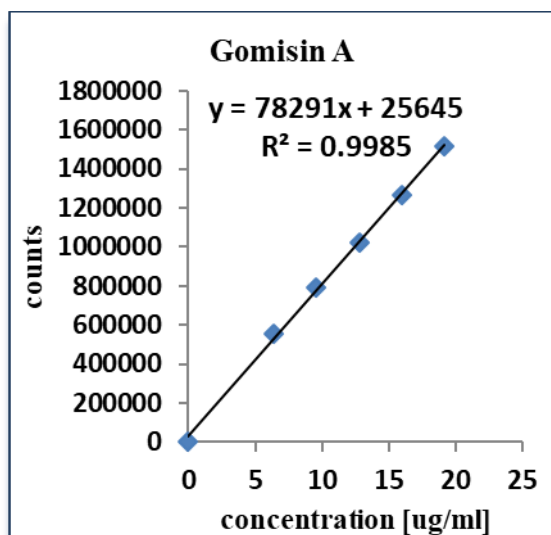


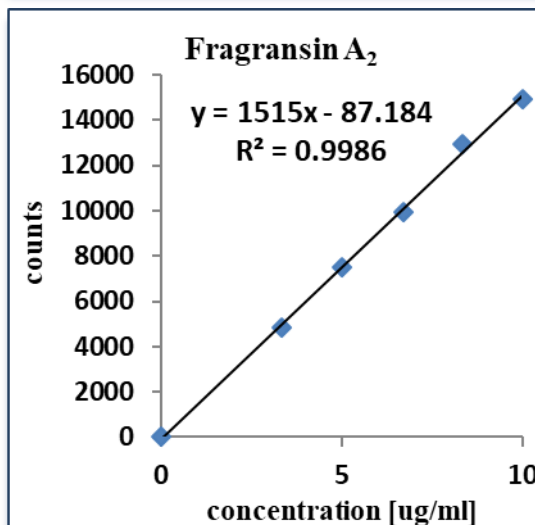
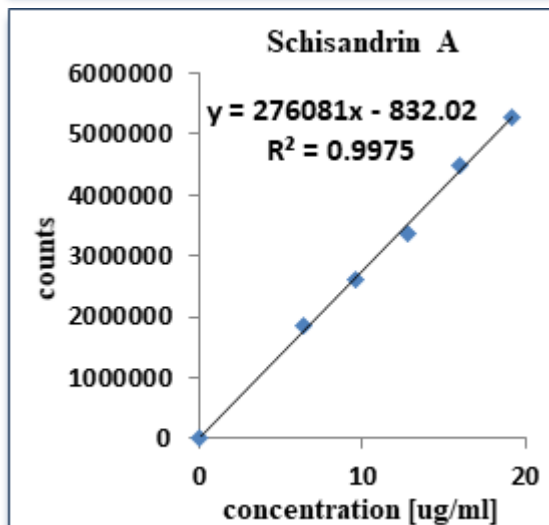
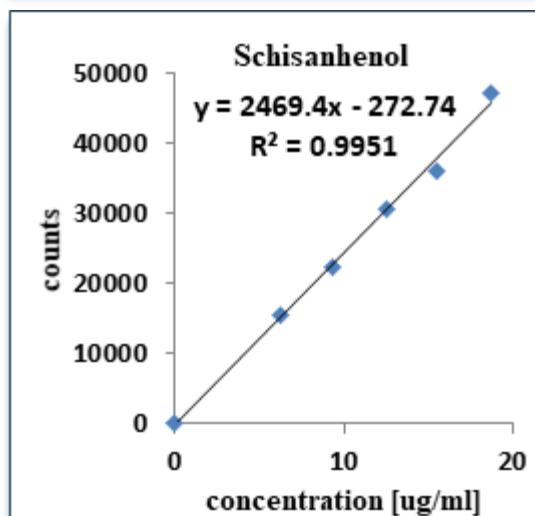
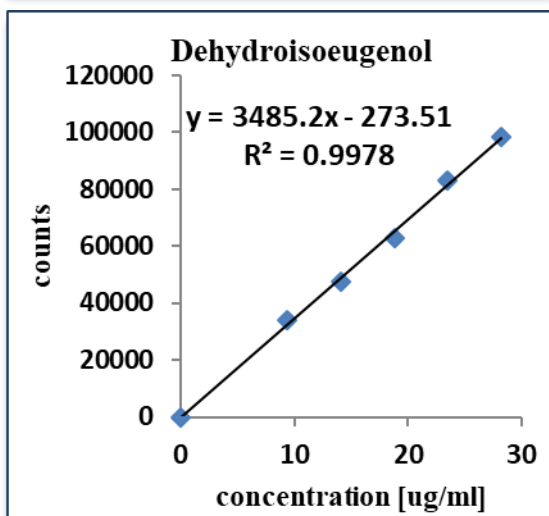
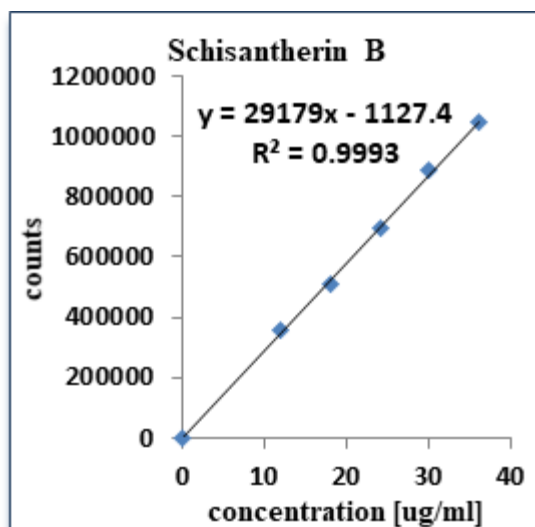
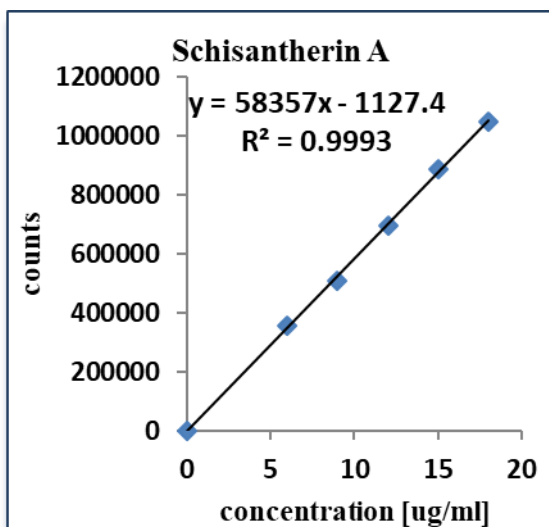
Figure S2. Chromatogram of standard mixture.

Table S1. Monitored lignans and selected experimental parameters

Lignan	Short name	Type of ion	RT [min] C18 column	RT window [min]	MRM transition	RSD% for peaks areas
Wulignan A ₁	S12	[M+H] ⁺	5.31	0.1	343.3\117.0	20
Rubrisandrin A	S08	[M-19] ⁺	6.37	0.1	369.3\351.1	20
Rubriflorin A	S10	[M+H] ⁺	6.99	0.1	557.4\173.0	20
Schisandrin	S09	[M-H ₂ O+H] ⁺	7.97	0.1	415.3\359.2	20
Gomisin D	S16	[M-C ₆ H ₁₀ O ₃ +H] ⁺	8.52	0.1	401.3\168.0	20
Gomisin J	S15	[M+H] ⁺	8.90	0.1	389.3\117.0	20
Pregomisin	S17	[M+H] ⁺	19.71	0.1	391.3\139.0	20
Gomisin N	S18	[M+H] ⁺	20.81	0.1	401.3\168.0	20
Gomisin A	S20	[M-H ₂ O+H] ⁺	10.03	0.1	399.3\368.2	20
Epigomisin O	S13	[M-H ₂ O+H] ⁺	11.95	0.1	399.3\368.2	20
6-O-Benzoylgomisin O	S22	[M-C ₇ H ₆ O ₂ +H] ⁺	22.22	0.1	399.3\368.2	20
Gomisin G	S06	[M-C ₇ H ₆ O ₂ +H] ⁺	10.99	0.1	415.3\371.1	20
Schisantherin A	S05	[M-C ₇ H ₆ O ₂ +H] ⁺	13.56	0.1	415.3\371.1	20
Schisantherin B	S04	[M-C ₅ H ₈ O ₂ +H] ⁺	13.97	0.1	415.3\371.1	20
Licarin B	S21	[M+H] ⁺	11.75	0.1	325.2\152.0	20
Gomisin O	S07	[M-H ₂ O+H] ⁺	12.20	0.1	399.3\368.2	20
Mesodihydroguaiaretic acid	S25	[M+H] ⁺	13.29	0.1	331.3\117.0	20
Dehydroisoeugenol	S19	[M+H] ⁺	14.90	0.1	327.3\105.1	20
Schisanhenol	S14	[M+H] ⁺	14.98	0.1	403.3\231.0	20
Schisandrin A	S01	[M+H] ⁺	17.97	0.1	417.3\316.2	20
Fragransin A ₂	S02	[M-21] ⁺	18.98	0.1	323.2\152.0	20
Schisandrin C	S23	[M+H] ⁺	22.70	0.1	385.3\231.1	20







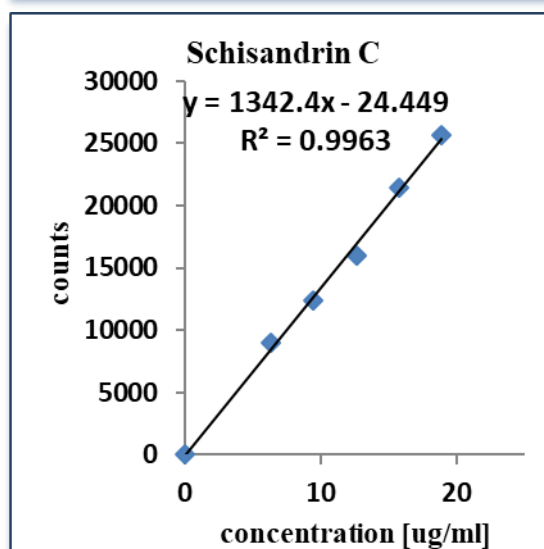
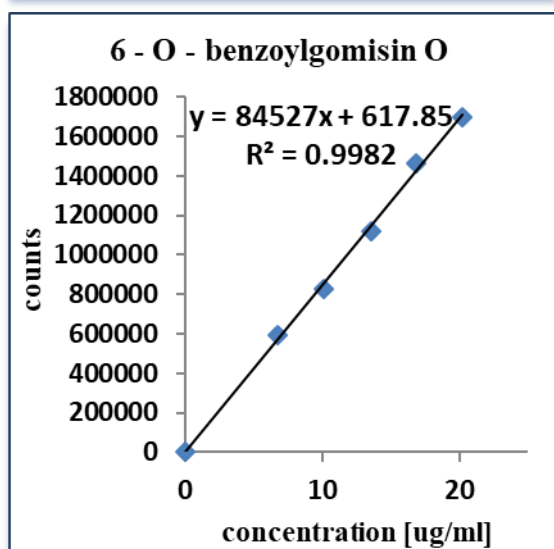
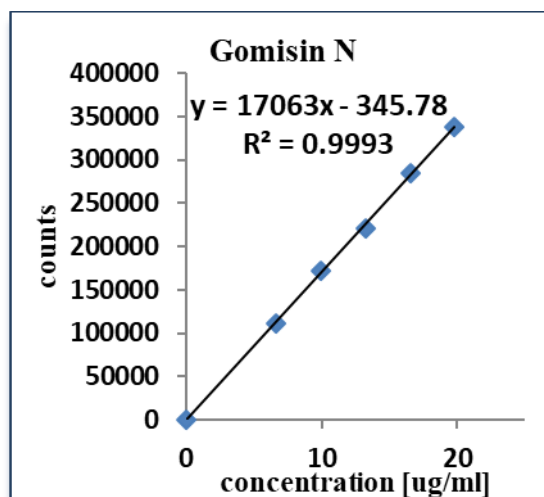
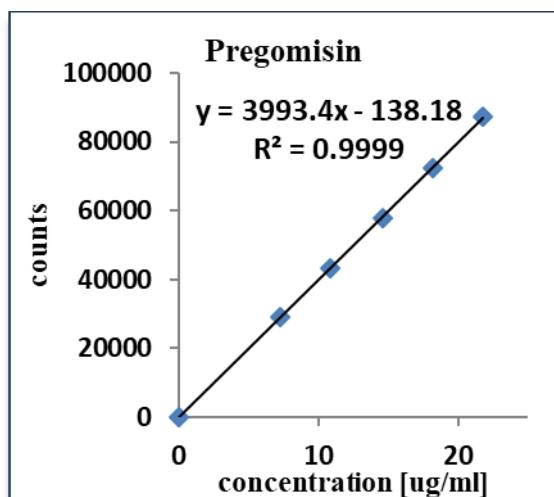


Figure S3. Calibration linearity functions for monitored compounds