

Quality Evaluation of Tetrastigmae Radix from Two Different Habitats Based on Simultaneous Determination of Multiple Bioactive Constituents Combined with Multivariate Statistical Analysis

Haijie Chen¹, Yongyi Zhou¹, Jia Xue¹, Jiahuan Yuan¹, Zhichen Cai¹, Nan Wu¹, Lisi Zou^{1,*}, Shengxin Yin¹, Wei Yang¹, Xunhong Liu^{1,2,*}, Jianming Cheng^{1,2} and Li Tang¹

Supplementary materials

Supplementary figures

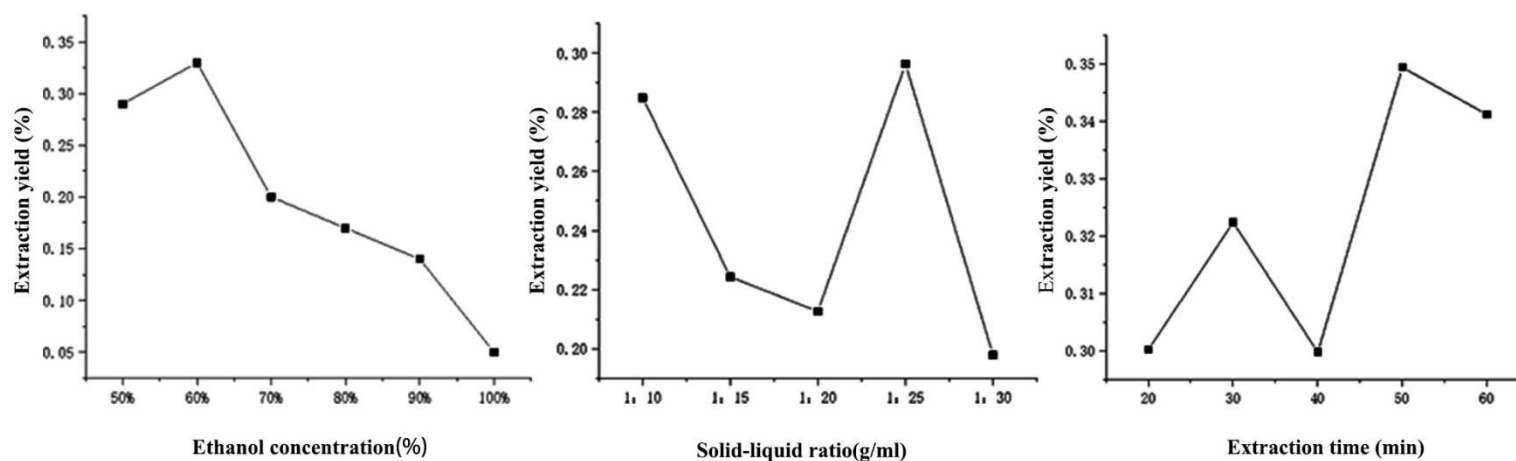
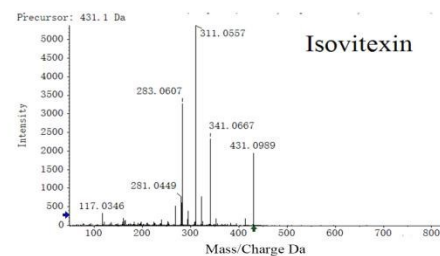
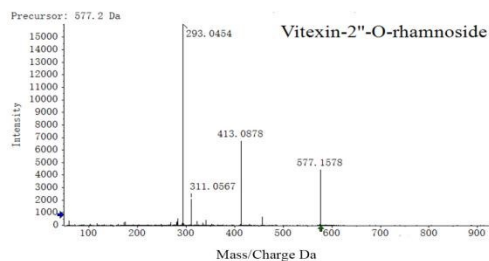
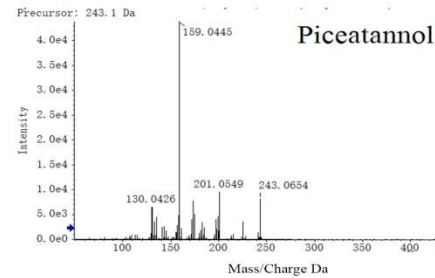
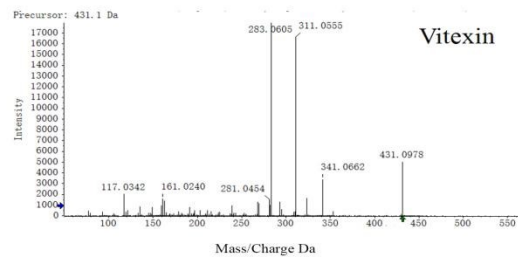
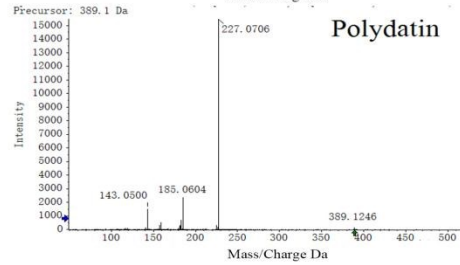
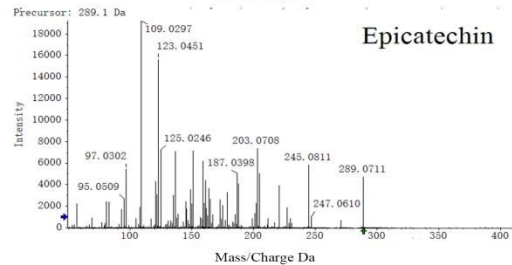
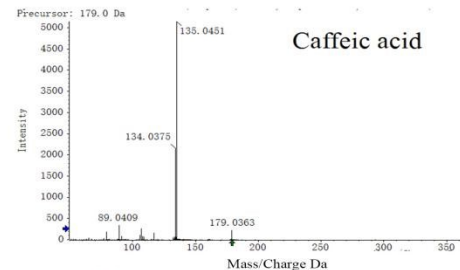
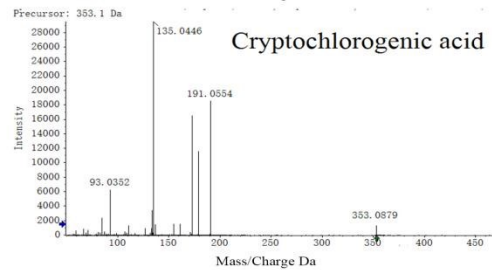
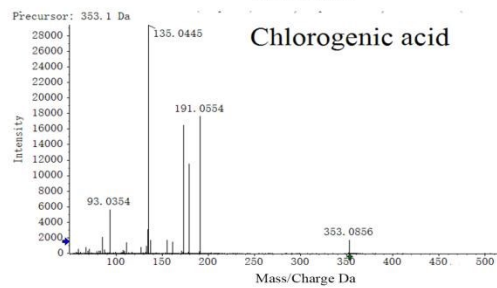
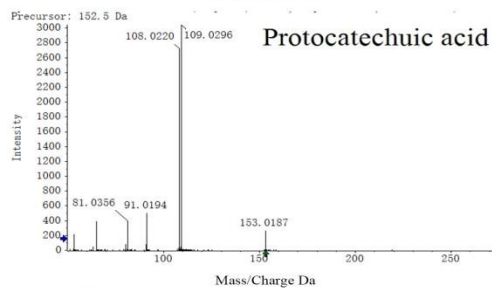
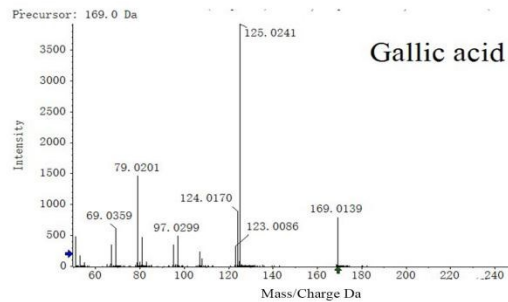
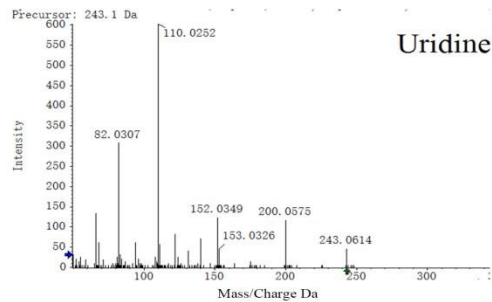
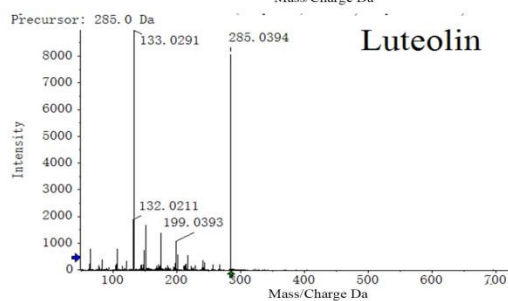
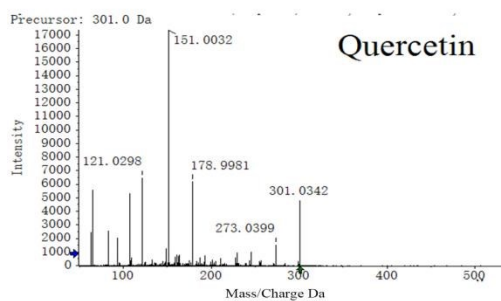
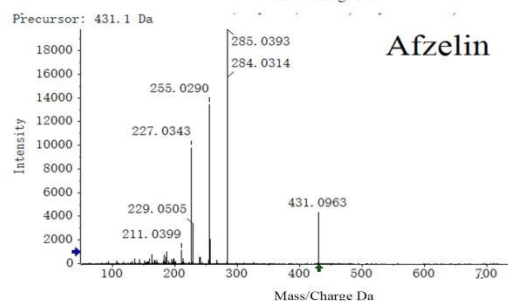
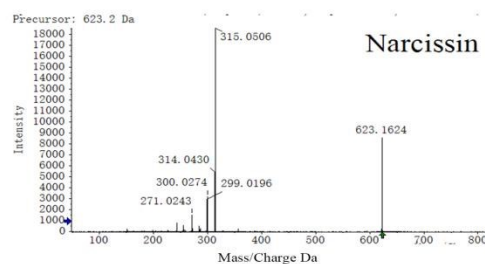
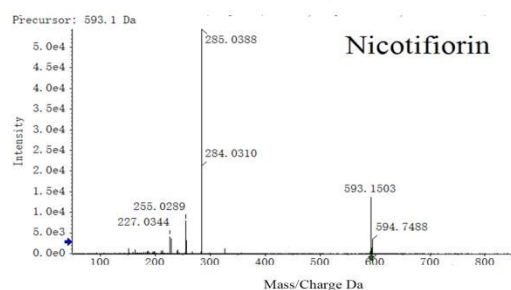
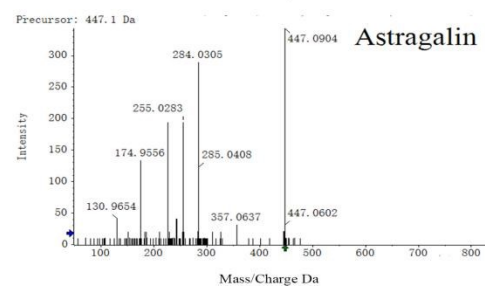
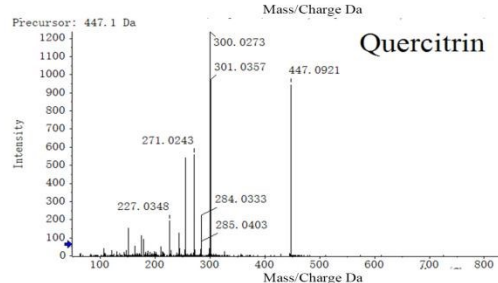
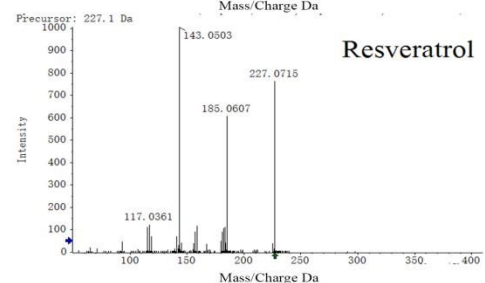
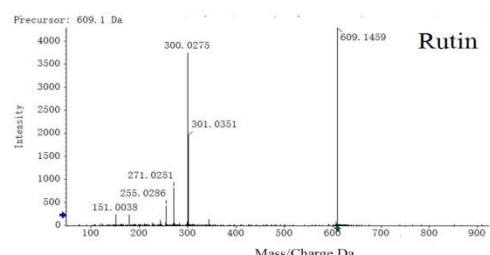
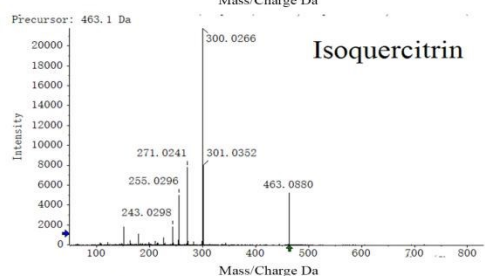
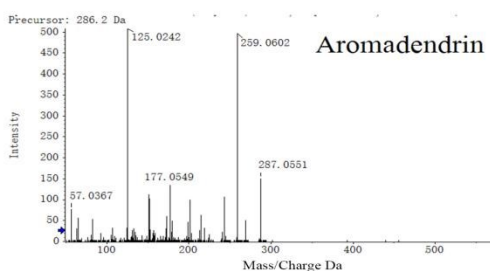
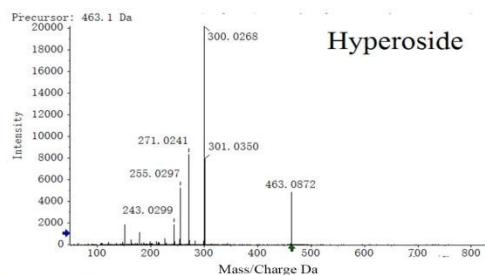


Figure S1. Effects of ethanol concentration, solid-liquid ratio, and extraction time on extraction yields of four constituents. ("extraction yield (%) = weight of analyte (mg) / weight of dried sample (g) × 100%")





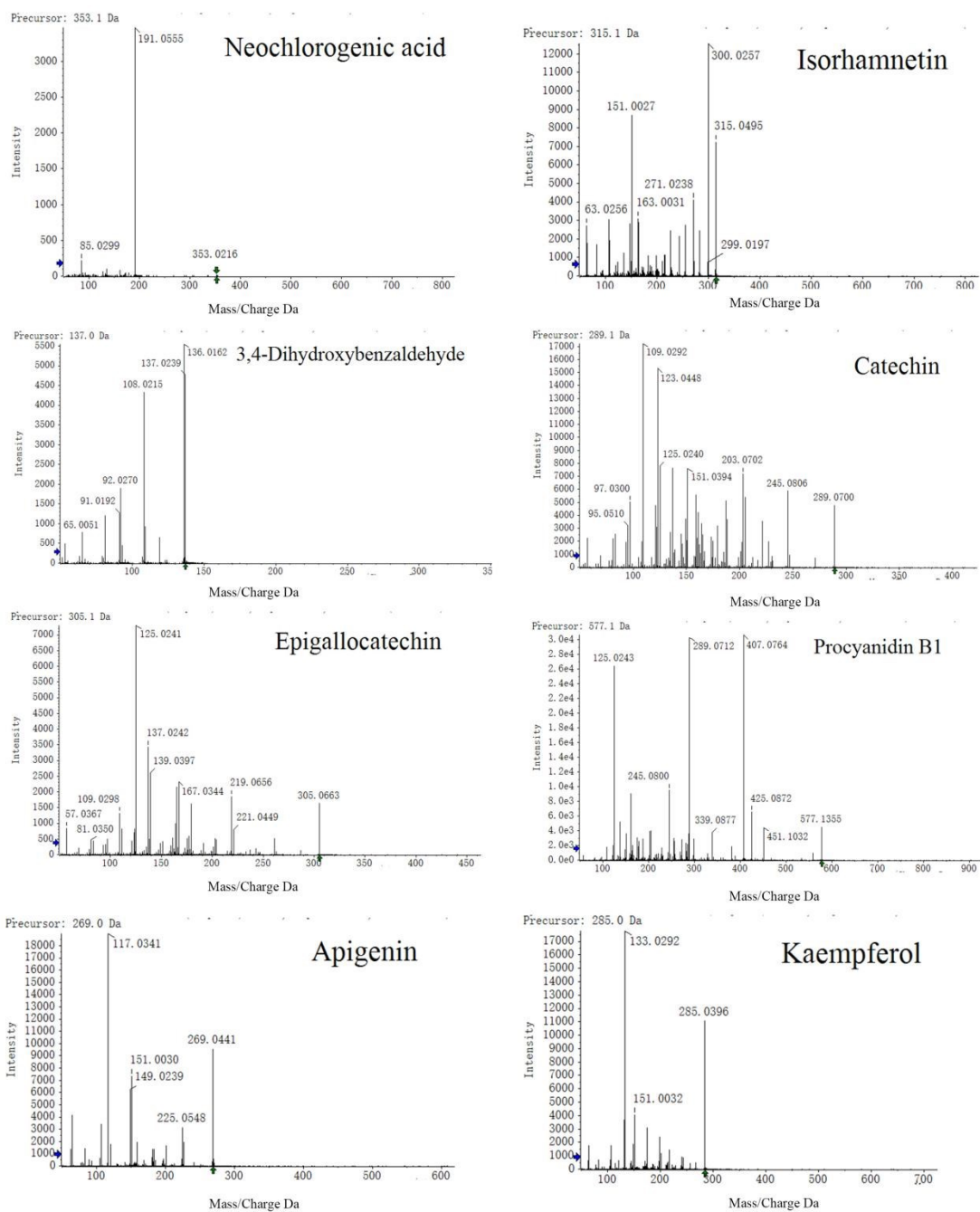
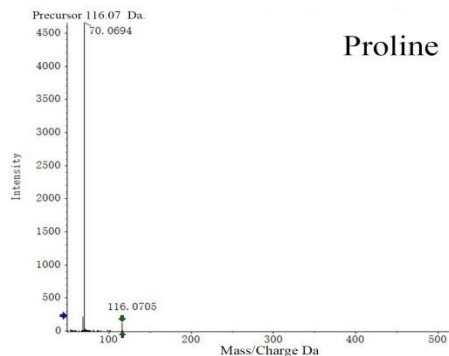
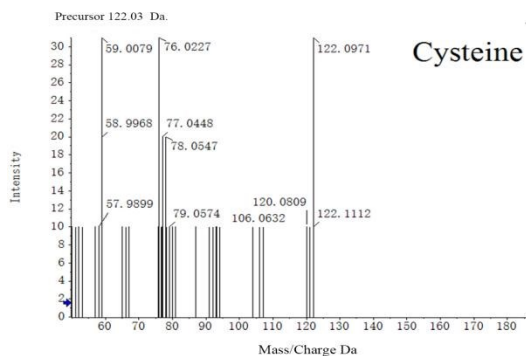
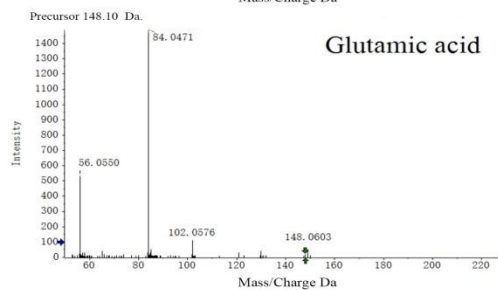
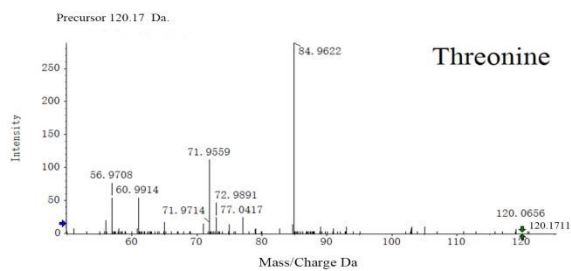
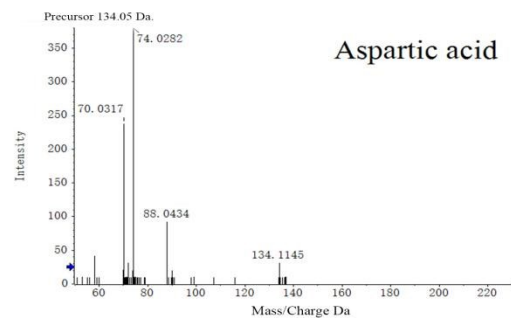
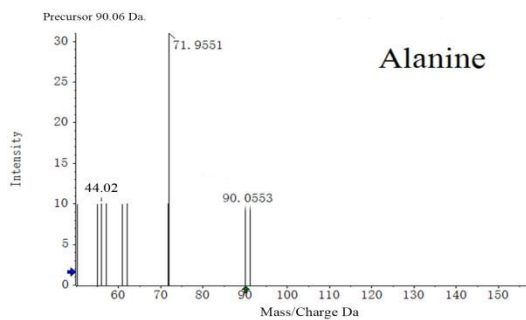
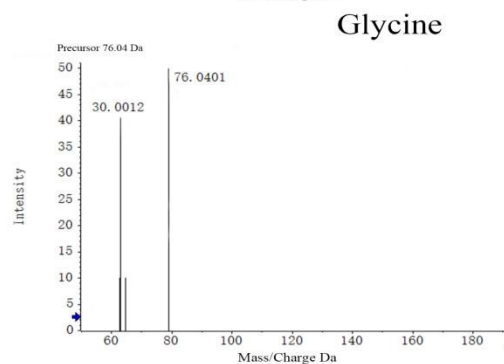
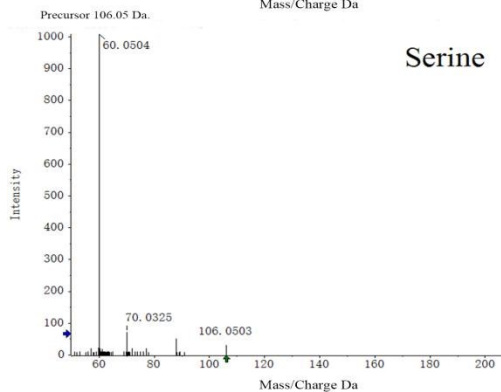
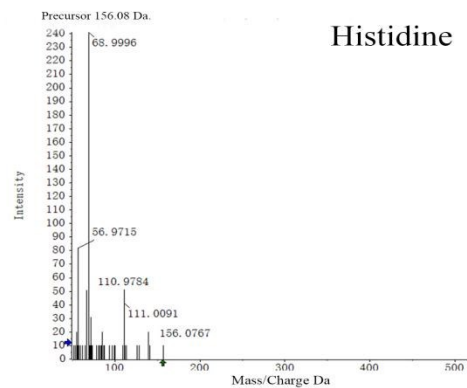
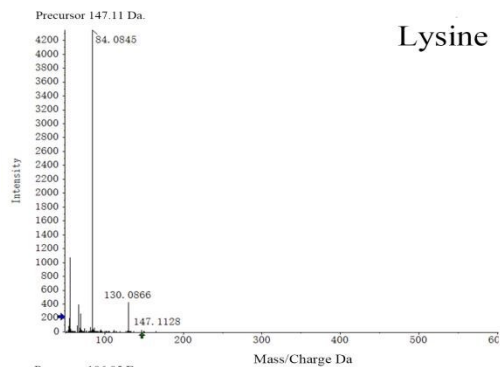
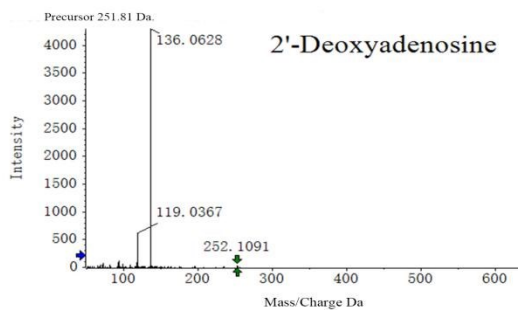
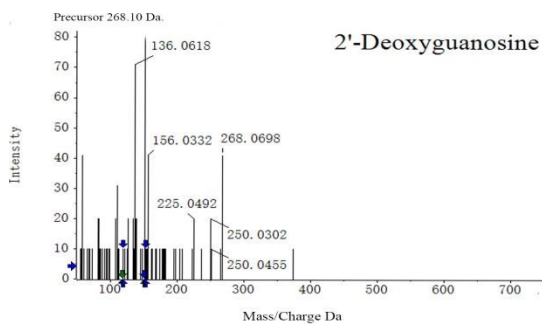
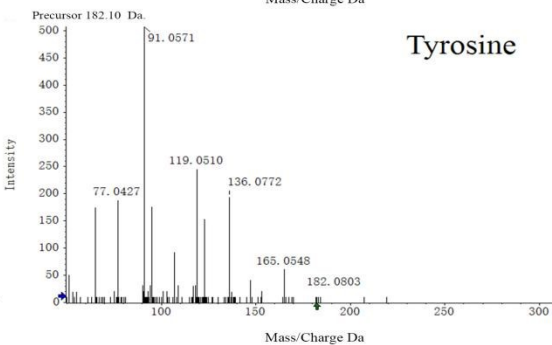
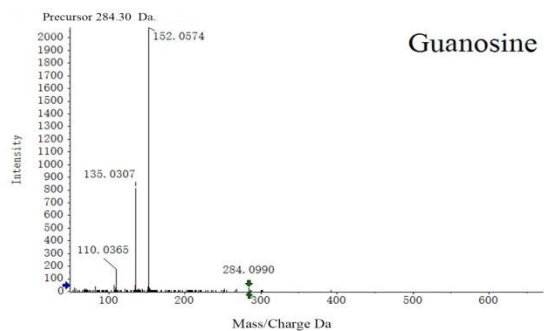
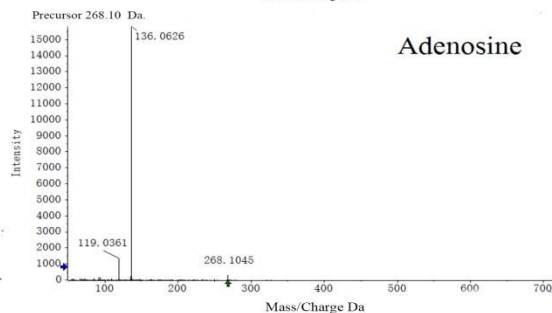
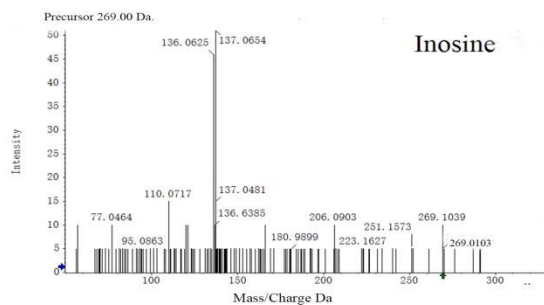
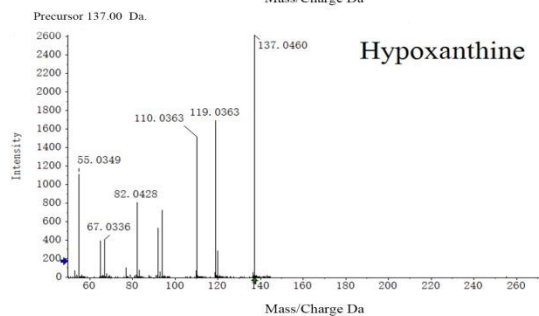
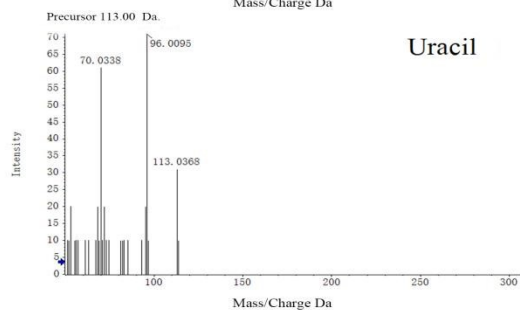
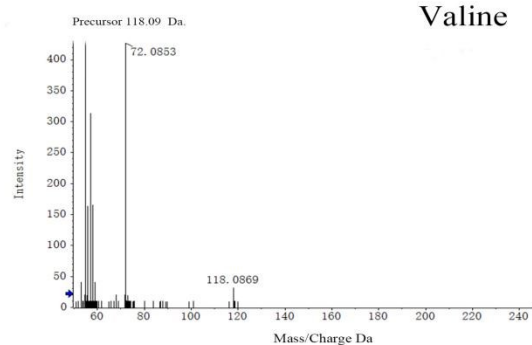
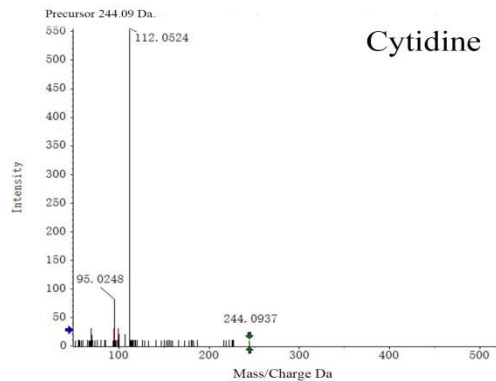


Figure S2. The MS spectra of 32 constituents in negative ion modes.





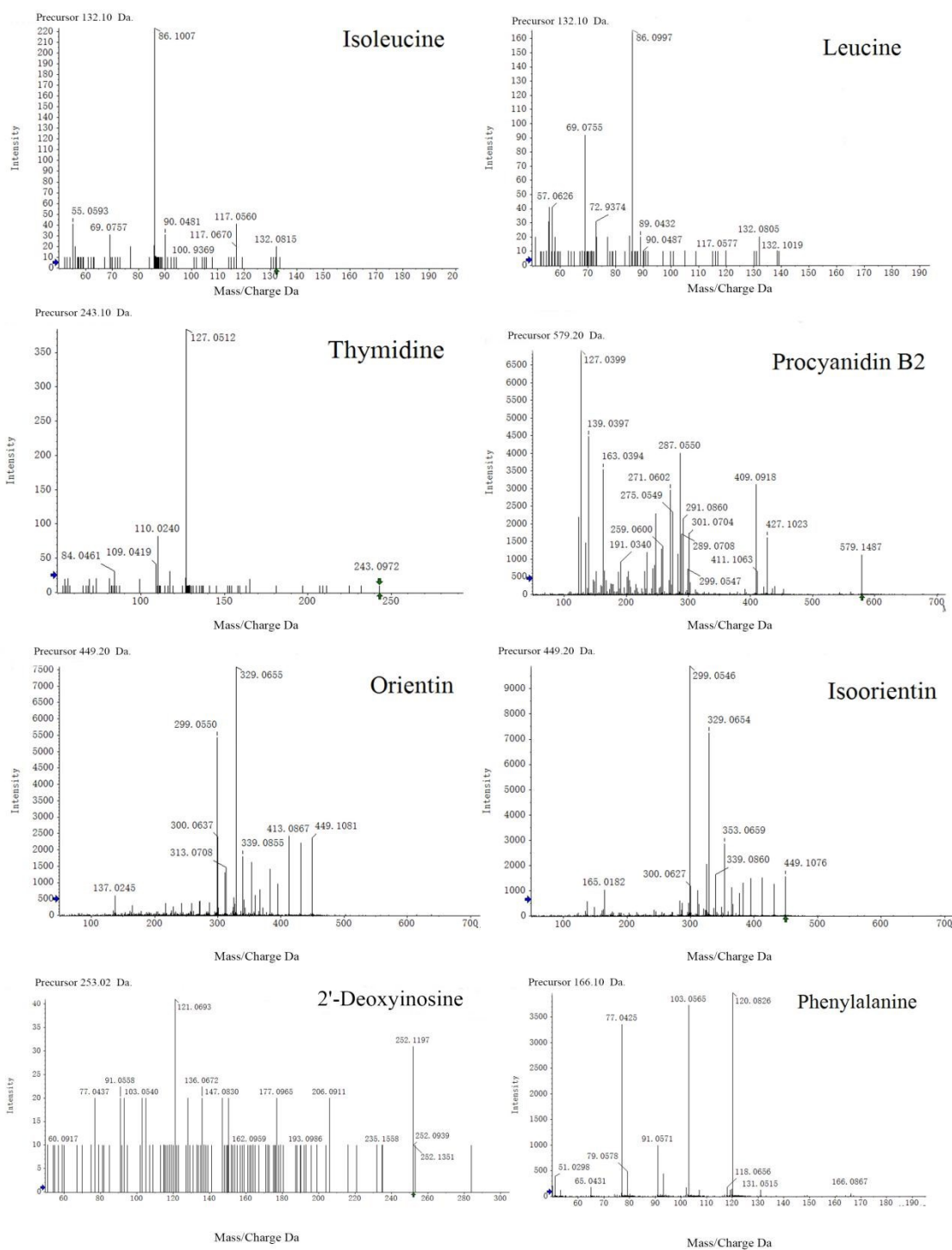


Figure S3. The MS spectra of 28 constituents in positive ion modes.

Supplementary tables

Table S1. Contents of 60 constituents in samples. (μg/g, n = 3)

No.	Constituents	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15
1	Lysine	25.99	166.10	277.56	202.58	224.87	169.08	432.67	41-	217.50	25-	244.17	243.95	249.38	400.24	116.77
2	Histidine	3.85	85.30	83.77	84.50	58.46	45.67	56.27	71.38	28.50	24.08	22.83	38.28	34.50	136.83	61.51
3	Glycine	4.67	19.41	7.35	14.85	15.39	8.43	14.91	13.98	10.30	9.28	9.32	17.01	14.55	2.98	9.20
4	Serine	18.92	33.77	81.52	53.25	66.21	47.88	65.28	65.08	29.75	25.00	26.67	37.03	38.88	53.28	40.51
5	Alanine	277.39	757.95	635.13	696.25	394.76	524.17	550.22	443.33	169.25	143.25	136.00	540.43	585.83	580.35	525.11
6	Aspartic acid	14.64	49.53	44.26	46.88	102.94	95.13	81.03	68.67	28.75	36.00	33.92	48.29	54.38	86.55	37.51
7	Threonine	24.44	31.52	28.51	3-	25.48	25.37	110.29	111.00	13.15	11.15	12.23	42.78	36.79	138.33	96.52
8	Glutamic acid	7.60	47.78	61.51	54.63	107.19	109.25	34.26	35.00	17.85	31.50	28.50	51.29	44.01	17.19	2.31
9	Cysteine	0.19	0.54	0.59	0.56	4.37	4.47	1.95	1.52	2.73	1.84	1.86	0.54	0.49	0.49	1.40
10	Proline	169.18	785.47	730.15	757.50	1226.76	128-	467.69	475.83	262.50	307.50	284.17	763.11	718.33	435.26	199.54
11	Cytidine	3.32	5.50	2.15	3.82	18.26	17.53	7.75	6.64	2.26	7.08	5.25	5.05	5.45	11.11	1.87
12	Uracil	3.42	7.78	7.80	7.79	12.59	14.35	29.26	22.64	10.73	14.43	10.65	6.51	9.15	17.89	7.73
13	Valine	46.98	66.79	63.01	64.88	82.45	119.08	53.27	71.42	66.75	45.75	54.58	68.05	52.88	51.03	99.02
14	Hypoxanthine	35.74	40.77	29.51	35.13	28.98	33.67	47.02	48.08	13.60	8.60	11.03	23.87	32.70	37.27	38.26
15	Uridine	1-	23.64	25.51	24.56	18.84	27.29	24.56	26.99	18.90	11.50	14.05	8.01	9.48	29.77	13.58
16	Adenosine	32.74	153.09	120.52	136.75	39.98	59.00	112.04	96.75	31.25	23.03	27.59	83.57	69.25	18.44	7.38
17	2'-Deoxyadenosine	0.10	0.08	0.10	0.09	0.09	0.09	0.17	0.14	0.08	0.10	0.11	0.10	0.10	0.07	0.07
18	Tyrosine	19.89	18.79	15.15	16.96	84.20	73.75	34.01	27.13	15.05	41.50	32.02	29.02	26.40	36.27	23.28
19	Guanosine	7.17	14.33	5.95	10.14	24.64	23.53	10.93	9.70	4.88	20.73	15.49	16.71	12.94	12.46	4.50
20	Inosine	0.31	0.79	0.57	0.68	1.12	1.12	0.96	0.68	0.42	1.25	0.93	0.59	0.57	0.70	0.34
21	Gallic acid	0.57	0.74	0.55	1.98	2.85	12.69	2.48	2.10	1.77	1.16	3.48	0.55	2.01	0.88	0.45
22	2'-Deoxyguanosine	0.06	0.08	0.07	0.08	0.22	0.19	0.19	0.16	0.05	0.11	0.09	0.11	0.09	0.07	0.06
23	Isoleucine	14.22	20.21	20.90	20.55	26.23	30.83	34.26	32.67	16.95	14.63	14.78	30.02	27.03	36.52	24.33

24	2'-Deoxyinosine	0.12	0.17	0.12	0.14	0.14	0.14	0.23	0.16	0.28	0.18	0.20	0.13	0.12	0.14	0.13
25	Leucine	19.37	42.03	44.01	43.00	63.96	73.00	83.78	71.58	35.50	28.00	30.67	63.55	59.58	83.30	70.76
26	Thymidine	0.56	0.56	0.53	0.54	0.93	1.01	0.91	0.98	0.58	0.71	0.66	1.06	0.89	0.46	0.55
27	Phenylalanine	194.92	232.64	244.30	238.38	225.61	250.67	237.34	254.33	218.75	216.75	219.92	335.27	288.17	244.65	239.55
28	Protocatechuic acid	2.92	1.75	2.21	0.65	10.89	3.08	1.77	1.58	3.98	3.75	1.41	1.65	0.62	1.29	0.94
29	Neochlorogenic acid	0.90	0.77	0.57	0.67	1.19	0.97	1.12	1.24	0.36	0.64	0.47	1.42	1.44	0.22	0.04
30	Procyanidin B2	979.61	705.42	482.60	593.75	704.58	831.67	36.51	79.83	119-	1277.50	1127.50	930.74	970.83	272.66	470.09
31	3,4-Dihydroxybenzaldehyde	0.70	0.63	0.90	0.76	1.65	1.77	1.90	1.82	1.92	1.28	1.45	0.43	0.66	0.18	0.15
32	Epigallocatechin	3.20	2.53	3.48	3.00	0.27	0.27	0.08	0.10	2.43	0.09	0.11	2.02	2.26	0.51	0.38
33	Catechin	157.94	162.35	243.55	202.88	432.24	396.67	18.58	20.56	252.50	262.50	249.83	267.71	233.08	93.56	91.52
34	Procyanidin B1	1.05	0.80	0.65	0.72	0.91	0.90	0.43	0.43	1.26	1.07	1.09	1.00	0.73	0.55	0.48
35	Chlorogenic acid	0.08	0.05	0.09	0.07	0.26	0.16	0.12	0.12	0.14	0.11	0.12	0.06	0.08	0.13	0.24
36	Cryptochlorogenic acid	0.19	0.70	0.37	0.54	1.06	1.36	2.98	2.88	0.08	0.06	0.23	0.05	0.06	0.79	2.35
37	Caffeic acid	1.17	1.52	1.02	1.27	2.55	2.56	1.05	1.12	1.34	1.24	1.23	0.75	0.79	1.56	0.81
38	Epicatechin	8.90	12.86	5.48	9.16	9.67	9.53	2.93	3.42	11.70	7.75	8.89	7.51	6.59	2.93	2.63
39	Polydatin	7.90	2.60	2.93	2.76	11.72	10.08	1.77	1.67	3.15	2.05	2.42	2.88	2.43	17.04	6.58
40	Orientin	-	-	-	-	0.02	0.01	0.02	0.01	0.02	-	-	0.02	0.02	0.61	0.50
41	Isoorientin	-	-	-	-	-	-	-	-	-	-	-	-	-	0.05	-
42	Piceatannol	5.75	100.81	119.27	11-	16.44	21.70	1.40	1.73	6.38	0.55	2.50	4.75	4.49	4.50	2.21
43	Vitexin	0.01	0.05	0.06	0.05	0.09	0.07	0.09	0.05	0.12	0.10	0.09	0.03	0.03	1.89	1.40
44	Vitexin-2''-O-rhamnoside	0.07	0.07	0.06	0.07	0.07	0.08	0.06	0.06	0.17	0.09	0.11	0.09	0.08	0.07	0.05
45	Isovitexin	-	-	-	-	0.02	0.01	-	-	0.03	0.06	0.04	-	-	2.42	2.60
46	Hyperoside	-	-	-	-	-	-	-	-	0.19	0.14	0.15	-	-	-	-
47	Aromadendrin	0.20	0.26	0.25	0.25	0.55	0.53	0.24	0.25	0.21	0.20	0.19	0.23	0.18	0.13	0.16
48	Rutin	-	-	-	-	1.68	1.51	9.70	13.26	0.45	0.80	0.73	0.77	0.35	-	-
49	Isoquercitrin	-	-	-	-	-	-	1.91	1.47	1.79	1.46	1.77	-	-	-	-
50	Resveratrol	0.61	12.58	9.80	11.19	1.70	3.77	0.21	0.12	6.15	0.11	2.13	0.35	0.54	1.27	1.27

51	Quercitrin	0.18	0.17	0.17	0.17	0.29	0.26	0.19	0.20	0.51	0.35	0.44	0.17	0.18	0.16	0.13
52	Astragalin	0.04	0.04	0.05	0.04	0.17	0.15	2.49	1.94	0.53	0.57	0.51	0.05	0.04	2.53	1.13
53	Nicotiflorin	0.09	0.16	0.14	0.15	1.29	0.86	27.26	30.75	0.23	0.24	0.23	0.39	0.35	0.17	0.09
54	Narcissin	0.51	0.54	0.51	0.52	0.08	0.09	0.07	0.07	0.11	0.11	0.11	0.56	0.55	0.61	0.58
55	Afzelin	-	-	-	-	0.01	0.02	0.05	0.03	0.04	0.13	0.09	-	-	-	-
56	Quercetin	0.28	0.19	0.16	0.18	0.37	0.43	0.38	0.44	0.36	0.29	0.29	0.14	0.13	0.53	0.41
57	Luteolin	0.19	0.14	0.14	0.14	0.21	0.21	0.19	0.20	0.19	0.16	0.18	0.14	0.14	0.15	0.14
58	Kaempferol	0.31	0.34	0.30	0.32	0.33	0.34	0.36	0.42	0.43	0.32	0.36	0.31	0.30	1.04	0.61
59	Apigenin	0.08	0.03	0.04	0.04	0.05	0.06	0.05	0.06	0.07	0.04	0.06	0.01	0.01	0.01	0.02
60	Isorhamnetin	0.11	0.07	0.06	0.06	0.08	0.09	0.07	0.07	0.11	0.11	0.11	0.06	0.05	0.14	0.13

Note: “-” not detected

Table S1. Contents of 60 constituents in samples. (continued)

No.	Constituents	S16	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30
1	Lysine	275.17	87.25	263.75	94.17	329.33	394.92	391.25	529.58	138.13	78.33	129.83	68.76	80.35	59.75	80.33
2	Histidine	36.27	18.60	38.13	31.13	53.67	68.74	65.38	54.21	37.88	18.24	40.77	12.65	14.74	16.48	15.79
3	Glycine	16.63	13.50	15.15	11.04	6.56	4.97	6.56	9.94	5.39	14.24	8.05	3.38	8.09	9.58	10.45
4	Serine	60.04	64.00	62.50	55.17	63.25	91.23	76.38	89.43	39.75	40.29	33.52	36.01	42.51	49.25	42.50
5	Alanine	550.33	272.50	513.75	250.83	552.52	637.37	552.50	639.49	488.33	432.93	457.77	285.06	233.20	159.50	233.17
6	Aspartic acid	54.28	16.28	53.13	23.81	55.95	76.23	74.25	70.94	33.25	24.47	30.27	31.26	36.59	35.75	36.58
7	Threonine	92.81	27.75	79.63	37.00	41.09	29.74	41.08	67.20	21.70	28.53	21.44	20.58	24.36	25.50	26.25
8	Glutamic acid	13.56	11.63	12.11	9.61	31.01	38.74	41.38	46.96	21.53	13.59	14.28	11.70	20.31	36.50	24.61
9	Cysteine	0.84	6.73	1.50	3.68	0.66	0.63	0.62	0.44	2.32	2.35	3.20	2.03	1.43	1.52	1.43
10	Proline	362.72	31-	323.75	335.83	606.69	647.37	673.75	289.77	370.25	160.91	405.24	520.10	529.24	515.00	529.17
11	Cytidine	4.20	3.58	3.95	4.61	6.28	7.82	7.71	11.69	3.57	1.98	4.28	1.11	2.40	2.17	2.40
12	Uracil	10.76	68.50	8.75	42.00	9.31	11.05	11.80	9.92	15.14	20.27	15.01	15.25	18.83	31.25	18.83

13	Valine	113.07	56.50	111.75	55.50	76.09	75.73	83.25	61.70	79.17	89.34	59.79	83.77	89.26	75.55	89.25
14	Hypoxanthine	8.20	43.00	7.94	54.83	12.70	12.27	10.51	11.99	31.46	21.15	32.52	17.65	19.12	20.60	19.12
15	Uridine	9.36	26.25	10.54	17.50	12.41	15.92	13.60	33.22	15.03	19.27	15.43	20.35	17.61	16.15	17.61
16	Adenosine	13.76	92.25	12.63	61.33	82.25	97.23	107.63	48.71	109.33	92.40	107.81	39.51	46.84	49.50	46.83
17	2'-Deoxyadenosine	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.12	0.11	0.08	0.13	0.15	0.13	0.15
18	Tyrosine	27.27	17.08	30.38	26.36	29.67	36.49	38.25	110.66	48.37	23.37	61.54	5.03	14.71	20.30	14.71
19	Guanosine	17.21	6.63	15.15	6.45	18.47	22.77	22.13	21.26	6.99	3.65	8.36	4.33	7.28	9.40	7.28
20	Inosine	0.89	3.58	0.94	3.83	0.66	0.73	0.78	0.59	0.89	0.68	0.96	0.56	0.90	0.99	0.90
21	Gallic acid	0.35	0.41	1.83	8.21	0.78	1.34	1.79	0.46	2.51	0.55	0.94	1.30	1.76	2.78	5.98
22	2'-Deoxyguanosine	0.12	0.09	0.12	0.19	0.26	0.36	0.33	0.08	0.13	0.06	0.13	0.15	0.35	0.41	0.35
23	Isoleucine	25.77	22.03	24.41	21.10	29.79	35.49	33.88	53.21	23.42	24.37	22.51	16.30	18.74	19.65	18.73
24	2'-Deoxyinosine	0.16	0.20	0.14	0.18	0.16	0.18	0.18	0.15	0.15	0.13	0.16	0.25	0.25	0.22	0.25
25	Leucine	58.03	54.25	51.88	47.08	70.59	75.73	74.50	109.16	54.58	50.30	47.28	36.26	42.59	45.50	42.58
26	Thymidine	0.72	0.91	0.74	0.81	0.87	1.16	1.05	0.99	0.90	0.75	1.03	0.82	0.81	0.82	0.81
27	Phenylalanine	242.15	345.00	243.63	334.17	192.01	187.96	218.00	244.55	289.17	315.32	295.18	119.77	133.85	127.25	133.83
28	Protocatechuic acid	2.22	10.43	0.44	0.79	1.65	1.58	0.87	1.57	1.09	2.14	2.43	6.10	6.02	4.75	1.76
29	Neochlorogenic acid	0.44	0.82	0.39	0.76	0.50	0.50	0.52	0.04	1.02	0.70	0.71	0.18	0.25	0.36	0.25
30	Procyanidin B2	502.80	1272.50	448.75	866.67	551.24	567.39	732.50	233.06	131.50	159.91	126.83	91.27	112.10	110.75	112.08
31	3,4-Dihydroxybenzaldehyde	0.47	2.65	0.48	2.87	0.25	0.22	0.27	0.07	0.55	0.59	0.58	2.12	1.70	1.54	1.70
32	Epigallocatechin	0.30	0.05	0.34	0.07	0.69	0.71	0.82	0.05	0.26	0.38	0.28	0.08	0.09	0.06	0.09
33	Catechin	88.05	128.00	84.75	129.92	132.25	152.97	165.00	99.17	61.33	46.30	72.04	30.51	31.85	49.00	31.85
34	Procyanidin B1	0.50	0.80	0.54	0.73	0.57	0.63	0.61	0.44	0.43	0.44	0.45	0.45	0.46	0.43	0.46
35	Chlorogenic acid	0.11	0.24	0.12	0.18	0.10	0.11	0.11	0.15	0.12	0.09	0.15	0.11	0.15	0.19	0.15
36	Cryptochlorogenic acid	1.94	1.00	1.79	0.91	0.09	0.10	0.09	0.08	2.76	0.86	2.58	0.05	0.29	0.34	0.29
37	Caffeic acid	1.64	1.45	1.18	1.28	1.34	1.48	1.41	1.03	1.50	2.53	1.15	0.65	0.73	0.62	0.73
38	Epicatechin	2.63	5.68	2.71	5.38	3.11	3.77	3.58	2.28	3.68	2.88	3.58	3.23	3.17	2.36	3.17
39	Polydatin	8.58	6.85	8.55	5.27	9.00	10.27	10.81	2.82	2.62	2.65	1.78	1.13	1.24	1.42	1.24

40	Orientin	0.05	-	0.07	-	0.03	-	0.04	-	0.01	0.02	0.01	0.01	0.04	0.09	0.04
41	Isoorientin	0.14	-	0.14	-	0.11	0.13	0.11	-	-	-	-	0.01	-	-	-
42	Piceatannol	8.23	98.50	7.64	91.42	31.07	30.99	36.88	0.50	3.94	4.18	3.38	2.35	1.50	0.78	1.50
43	Vitexin	3.40	0.03	3.95	0.04	2.21	2.06	2.55	0.88	0.09	0.11	0.08	0.08	0.13	0.23	0.13
44	Vitexin-2"-O-rhamnoside	0.06	0.06	0.06	0.08	0.06	0.05	0.06	0.07	0.07	0.06	0.09	0.07	0.07	0.08	0.07
45	Isovitexin	4.00	-	4.25	-	1.83	1.73	1.64	1.14	0.04	-	0.09	0.22	0.17	0.11	0.17
46	Hyperoside	-	0.08	-	0.03	-	-	-	-	-	-	-	0.14	0.22	0.25	0.13
47	Aromadendrin	0.13	1.23	0.13	1.15	0.21	0.28	0.23	0.14	0.14	0.15	0.16	0.32	0.30	0.24	0.30
48	Rutin	0.98	315.00	1.14	274.67	0.14	0.20	0.11	0.45	37.75	29.78	37.77	27.51	31.17	28.50	31.17
49	Isoquercitrin	8.13	74.50	6.89	74.50	1.62	2.27	2.42	-	-	-	-	5.93	6.30	4.45	6.30
50	Resveratrol	0.72	7.68	0.50	4.29	0.41	0.62	0.51	0.42	0.52	0.84	0.19	0.92	0.35	0.11	0.35
51	Quercitrin	0.29	0.26	0.27	0.25	0.18	0.18	0.18	0.20	0.32	0.30	0.32	0.34	0.53	0.82	0.53
52	Astragalin	26.27	56.50	23.15	64.83	10.28	11.50	12.25	1.31	0.40	0.20	0.61	2.45	2.60	2.39	2.60
53	Nicotiflorin	1.45	482.50	1.22	421.67	0.33	0.40	0.43	0.65	25.64	18.69	29.02	35.01	48.84	48.75	48.83
54	Narcissin	0.60	0.17	0.61	0.15	0.53	0.51	0.52	0.56	0.09	0.10	0.09	0.09	0.08	0.07	0.08
55	Afzelin	-	-	-	0.01	-	-	-	-	0.01	0.01	0.02	0.13	0.10	0.06	0.10
56	Quercetin	1.23	10.53	1.11	7.40	0.61	0.53	0.60	0.13	0.40	0.41	0.40	0.70	0.40	0.19	0.40
57	Luteolin	0.15	0.30	0.14	0.28	0.14	0.14	0.14	0.15	0.17	0.16	0.17	0.22	0.20	0.17	0.20
58	Kaempferol	2.17	6.38	1.82	4.64	0.84	0.96	0.89	0.39	0.41	0.44	0.38	0.49	0.45	0.40	0.45
59	Apigenin	0.04	0.10	0.04	0.10	0.02	0.01	0.01	0.02	0.06	0.06	0.06	0.07	0.07	0.08	0.07
60	Isorhamnetin	0.22	0.17	0.19	0.15	0.14	0.16	0.16	0.06	0.09	0.10	0.09	0.09	0.08	0.07	0.08

Note: "-" not detected.

Table S1. Contents of 60 constituents in samples. (continued)

No.	Constituents	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40	S41	S42	S43	S44	S45	S46	S47
1	Lysine	14.52	63.72	90.73	144.47	171.25	5.17	12.22	13.20	15.24	13.21	14.23	228.57	205.50	49.96	77.95	44.29	54.00
2	Histidine	6.95	7.80	8.20	12.60	15.65	3.45	28.24	19.38	5.67	9.68	7.68	19.73	19.81	12.47	12.02	7.81	9.71
3	Glycine	4.87	2.43	9.07	7.57	8.63	1.52	2.24	2.56	2.87	3.88	3.38	5.37	5.87	4.30	3.47	3.05	2.64
4	Serine	19.52	15.34	49.49	56.74	57.75	2.72	8.80	10.01	8.52	3.60	6.06	34.47	37.42	17.31	28.73	14.41	18.64
5	Alanine	377.35	201.92	112.73	106.98	119.17	96.96	63.22	96.75	62.71	67.79	65.25	103.92	117.08	272.28	117.93	83.57	103.13
6	Aspartic acid	17.94	5.32	18.00	29.99	31.88	11.30	15.59	16.45	41.23	38.52	39.88	42.97	45.88	73.94	16.27	13.01	15.28
7	Threonine	23.32	8.55	13.60	12.32	14.17	4.05	8.35	11.29	19.89	18.66	19.28	13.54	13.86	32.97	18.76	17.09	20.16
8	Glutamic acid	2.10	3.15	7.02	10.67	12.26	3.00	7.92	10.51	31.73	32.27	32.00	24.16	24.40	66.20	19.51	19.42	24.45
9	Cysteine	0.69	9.00	3.47	1.89	2.30	0.65	0.94	0.97	1.46	4.70	3.08	1.23	1.59	3.40	1.07	0.50	1.87
10	Proline	80.47	86.72	454.91	469.91	528.33	175.43	140.19	290.13	674.60	615.37	645.00	484.61	531.25	189.35	689.59	562.95	688.33
11	Cytidine	1.79	0.64	1.84	3.65	3.88	1.96	3.70	4.69	5.32	3.63	4.48	2.14	1.93	1.40	1.56	1.18	1.43
12	Uracil	3.95	13.27	12.10	13.20	14.28	5.97	5.10	13.68	10.12	5.15	7.64	8.94	7.93	1.27	5.70	4.68	6.12
13	Valine	48.73	19.99	87.48	65.74	89.17	19.17	18.34	17.90	19.54	14.53	17.04	38.97	46.50	7-	28.48	23.94	44.98
14	Hypoxanthine	8.17	19.67	21.10	28.74	39.20	11.70	14.07	18.34	30.48	22.56	26.53	51.71	60.50	17.39	6.77	7.21	10.43
15	Uridine	13.17	3.50	29.74	11.22	20.68	4.50	14.62	19.66	21.74	16.91	19.33	7.94	8.71	8.47	7.27	5.63	10.05
16	Adenosine	30.24	8.57	48.74	42.24	55.00	18.42	37.98	69.13	27.73	34.02	30.88	47.21	52.25	24.41	27.98	13.84	22.98
17	2'-Deoxyadenosine	0.09	0.08	0.09	0.10	0.12	0.07	0.14	0.18	0.19	0.18	0.18	0.16	0.18	0.08	0.11	0.11	0.13
18	Tyrosine	2.87	2.70	8.72	20.35	22.86	2.46	11.97	14.95	14.14	11.18	12.66	22.91	24.09	17.76	42.97	30.77	40.42
19	Guanosine	7.70	1.17	6.45	9.05	10.08	2.75	1.36	4.07	1.74	2.18	1.96	10.52	11.59	4.15	5.87	5.18	6.01
20	Inosine	0.39	0.34	0.58	0.63	0.74	0.36	1.21	1.64	0.48	0.29	0.39	1.31	1.43	0.58	1.34	1.36	1.48
21	Gallic acid	0.43	0.77	0.44	0.48	4.06	0.38	0.41	10.51	3.27	3.20	16.09	1.54	4.89	3.42	2.37	0.75	8.73
22	2'-Deoxyguanosine	0.06	0.07	0.07	0.15	0.15	0.05	0.07	0.08	0.14	0.17	0.15	0.14	0.15	0.05	0.11	0.12	0.12
23	Isoleucine	8.80	5.70	19.92	16.95	21.38	2.70	4.15	6.49	8.39	7.40	7.90	12.42	13.01	17.64	13.17	9.38	14.99
24	2'-Deoxyinosine	0.11	0.13	0.25	0.25	0.25	0.11	0.12	0.15	0.17	0.17	0.17	0.17	0.16	0.13	0.21	0.17	0.18
25	Leucine	21.87	13.42	39.24	31.74	42.17	5.72	9.10	10.75	17.46	13.91	15.69	21.51	23.76	28.98	17.61	13.51	22.00

26	Thymidine	0.47	0.49	0.69	0.58	0.71	0.76	0.70	0.87	1.32	0.97	1.14	0.69	0.71	0.62	0.67	0.59	0.66
27	Phenylalanine	72.72	47.23	200.96	186.71	234.25	25.74	61.73	60.50	27.48	28.77	28.13	157.87	172.13	205.34	116.93	77.06	121.00
28	Protocatechuic acid	4.60	1.80	3.97	3.22	0.90	10.17	9.90	0.49	18.26	13.91	3.24	4.45	1.52	5.70	15.19	6.13	3.47
29	Neochlorogenic acid	0.32	1.56	0.41	0.31	0.27	0.03	0.03	0.03	0.11	0.01	0.06	0.26	0.32	0.03	0.46	0.39	0.78
30	Procyanidin B2	79.97	14.92	279.94	193.96	243.00	70.72	73.22	64.50	32.48	15.03	23.76	359.71	365.00	162.12	196.63	310.25	503.33
31	3,4-Dihydroxybenzaldehyde	1.64	1.04	2.38	2.41	2.66	1.43	0.78	1.02	1.50	0.59	1.05	2.50	2.85	1.54	4.55	4.18	6.03
32	Epigallocatechin	0.06	0.06	0.08	0.11	0.08	0.05	0.07	0.10	0.06	0.08	0.07	0.06	0.08	0.06	0.06	0.07	0.11
33	Catechin	10.12	6.57	31.24	50.24	52.83	12.07	7.87	17.19	5.15	4.83	4.99	83.68	78.00	44.46	107.44	82.82	117.33
34	Procyanidin B1	0.38	0.36	0.52	0.47	0.52	0.39	0.39	0.40	0.35	0.34	0.34	0.55	0.55	0.46	0.51	0.59	0.97
35	Chlorogenic acid	0.07	0.12	0.12	0.16	0.14	0.09	0.07	0.07	0.07	0.05	0.06	0.12	0.14	0.06	0.24	0.19	0.17
36	Cryptochlorogenic acid	0.24	0.91	0.38	0.98	0.65	0.25	0.28	0.33	0.34	0.20	0.27	0.48	0.47	0.05	0.54	0.37	0.40
37	Caffeic acid	1.24	1.15	0.69	0.85	0.85	0.76	1.09	0.93	1.34	1.13	1.24	0.76	0.80	1.79	0.81	0.47	0.60
38	Epicatechin	1.47	2.15	3.25	3.05	3.31	1.31	1.26	1.73	1.13	0.93	1.03	4.25	4.20	1.53	7.27	5.60	8.89
39	Polydatin	0.97	0.57	4.52	2.50	4.01	1.25	0.74	0.96	0.81	0.90	0.86	3.42	2.98	1.54	3.65	3.98	8.59
40	Orientin	-	-	0.05	0.05	0.03	-	-	-	-	-	-	-	-	-	0.04	0.01	0.04
41	Isoorientin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	-	-
42	Piceatannol	9.40	0.95	7.85	3.75	6.63	6.40	3.57	5.54	2.92	0.76	1.84	0.59	0.73	57.70	4.80	10.06	29.87
43	Vitexin	-	0.06	0.04	0.04	0.04	0.03	0.01	0.01	0.04	0.01	0.03	0.05	0.06	0.02	0.08	0.04	0.05
44	Vitexin-2''-O-rhamnoside	0.06	0.06	0.07	0.07	0.07	0.05	0.07	0.07	0.06	0.10	0.08	0.08	0.08	0.06	0.09	0.07	0.07
45	Isovitexin	-	-	0.01	0.02	0.02	-	-	-	-	-	-	0.02	0.03	-	0.02	0.05	0.06
46	Hyperoside	-	-	0.23	0.30	0.32	-	-	-	-	-	-	0.30	0.26	-	0.23	0.19	0.26
47	Aromadendrin	0.56	0.24	0.54	0.38	0.51	0.12	0.15	0.21	0.10	0.08	0.09	0.23	0.23	0.43	0.24	0.31	0.55
48	Rutin	80.97	18.09	90.48	71.99	96.83	99.96	79.47	109.00	0.31	0.46	0.39	122.65	125.38	36.72	0.86	0.56	0.70
49	Isoquercitrin	14.99	-	34.74	21.67	32.06	48.98	25.74	42.88	-	-	-	11.39	10.83	15.44	16.32	17.61	28.37
50	Resveratrol	0.99	0.15	6.67	0.40	3.23	1.78	0.34	0.34	0.23	0.37	0.30	0.25	0.29	18.51	0.10	0.58	6.83
51	Quercitrin	0.22	0.20	0.75	0.52	0.72	0.20	0.17	0.17	0.18	0.16	0.17	1.17	1.16	0.14	0.30	0.28	0.37
52	Astragalin	11.40	1.11	22.32	14.60	20.89	28.99	15.24	17.44	1.71	1.58	1.65	9.69	9.48	13.04	4.02	6.56	9.83

53	Nicotiflorin	106.96	22.12	100.98	70.24	98.58	121.45	71.97	100.38	0.71	0.32	0.51	53.71	57.42	63.20	0.30	0.25	0.26
54	Narcissin	1.91	0.06	0.10	0.13	0.11	3.07	2.16	2.61	0.58	0.55	0.57	0.11	0.11	1.03	0.10	0.10	0.10
55	Afzelin	-	0.02	0.07	0.02	0.07	-	-	-	-	-	-	0.04	0.04	-	0.04	0.05	0.09
56	Quercetin	5.77	0.53	2.26	0.64	1.21	6.25	1.83	2.87	0.21	0.21	0.21	0.32	0.29	4.50	0.25	0.26	0.83
57	Luteolin	0.23	0.18	0.23	0.21	0.21	0.17	0.16	0.17	0.17	0.18	0.17	0.18	0.19	0.20	0.19	0.21	0.22
58	Kaempferol	1.36	0.39	1.17	0.65	0.81	1.66	0.63	0.83	0.39	0.32	0.36	0.35	0.38	1.79	0.34	0.38	0.49
59	Apigenin	0.06	0.03	0.11	0.12	0.11	0.07	0.03	0.04	0.01	0.04	0.03	0.08	0.08	0.05	0.07	0.09	0.10
60	Isorhamnetin	0.08	0.06	0.10	0.13	0.11	0.21	0.13	0.15	0.07	0.08	0.07	0.11	0.13	0.10	0.10	0.10	0.10

Note: “-” not detected.