Electronic Supplementary Material (ESI) for Molecular Omics.
This journal is © The Royal Society of Chemistry 2023

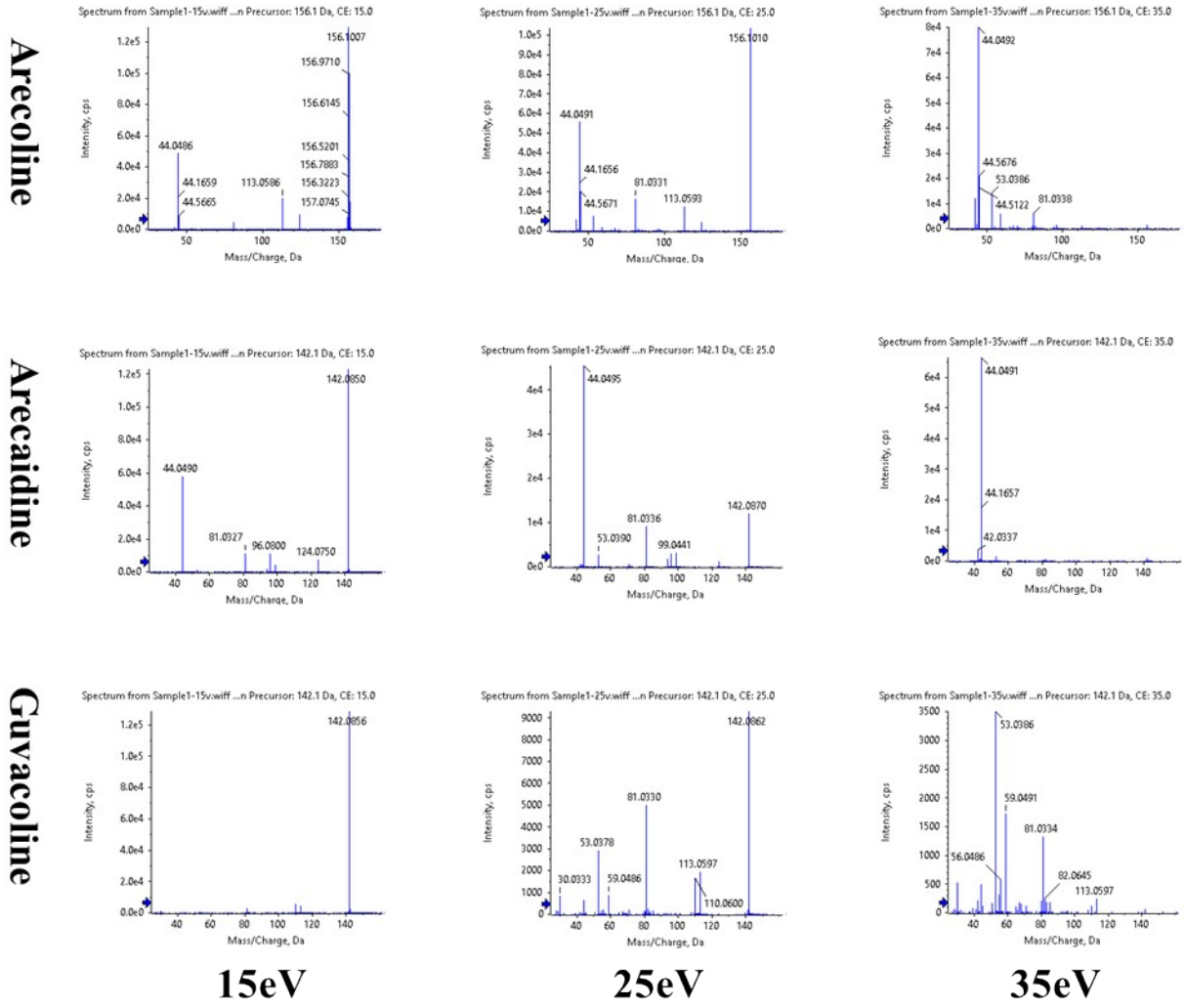

Figure S1. Optimization of Positive Ion Mode in Mass Spectrometry

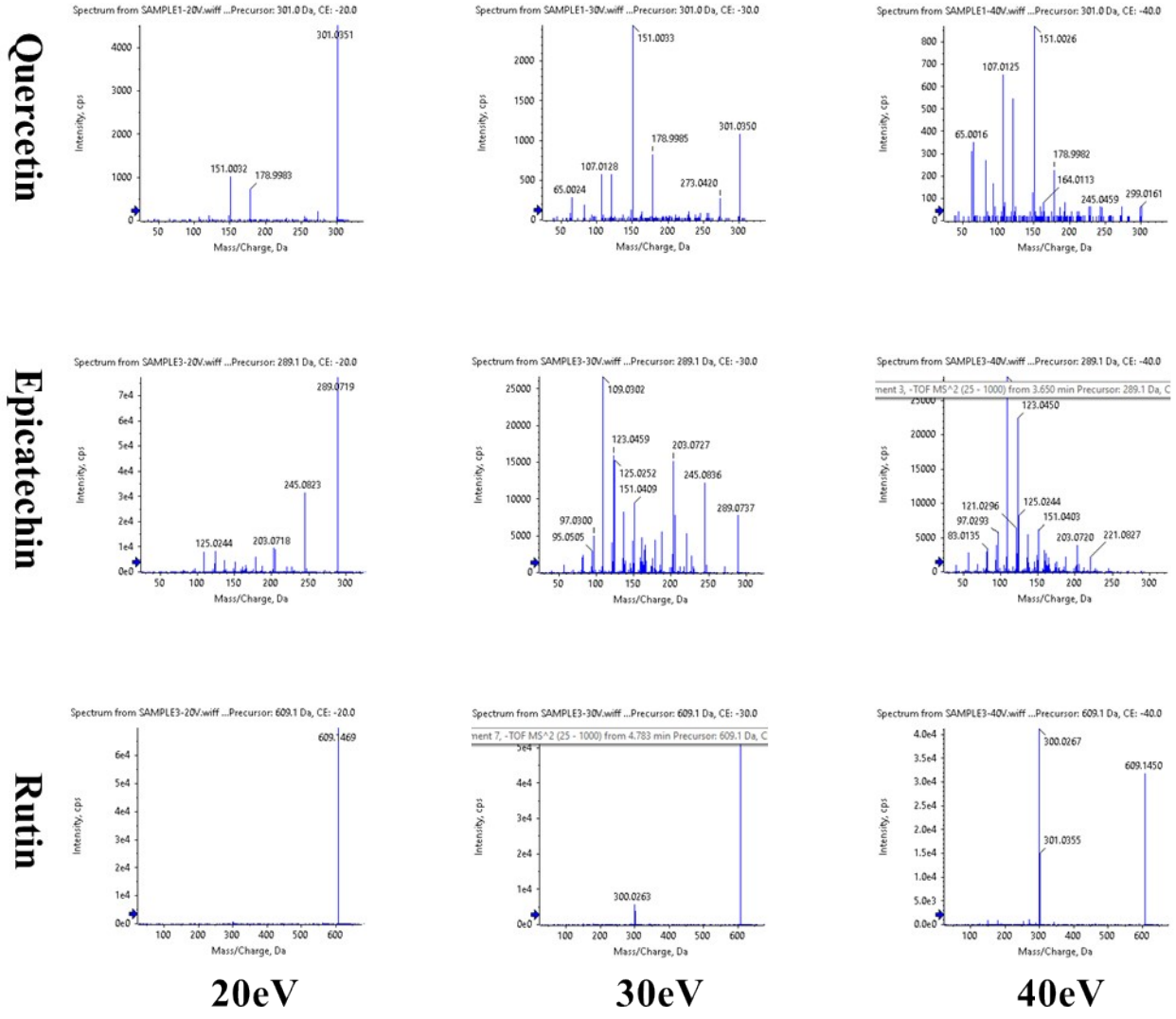

Figure S2. Optimization of negative ion modes in mass spectrometry

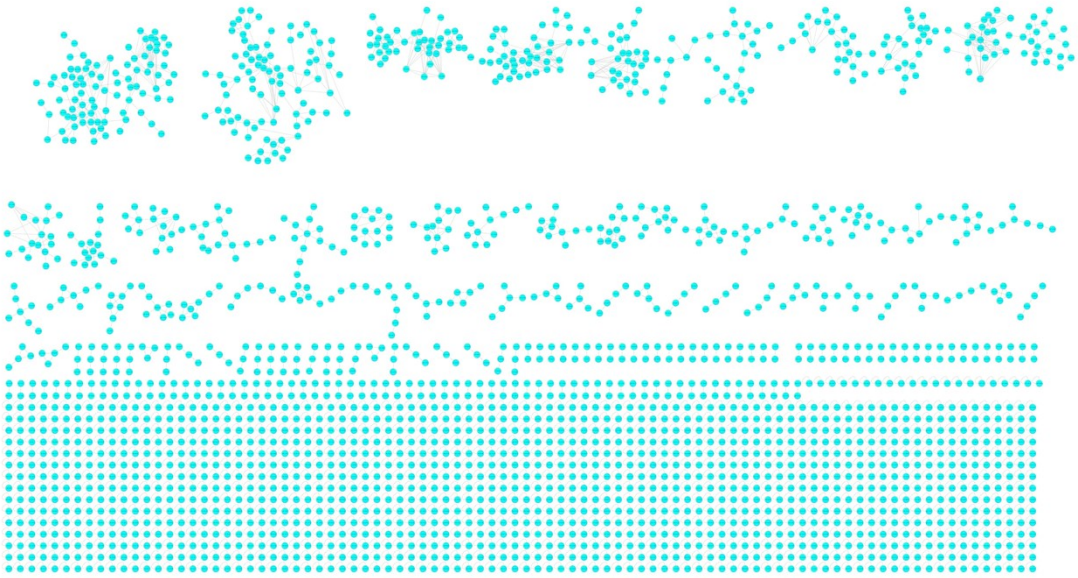

Figure S3. Molecular network diagram of positive ions

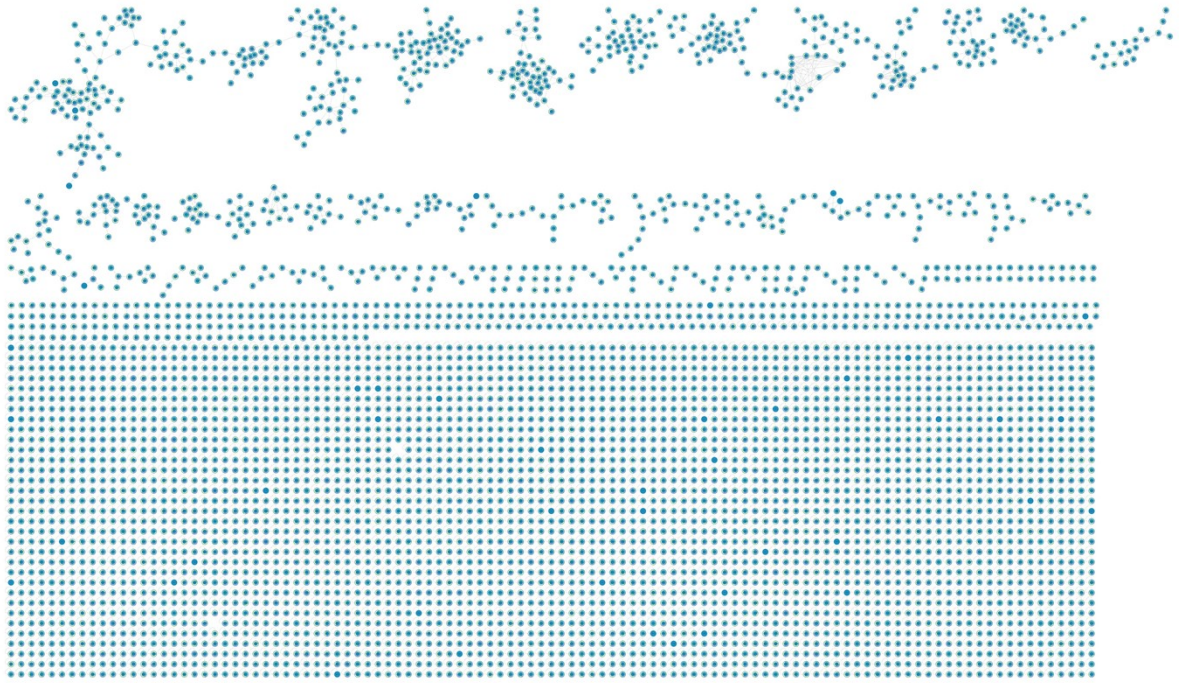

Figure S4. Molecular network diagram of negative ions

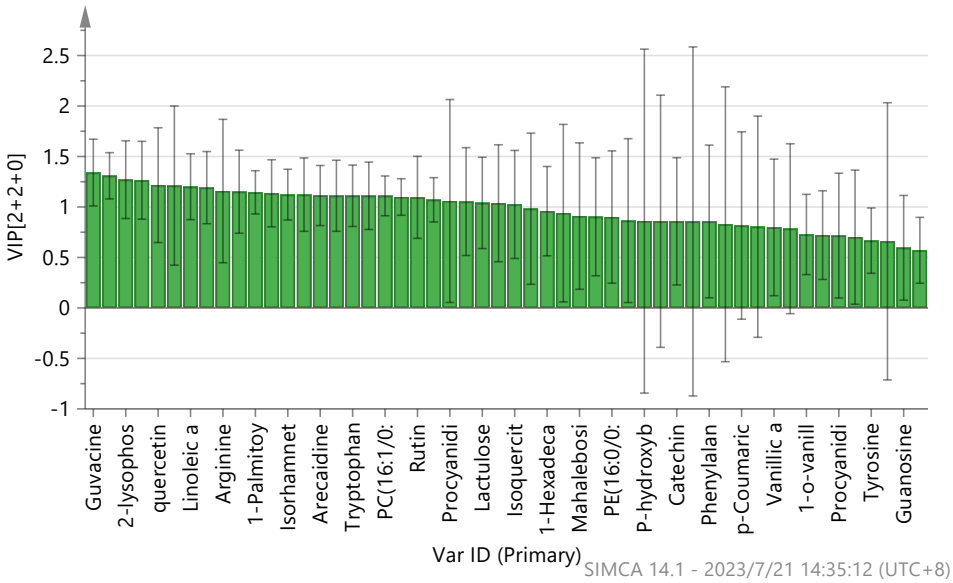

Figure S5. VIP score for differential metabolites

Table S1. Differential compound information of areca nut at different growth stages

Classification	Order	Component	Adduct ion name	P Value	VIP Score
Phenols	1	Isoquercitrin	[M+H]+	<0.05	1.02505
	2	Kaempferol-3-o-rutinoside	[M+H]+	<0.05	1.0369
	3	Chalconaringenin	[M+H]+	<0.05	1.05346
	4	Isorhamnetin	[M+H]+	<0.05	1.12229
	5	Rutin	[M-H]-	<0.05	1.09548
	6	quercetin	[M-H]-	<0.05	1.2162
Alkaloid	7	n-Butyl-1-methyl-1,2,5,6-tetrahydronicotinate	[M+H]+	<0.05	1.21162
	8	Arecoline	[M+H]+	<0.05	1.26452
	9	Arecaidine	[M+H]+	<0.05	1.11351
	10	Guvacoline	[M+H]+	<0.05	1.30883
	11	Guvacine	[M+H]+	<0.05	1.34085
	12	Methyl nicotinate	[M+H]+	<0.05	1.11072
Lipid	13	PE(18:2/0:0)	[M+H]+	<0.05	1.13561
	14	PE(18:1/0:0)	[M+H]+	<0.05	1.09883
	15	PC(18:2/0:0)	[M+H]+	<0.05	1.1222
	16	2-lysophosphatidylcholine	[M+H]+	<0.05	1.27038
	17	PC(16:1/0:0)	[M+H]+	<0.05	1.10996
	18	1-Palmitoyl-sn-glycero-3-phosphocholine	[M+H]+	<0.05	1.14493
	19	Linoleic acid	[M+H]+	<0.05	1.20066
	20	Linolenic acid	[M+H]+	<0.05	1.15107
Amino acid	21	Tryptophan	[M+H]+	<0.05	1.1108
	22	N-(1-Deoxy-1-fructosyl)phenylalanine	[M+H]+	<0.05	1.11096
	23	Arginine	[M+H]+	<0.05	1.1578
Carbohydrate	24	Lactulose	[M+NH4]+	<0.05	1.04018
Nucleoside	25	Uridine	[M+H]+	<0.05	1.19155

Table S2. Validation results of instrument sensitivity for the analytical methods

Component	Adduct ion name	a	b	R^2	LOD(ng·ml^{-1})	LOQ(ng·ml^{-1})	Linear range (ng·mL^{-1})
Arecoline	[M+H]+	3,550,695.3567	44,681.0278	0.9943	3	9	12.5-250
Arecaidine	[M+H]+	1,060,295.7567	16,530.1329	0.9945	2	10	12.5-500
Guvacoline	[M+H]+	703,856.6405	15,955.3649	0.9997	3	12	12.5-500
Guvacine	[M+H]+	184,242.7927	1,931.3415	0.9975	3	9	12.5-500
Quercetin	[M-H]-	1,194,726.8370	18,319.5304	0.9999	5	15	20-10000
Epicatechin	[M-H]-	513,679.5136	-10,432.6999	0.9998	3	9	20-10000
Rutin	[M-H]-	852594.2485	-21103.6357	0.9996	2	16	20-10000

Table S3. Validation results of Intraday and interday precision for the analytical methods

Component	Adduct ion name	Intraday precision RSD%	Interday precision RSD%	Reproducibility RSD%
Arecoline	[M+H]+	3.69	10.36	7.36
Arecaidine	[M+H]+	3.18	11.86	10.66
Guvacoline	[M+H]+	8.32	14.52	13.86
Guvacine	[M+H]+	12.55	13.01	14.36
Quercetin	[M-H]-	5.69	13.69	12.54
Epicatechin	[M-H]-	11.23	11.63	10.45
Rutin	[M-H]-	1.56	9.85	8.86

Table S4. Extraction recovery rate of areca nut extract

Component	Recovery rate(%)		
	20 ng/mL	200 ng/mL	1000 ng/mL
Arecoline	86.02±1.23	90.36±0.92	93.21±6.35
Arecaidine	96.24±2.47	90.43±5.97	83.63±3.45
Guvacoline	81.36±1.23	85.39±12.35	82.36±5.46
Guvacine	93.14±4.58	102.37±7.56	100.02±3.89
Quercetin	95.74±8.56	82.71±1.78	92.78±8.10
Epicatechin	83.67±14.02	103.64±6.47	91.07±6.57
Rutin	92.77±0.23	82.77±7.28	80.46±8.86