

Article

Effects of Exogenous Spermidine on Root Metabolism of Cucumber Seedlings under Salt Stress by GC-MS

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Supplementary Figure File

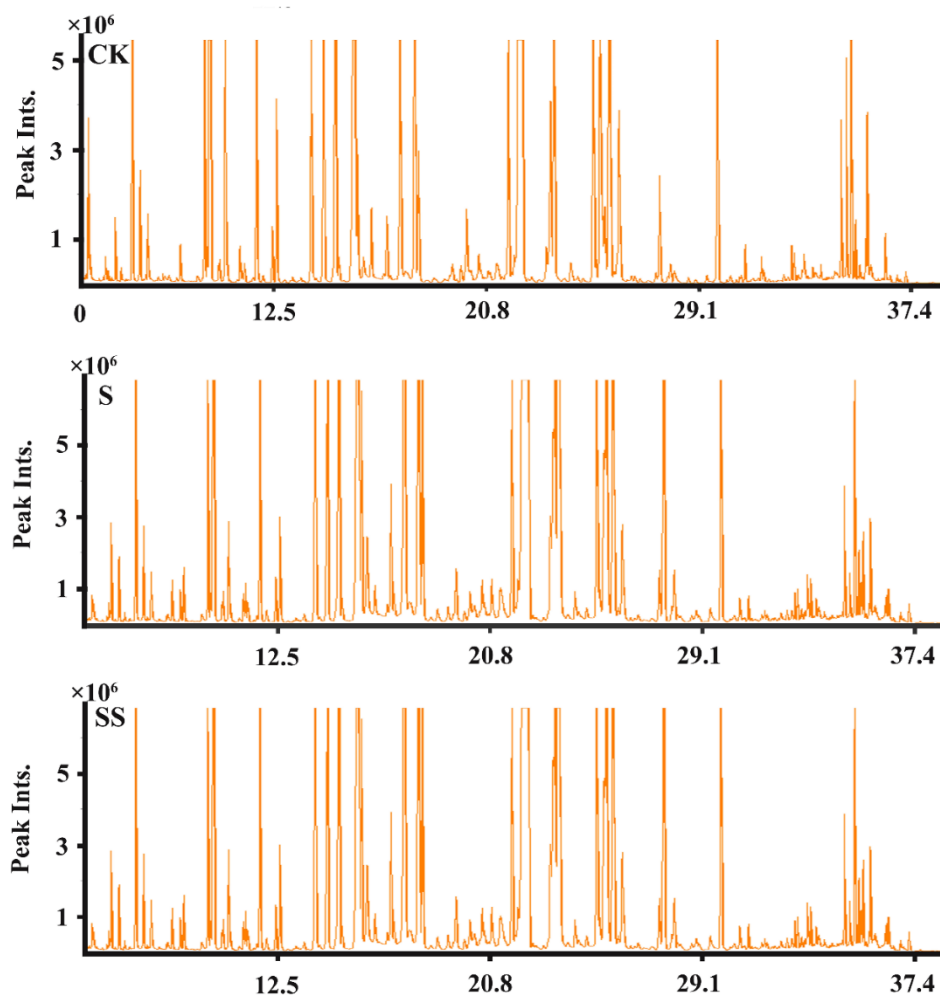


Figure S1. Total ion chromatogram (TIC) based on GC-MS for the cucumber seedlings root.

CK=control, S= 75 mM NaCl, SS=75 mM NaCl + 0.1 mM Spd.

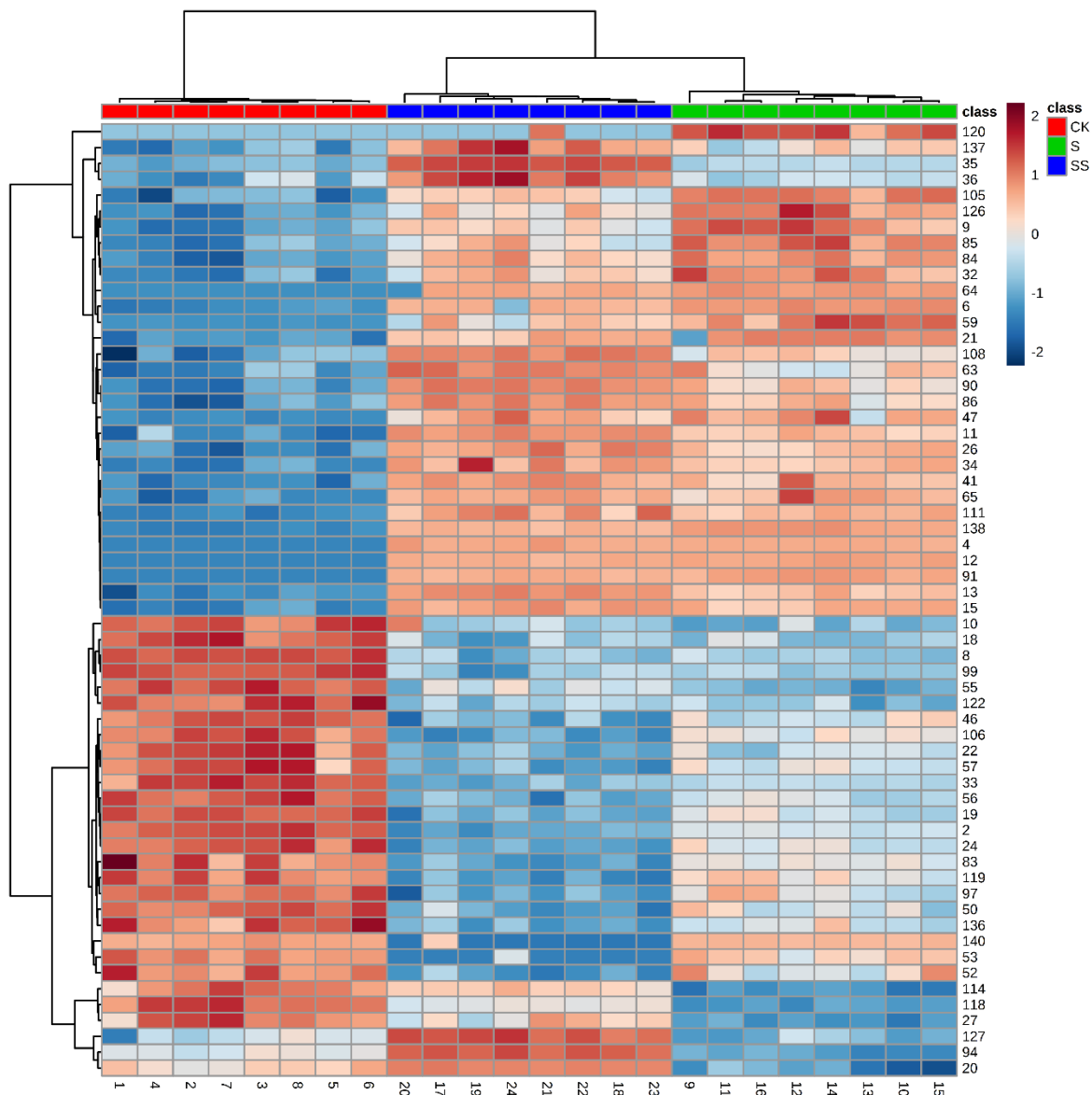


Figure S2. Heatmap analysis combined with hierarchical cluster analysis (HCA) of top 60 metabolites. CK=control, S= 75 mM NaCl, SS=75 mM NaCl + 0.1 mM Spd.

Supplementary Tables

Table S1. The contribution of metabolites in roots to the first principal component (PC1) and the second principal component (PC2).

No.	Metabolite names	PC1	PC2	No.	Metabolite names	PC1	PC2
1	Glucose	0.082	-0.0452	37	Gluconic acid	0.1047	0.0319
2	Glucose-6-P	-0.1166	-0.0372	38	Gluconic lactone	-0.0645	0.07
3	Fructose-6-P	0.0533	0.0195	39	Glucoheptonic acid	0.0669	-0.1356
4	3-PGA	0.1187	-0.0247	40	Galactonic acid	0.1003	-0.0749
5	Pyruvic acid	0.0614	0.0219	41	Threonic acid	0.1166	-0.0142
6	Citric acid	0.1065	-0.0564	42	Lactobionic acid	-0.0844	0.1021
7	α -Ketoglutaric acid	0.0198	0.0829	43	Glucosaminic acid	0.026	-0.1159
8	Succinic acid	-0.1174	0.0157	44	N- β -D-mannosamine	0.0284	0.0326
9	Fumaric acid	0.0979	-0.0986	45	2-Deoxy-D-galactose	0.0877	-0.0898
10	L-Malic acid	-0.1018	0.0685	46	Ribitol	-0.1093	-0.0476
11	Gluconic acid-6-P	0.1164	0.0073	47	Threitol	0.1115	-0.0447
12	Ribulose-5-P	0.1176	-0.0348	48	Allo-inositol	-0.0139	-0.0995
13	Erythrose-P	0.1189	0.0024	49	1,5-Anhydroglucitol	-0.0071	-0.0544
14	myo-Inositol	-0.0933	-0.014	50	Maleic acid	-0.1099	-0.0527
15	Galactinol	0.1186	-0.0114	51	D-glyceric acid	-0.0903	0.0622
16	Raffinose	0.0859	0.0327	52	Glycolic acid	-0.0985	-0.0811
17	Fructose	-0.0852	0.0364	53	2-Furoic Acid	-0.0913	-0.107
18	Mannose	-0.1144	0.0311	54	Lactic acid	-0.0915	-0.069
19	Xylose	-0.1153	-0.0375	55	3-Hydroxypropionic acid	-0.1036	0.0683
20	Erythrose	-0.0075	0.1661	56	3-Hydroxybutyric acid	-0.1149	-0.033
21	Galactose	0.1051	-0.0298	57	2-Hydroxybutanoic acid	-0.1088	-0.0486
22	Sedoheptulose	-0.1125	-0.0197	58	Aminooxyacetic acid	0.0122	0.1329
23	D-Glucoheptose	-0.0071	-0.1445	59	Malonic acid	0.0974	-0.0852
24	D-Talose	-0.1125	-0.0529	60	Benzoic acid	0.0833	0.0766
25	Allose	-0.1087	0.0155	61	Quinoline-4-carboxylic acid	-0.0519	-0.0599
26	D-Altrose	0.1168	0.0038	62	Pyrrole-2-carboxylic acid	-0.0041	-0.1304
27	Maltotriose	-0.0767	0.1268	63	Pipecolic acid	0.1106	0.0318
28	Cellobiose	-0.0965	0.0308	64	2-keto-isovaleric acid	0.1054	-0.0597
29	Leucrose	0.059	-0.0116	65	2-ketobutyric acid	0.1154	-0.0254
30	Trehalose	-0.0279	0.0345	66	Gallic acid	-0.0926	-0.0957
31	Melibiose	-0.0912	-0.0901	67	Pyrogallol	-0.0263	-0.1428
32	Levoglucofan	0.1048	-0.0802	68	1,2,4-Benzenetriol	-0.0602	-0.1272
33	Trehalose-6-P	-0.1171	-0.0043	69	Neohesperidin	-0.0533	-0.0761
34	Glucose-1-P	0.1169	0.0016	70	Acetol	0.034	-0.0778
35	Saccharic acid	0.0916	0.1142	71	Cuminic alcohol	-0.0609	-0.0997
36	Glucuronic acid	0.0901	0.0921	72	Cyclohexane-1,2-diol	-0.0338	0.0299

No.	Metabolite names	PC1	PC2	No.	Metabolite names	PC1	PC2
73	Dodecanol	-0.0707	-0.1158	108	N-Carbamylglutamate	0.1111	0.0304
74	Diglycerol	-0.0695	-0.0714	109	Cycloleucine	0.048	-0.009
75	Glycerol	0.0227	0.0111	110	Cysteinylglycine	0.0893	-0.04
76	Stearic acid	0.0496	-0.0835	111	Maleimide	0.1178	-0.012
77	Palmitic acid	-0.0842	-0.0416	112	Oxamide	0.0261	-0.068
78	Heptadecanoic	-0.083	-0.1103	113	Uracil	-0.0393	-0.108
79	Azelaic acid	-0.0236	-0.1687	114	Thymine	-0.0658	0.1415
80	Monostearin	-0.0612	-0.0714	115	Adenine	-0.0959	-0.079
81	1-Monopalmitin	-0.0136	0.066	116	Uridine	0.0384	0.1363
82	2-Monopalmitin	0.0382	0.1179	117	Guanosine	-0.1029	0.0176
83	L-Glutamic acid	-0.1075	-0.0607	118	Adenosine	-0.0939	0.1111
84	Glutamine	0.1105	-0.0672	119	Inosine	-0.1035	-0.087
85	Ornithine	0.0961	-0.1062	120	Hypoxanthine	0.0493	-0.147
86	Citrulline	0.1151	0.002	121	Carbamoyl-aspartic acid	0.0137	-0.139
87	Proline	0.0694	-0.1212	122	β -Alanine	-0.1107	0.0275
88	4-Aminobutyric	0.0919	0.077	123	3-Aminoisobutyric acid	-0.0449	-0.103
89	Aspartic acid	0.0325	-0.069	124	5,6-Dihydrouracil	-0.0873	-0.114
90	Asparagine	0.1166	0.014	125	Allantoic acid	0.0974	-0.037
91	L-Homoserine	0.1175	-0.0362	126	Urea	0.0984	-0.098
92	Lysine	-0.0821	-0.0785	127	Spermidine	0.0539	0.1492
93	Methionine	-0.0522	0.0481	128	Putrescine	-0.0422	-0.057
94	Threonine	0.0284	0.1689	129	Salicin	-0.0468	-0.124
95	Isoleucine	-0.086	-0.1125	130	Melatonin	-0.0065	-0.004
96	Alanine	-0.0844	0.0988	131	α -Ecdysone	-0.0528	0.0404
97	Leucine	-0.1064	-0.0695	132	Phytosphingosine	0.067	0.0282
98	Valine	0.0616	-0.1498	133	D-Erythro-sphingosine	0.0831	-0.064
99	Glycine	-0.1171	0.0253	134	DL-Dihydrosphingosine	-0.0312	-0.052
100	Serine	-0.0738	0.0973	135	L-Dopa	0.0142	-0.123
101	L-Cysteine	0.0332	-0.1611	136	Dehydroascorbic acid	-0.109	-0.043
102	Tryptophan	0.0703	-0.126	137	Noradrenaline	0.108	0.037
103	Phenylalanine	0.0313	-0.1407	138	22-Ketocholesterol	0.1161	-0.047
104	Tyrosine	-0.0945	-0.0841	139	21-Hydroxypregnenolone	0.0551	-0.149
105	Oxoproline	0.0987	-0.0934	140	7-Hydroxy-4-androstene-3,17-dione	-0.0779	-0.132
106	α -Aminoadipic	-0.1083	-0.0654	141	Nicotinic acid	0.0184	-0.138
107	Creatine degr	0.0538	-0.0864	142	Nicotinamide	-0.0551	-0.029



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