Supplementary material of the manuscript published in Vitis 59, 155–162 (2020):

Diverse and strain-specific metabolites patterns induced by fungal endophytes in grape cells of different varieties

XIAO-XIA PAN^{1), 2)}, MING-QUAN YUAN³⁾, JING-CHAO CHEN⁴⁾, MAN YU⁴⁾, JIN-ZHUO QU⁴⁾, FANG LIU⁴⁾, SI-YU XIANG⁴⁾, YOU-YONG ZHU^{1), 5)} and MING-ZHI YANG⁶⁾

¹⁾ School of Agriculture, Yunnan University, Kunming, China
²⁾School of Chemistry and Environment, Yunnan MinZu University, Kunming, China
³⁾School of Chemistry and Chemical Engineering, Yunnan University, Kunming, China
⁴⁾School of Life Science, Yunnan University, Kunming, China
⁵⁾School of Agronomy, Yunnan Agricultural University, Kunming, China
⁶⁾School of Ecology and Environmental Science, Yunnan University, Kunming, China



Supplementary Fig. 1: Chromatograms of CS grape cell extracts after co-culture with different endophytic fungal strains.



Supplementary Fig. 2: Chromatograms of RH grape cell extracts after co-culture with different endophytic fungal strains.



Supplementary Fig. 3: Clustering of replicates of CS treatments based on the presence/absence of detected metabolites by squared Euclidean distance hierarchical clustering using SPSS 16.0 software.

Supplementary Fig. 4: Clustering of replicates of RH treatments based on the presence/absence of detected metabolites by squared Euclidean distance hierarchical clustering using SPSS 16.0 software.



Supplementary Fig. 5: Results of a preliminary experiment for evaluating the presence of catechin in CS cells treated with strain RH44.

Supplementary Table 1

Acetonitrile-water gradient for methanol extracts of grape cell separation and analysis on reversed-phase HPLC

Time (min)	Flow (mL·min ⁻¹)	% ACN	% Water (mixed with methanol)
0	1	95	5
2	1	90	10
5	1	80	20
8	1	70	30
15	1	60	40
20	1	95	5

Supplementary Table 2

HPLC detected metabolites and contents of CS grape cells (mg $\cdot g^{\cdot l})$

T M	Control	RH7	RH12	RH32	RH34	RH36	RH44	RH47	RH48	RH49	MDR1	MDR3	MDR4	MDR33	MDR36
M1	1.88	1.75	-	1.68	1.06	1.42	0.71	1.11	1.82	0.95	-	-	1.80	-	-
M2	-	-	2.59	-	5.94	-	1.26	1.45	-	3.33	2.55	1.56	1.28	1.07	5.55
M3	0.79	-	4.25	9.22	5.88	4.86	1.71	2.04	1.47	3.35	3.91	1.38	1.92	1.93	9.01
M4	1.21	0.6	0.97	3.17	1.55	1.13	1.26	1.56	1.92	1.31	1.12	0.99	1.80	0.88	1.87
M5	-	-	1.26	0.95	0.47	1.15	1.97	1.59	-	2.46	0.86	1.49	-	3.27	7.17
M6	-	-	-	-	0.86	-	-	-	-	-	-	-	-	-	-
M7	0.42	1.26	16.68	10.17	13.92	10.94	4.33	16.45	0.71	11.92	14.99	24.15	16.99	11.78	5.49
M8	0.83	-	1.33	0.70	0.75	1.13	-	0.93	0.59	1.18	1.73	1.65	-	0.66	1.99
M9	-	0.66	4.04	0.39	-	-	-	-	-	-	2.78	2.06	1.34	3.48	5.57
M10	0.36	-	-	1.00	1.74	1.88	-	1.72	-	1.65	-	-	-	-	-
M11	1.07	-	-	0.95	-	-	-	-	-	1.75	-	-	3.15	-	-
M12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M13	7.32	0.58	-	6.62	8.42	6.85	-	-	7.68	13.56	-	-	1.09	1.88	-
M14	13.23	7.01	1.66	16.42	17.16	10.04	4.58	1.59	12.61	13.32	9.23	0.92	1.13	6.51	30.40
M15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M16	-	12.15	-	4.19	10.98	5.62	4.76	8.25	-	6.52	7.58	-	-	2.40	19.15
M17	-	-	0.51	5.47	6.23	-	0.92	-	-	-	1.83	-	8.47	0.54	5.40
M18	1.29	-	-	-	-	1.41	-	4.49	-	-	-	-	0.99	0.62	0.83
M19	-	-	-	-	-	-	-	-	0.98	2.33	-	-	-	-	0.68
M20	-	-	8.33	-	-	-	-	-	0.63	-	7.27	9.56	5.15	5.41	1.50
M21	2.06	2.3	0.28	0.55	1.65	3.08	2.09	0.69	0.27	2.29	0.48	0.41	0.62	0.96	0.38
M22	-	-	0.27	0.75	-	-	-	-	2.00	-	-	-	-	-	1.47
M23	-	-	0.44	0.63	-	-	-	-	-	-	-	-	-	-	-
M24	0.45	0.96	1.49	-	-	0.60	-	-	0.86	-	3.42	0.46	1.51	2.99	3.49
M25	0.76	0.71	0.59	0.42	1.10	0.42	0.78	0.86	0.56	0.73	0.68	1.25	1.11	1.06	1.05
M26	-	-	0.73	-	-	-	-	-	-	-	0.87	0.28	0.63	1.02	0.68
M27	1.21	-	-	1.13	-	-	3.21	-	-	-	1.06	-	1.43	0.61	-
M28	-	-	3.85	-	-	-	-	-	-	-	-	6.42	-	1.02	1.11

Supplementary Table 3

HPLC detected metabolites and contents of RH grape cells (mg $\cdot g^{\cdot l})$

T	Con- trol	RH7	RH12	RH32	RH34	RH36	RH44	RH47	RH48	RH49	MDR1	MDR3	MDR4	MDR33	MDR36
M1	1.60	1.51	1.12	0.47	1.12	1.11	1.39	0.75	1.63	0.68	1.04	1.02	1.55	1.03	2.15
M2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	-	1.49	1.53	11.49	3.26	3.00	1.86	3.43	-	2.15	3.13	1.91	1.29	2.05	7.10
M4	1.69	1.25	1.20	3.38	1.20	1.49	1.40	1.47	1.30	0.96	1.25	1.13	1.35	1.10	2.70
M5	1.35	1.29	1.53	1.39	1.11	1.53	2.13	1.25	1.32	0.98	1.36	1.43	1.70	1.44	2.32
M6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M7	-	1.18	3.02	6.88	2.84	1.48	-	4.95	-	0.66	2.26	1.64	4.09	-	2.85
M8	-	-	0.72	-	-	0.98	-	-	-	-	-	-	-	-	-
M9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M10	-	-	0.39	2.20	-	-	-	-	0.58	-	-	-	-	-	-
M11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M12	-	-	-	-	2.24	-	-	-	-	2.24	-	-	-	-	7.47
M13	4.34	-	-	10.56	1.91	7.31	2.72	-	4.20	-	0.79	1.01	2.44	1.36	12.00
M14	5.78	4.68	0.59	13.35	4.12	10.37	4.40	1.08	5.95	5.02	4.63	4.82	4.88	4.70	14.62
M15	-	-	-	-	-	-	-	-	-	-	-		-	-	3.07
M16	-	2.28	1.66	2.08	3.28	1.26	1.04	3.01	-	2.86	3.35	2.79	3.77	1.81	4.32
M17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M19	-	-	1.17	3.42	-	-	-	1.09	-	-	-	0.77	0.65	-	0.62
M20	-	-	-	-	0.85	-	0.43	-	0.85	-	-	-	-	-	0.81
M21	1.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M22	0.84	1.55	-	0.66	0.91	2.20	1.16	0.46	1.17	1.52	1.52	0.88	1.13	1.22	2.11
M23	-	-	-	-	-	-	-	-	-	-	-		-	-	-
M24	-	-	-	-	-	-	-	-	-	-	-		-	-	-
M25	2.11	-	-	1.02	-	-	-	-	-	-	-	-	-	-	1.09
M26	-	-	-	-	-	-	-	-	-	-	-		-	-	-
M27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-