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Supplementary Information

Desorption electrospray ionization mass spectrometry imaging reveals chemical defense of *Burkholderia seminalis* against cacao pathogens

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23 **Table S1.** Metabolites characterized in *B. seminalis* strain TC3.4.2R3.

m/z **DESI-MSI**	***m/z*** **ESI-MS**	**MS/MS fragment ions**	**Precursor ion**	**Putative assignments**	**Δ *m/z* (ppm)**
704	704.5243	704, 563, 156, 137	$[M + H]^+$	PE(33:1)	2
712	712.4907	712, 571, 549, 413, 164, 121	$[M + Na]^+$	PE(32:1)	2
726	726.5061	726, 683, 585, 563, 164, 121	$[M + Na]^+$	PE(33:1)	2
738	738.5066	738, 597, 575, 164, 121	$[M + Na]^+$	PE(34:2)	2
785	785.5041	785, 639, 597, 493, 315, 230, 195, 157	$[M + Na]^+$	Rha-Rha-C14-C14	2.4
799	799.5022	799, 653, 559, 507, 315, 267, 169	$[M + Na]^+$	Rha-Rha-C15-C14	- 2.0
815	815.4928	815, 157	$[M + K]^+$	Rha-Rha-C15-C14	1.2
254	254.9746	254, 155, 91	$[M – H]^-$	Pyrrolnitrin	4
659	659.4692	659, 409, 391, 267, 255, 153	$[M – H]^-$	PA(16:0/17:1)	5
721	721.5063	721, 483, 465, 391, 295, 255, 171, 153	$[M – H]^-$	PG(16:0/16:0)	5
733	733.5062	733, 483, 391, 267, 255, 171, 153	$[M – H]^-$	PG(16:0/17:1)	5
761	761.5381	761, 295, 255, 171, 153	$[M – H]^-$	PG(19:1/16:0)	5

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27 **Table S2.** Metabolites characterized in cacao pathogens.

Pathogens	*m/z* DESI-MSI	*m/z* ESI-MS	MS/MS fragment ions	Precursor ion	Putative assignments	Δ *m/z* (ppm)
M. perniciosa	480	480.3407	480, 421, 327, 290, 289, 287, 277, 191, 185, 149, 145, 127	$[M + H]^+$	PC(O-16:1)	-8.5
	500	500.3519	500, 457, 439, 365, 337, 164, 121	$[M + Na]^+$	Lyso-PE(18:2)	-
	520	520.3146	520, 502, 432, 385, 328, 184, 104	$[M + H]^+$	Lyso-PC(18:2)	-
	738	738.5104	738, 597, 575, 164, 121	$[M + Na]^+$	PE(34:2)	4
	758	758.5736	758, 184	$[M + H]^+$	PC(34:2)	5
	780	780.5555	780, 721, 597, 575, 184, 147	$[M + H]^+$	PC(36:5)	2
	804	804.5551	804, 645, 621, 599, 184, 147	$[M + H]^+$	PC(38:7)	0
	714	714.5109	714, 452, 279, 255, 196, 140	$[M – H]^-$	PE(16:0/18:2)	4
	738	738.5110	738, 476, 279, 196	$[M – H]^-$	PE(18:2/18:2)	4
	758	758.5004	758, 671, 415, 409, 391, 279, 255, 153	$[M – H]^-$	PS(16:0/18:2)	3
	782	782.5003	782, 695, 433, 415, 279, 153	$[M – H]^-$	PS(18:2/18:2)	3
	833	833.5216	833, 553, 391, 279, 255, 241, 223, 153	$[M – H]^-$	PI(16:0/18:2)	3
P. citrophthora	712	712.4906	712, 164, 157	$[M + Na]^+$	PE(32:1)	2
	726	726.5061	726, 585, 563, 164, 121	$[M + Na]^+$	PE(33:1)	2
	756	756.5564	756, 184, 156	$[M + H]^+$	PC(34:3)	3

	758	758.5715	758, 184	$[M + H]^+$	PC(34:2)	5
	780	780.5540	780, 721, 597, 575, 184, 147	$[M + H]^+$	PC(36:5)	2
	804	804.5536	804, 745, 621, 599, 184, 147	$[M + H]^+$	PC(38:7)	0
	435	435.2517	435, 267, 255, 167, 153	$[M – H]^-$	PA(17:1)	0
	481	481.2860	481, 403, 253, 227, 153, 128	$[M – H]^-$	PG(16:1)	-
	595	595.2916	595, 415, 403, 339, 315, 279, 255, 241, 153, 131	$[M – H]^-$	PI(18:2)	4
	733	733.5046	733, 483, 391, 267, 255, 171, 153	$[M – H]^-$	PG(16:0/17:1)	2
	745	745.5060	745, 403, 279, 267, 253, 241, 223, 157, 139, 113	$[M – H]^-$	PG(17:1/17:1) and/or PG(16:1/18:2)	6
P. capsici	712	712.6061	712, 474, 456, 236, 164	$[M + Na]^+$	PE(32:1)	2
	726	726.5041	726, 585, 563, 164, 121	$[M + Na]^+$	PE(33:1)	2

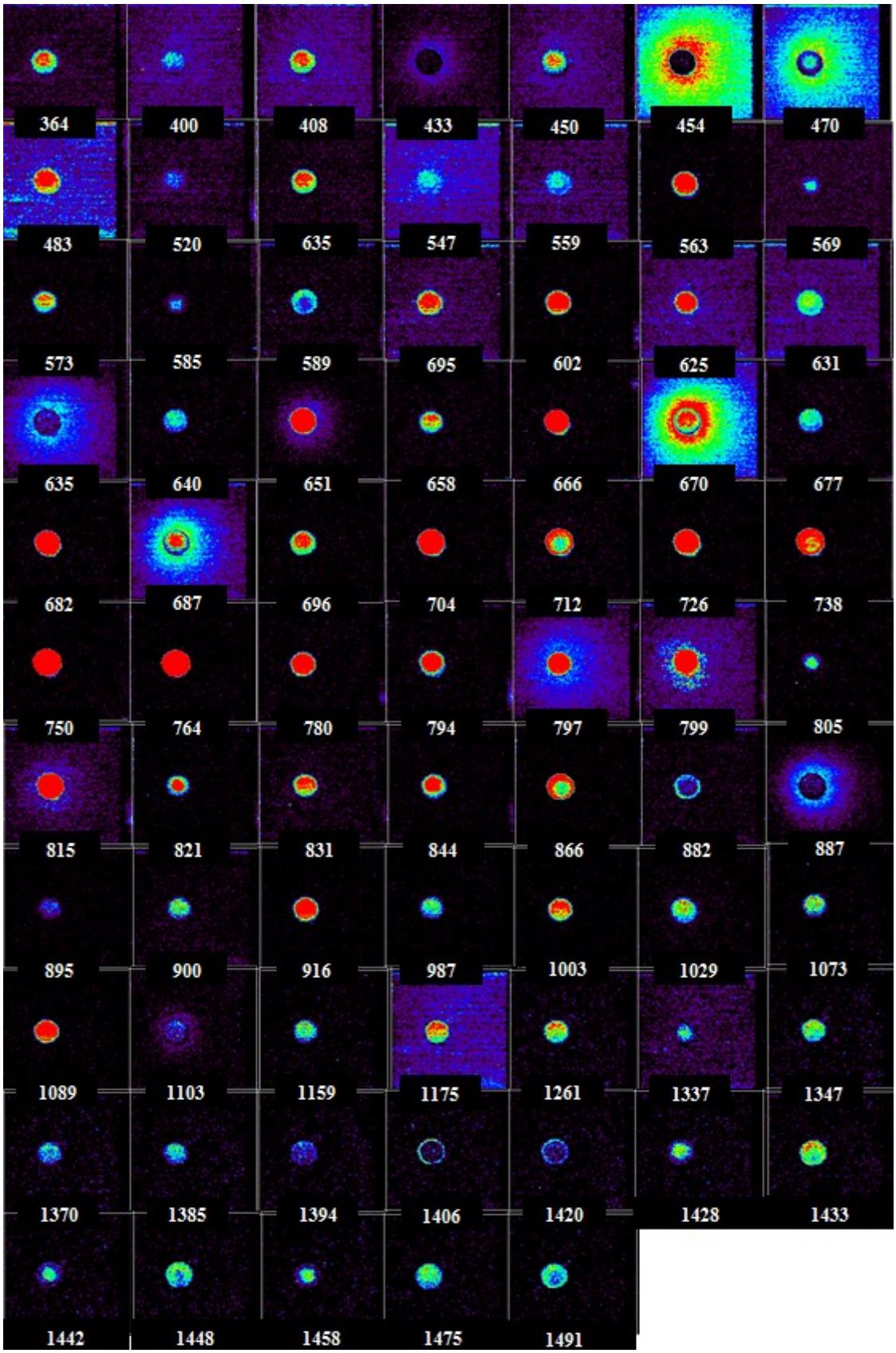


Figure S1. DESI(+)-MSI of *B. seminalis* grown on PDA medium for 48 h.

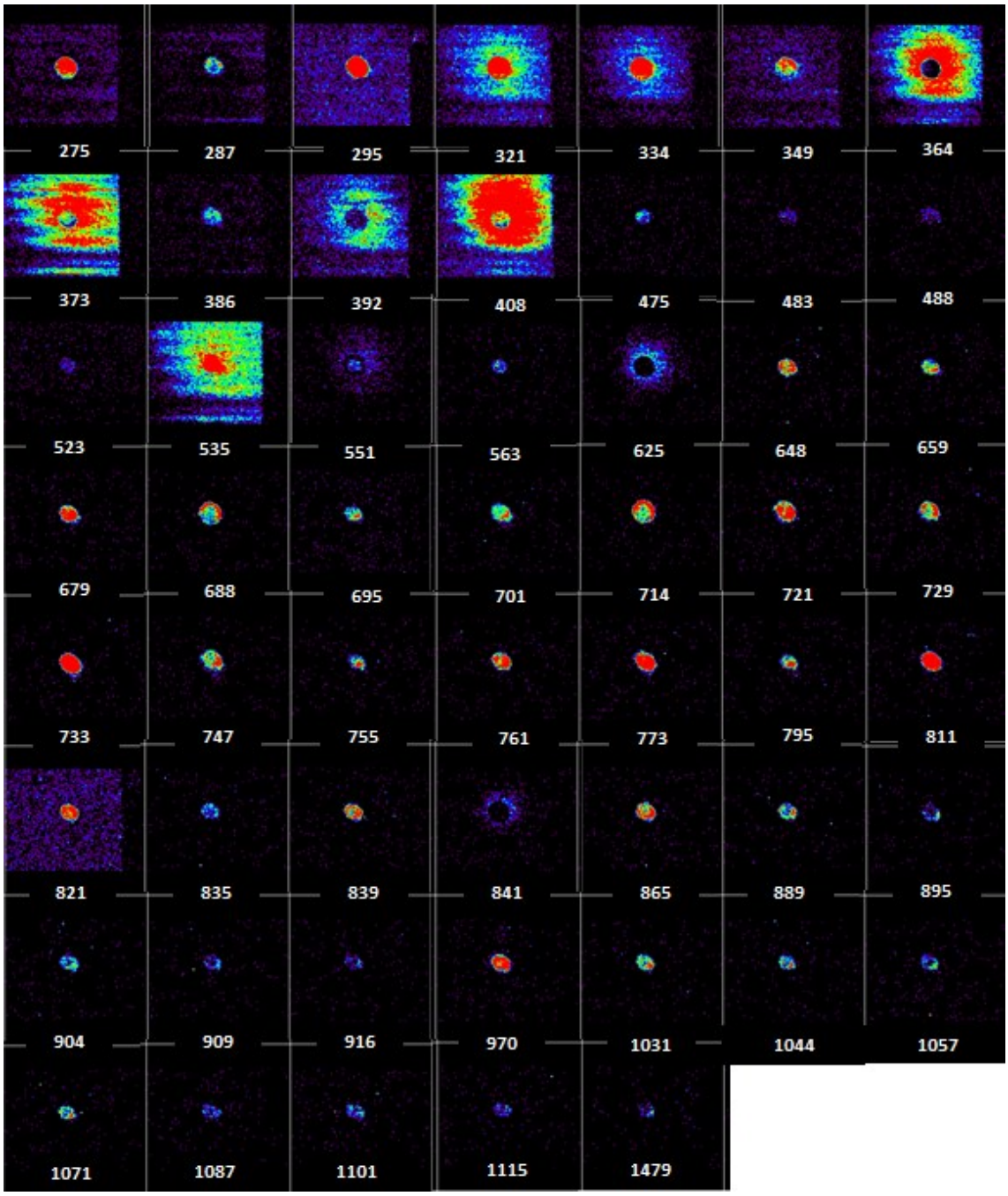


Figure S2. DESI(-)-MSI of *B. seminalis* grown on PDA medium for 48 h.

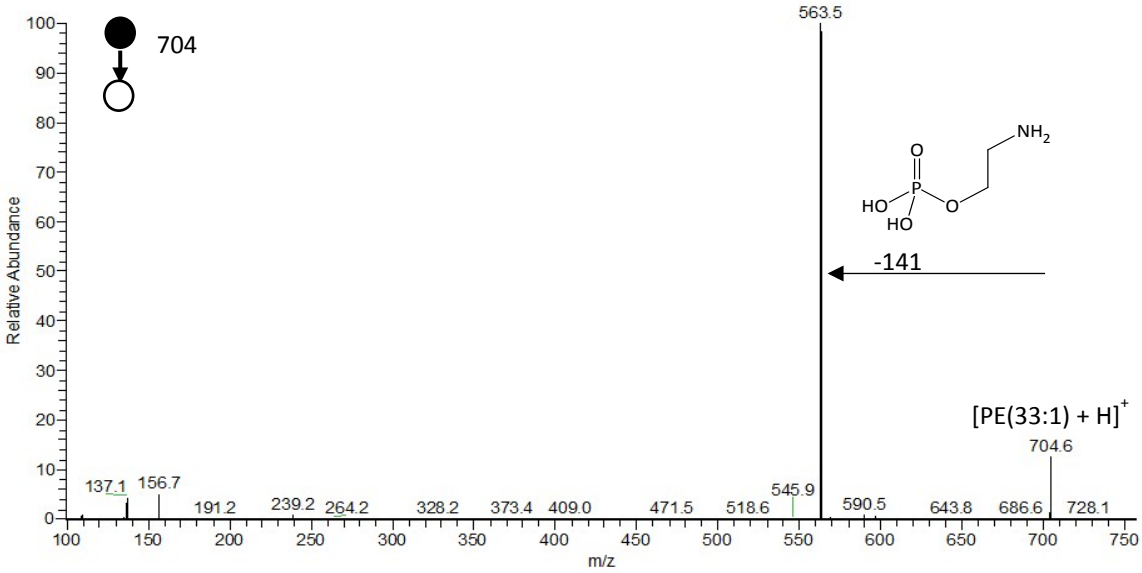


Figure S3. ESI(+)-MS/MS of the metabolite of *m/z* 704 from *B. seminalis*.

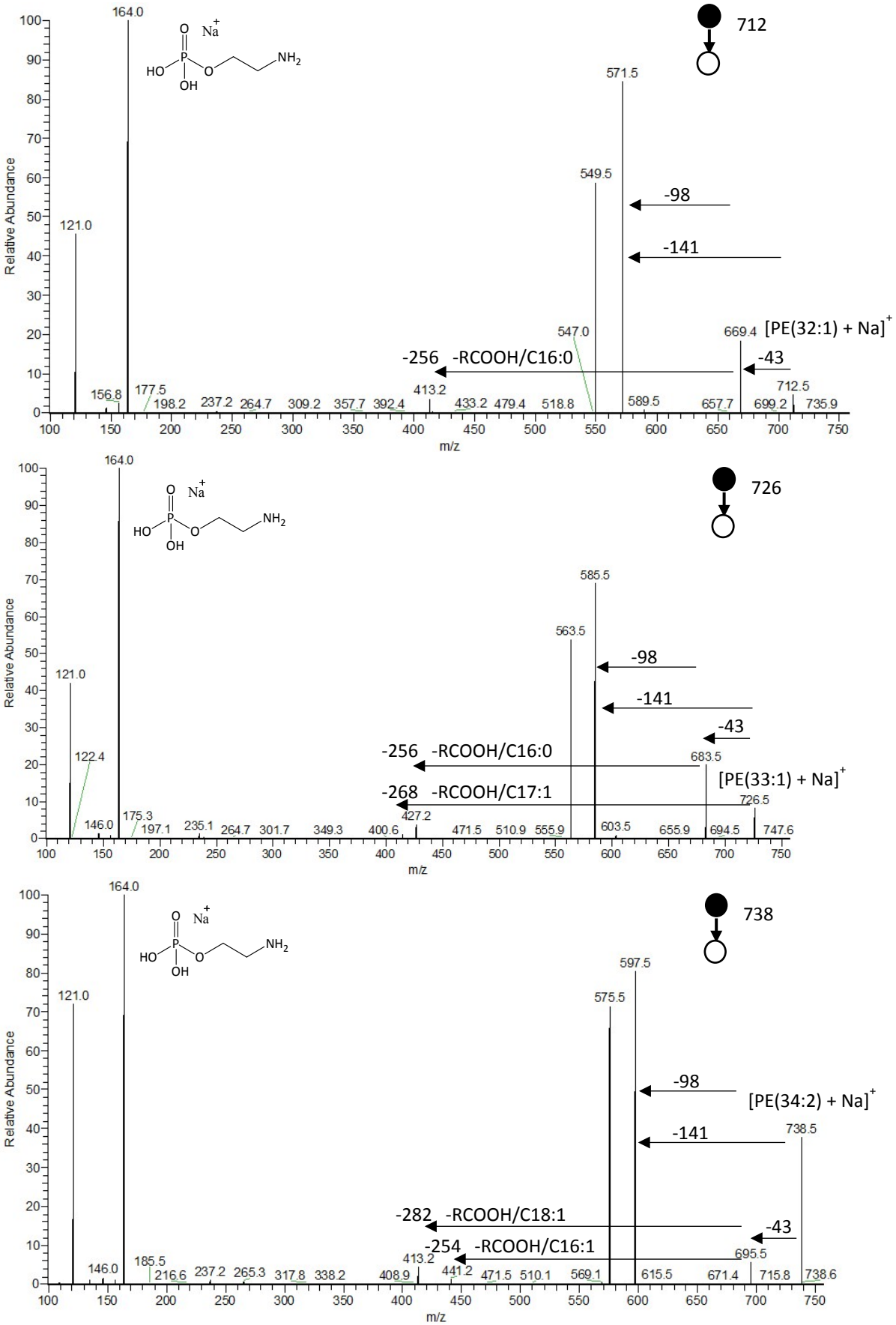


Figure S4. ESI(+)-MS/MS of the metabolites of *m/z* 712, 726, and 738 from *B. seminalis*.

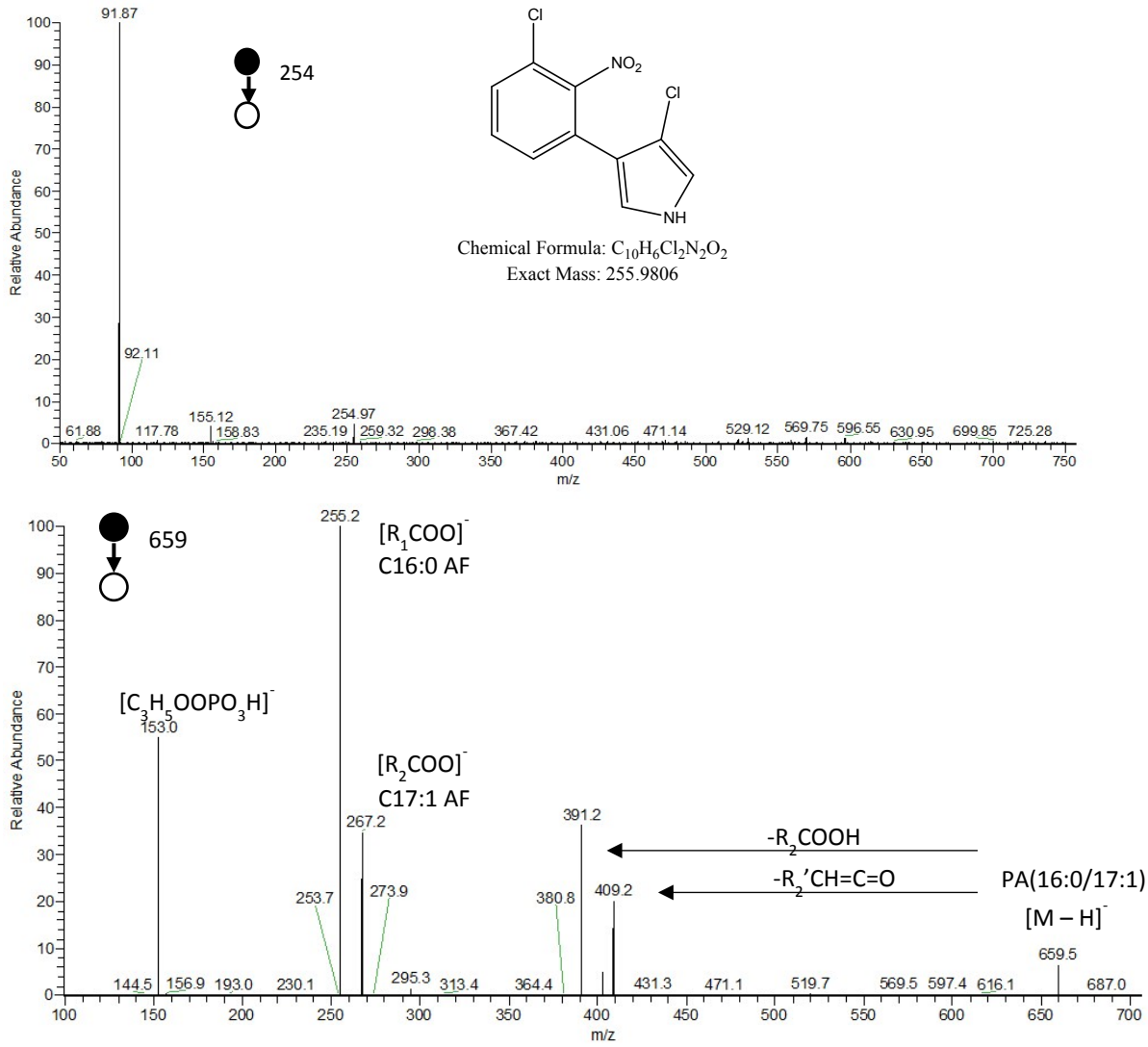


Figure S5. ESI(+)-MS/MS of the metabolites of *m/z* 254 and 659 from *B. seminalis*.

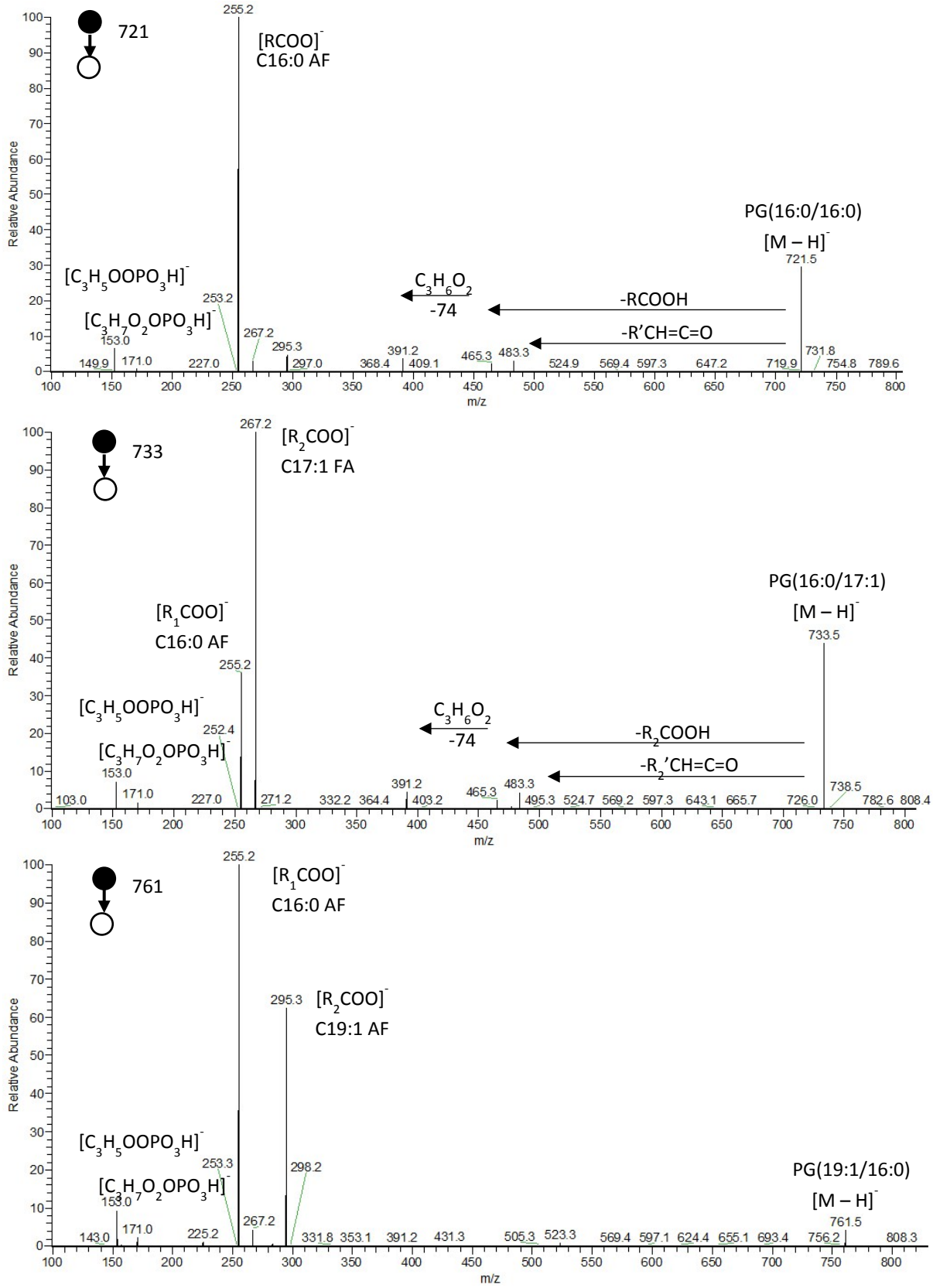
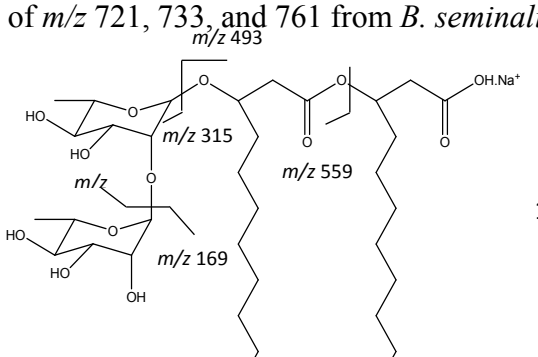


Figure S6. ESI(+)-MS/MS of the metabolite of *m/z* 721, 733, and 761 from *B. seminalis*.



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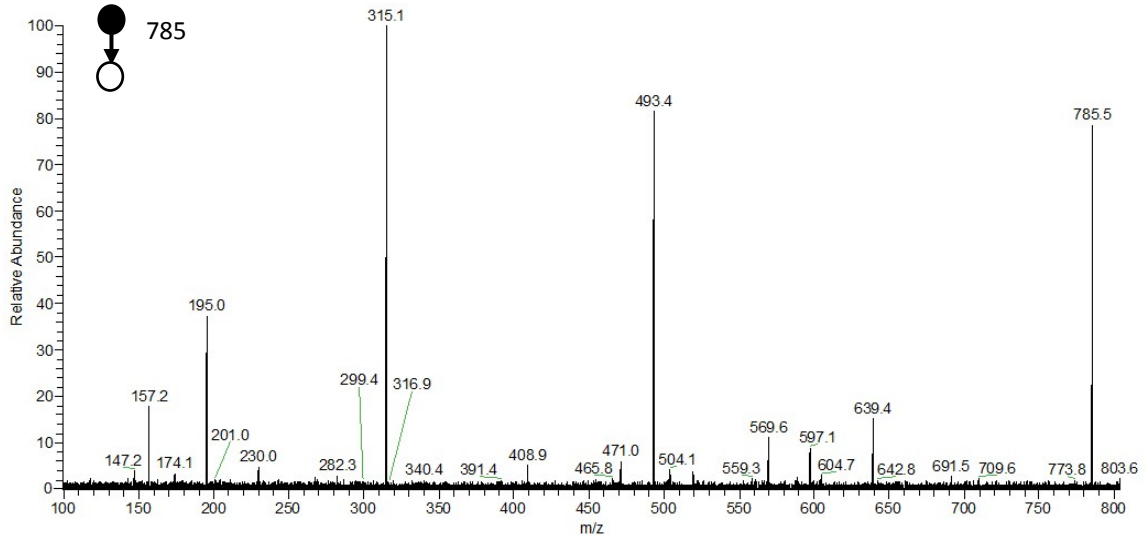

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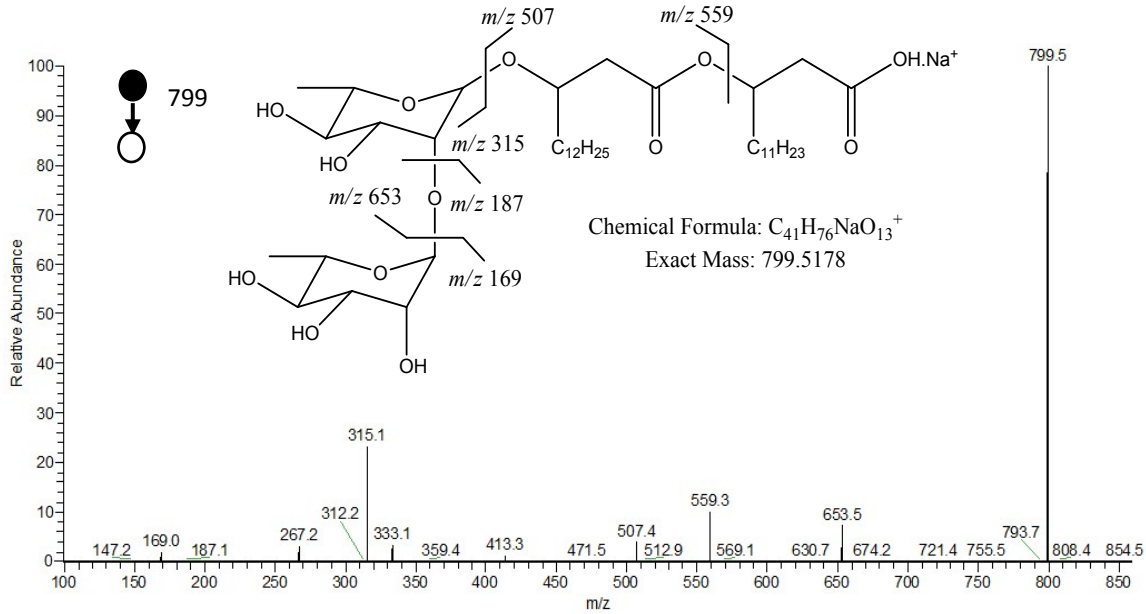

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61 **Figure S7.** ESI(+)-MS/MS of the metabolite of *m/z* 785 and 799 from *B. seminalis*.

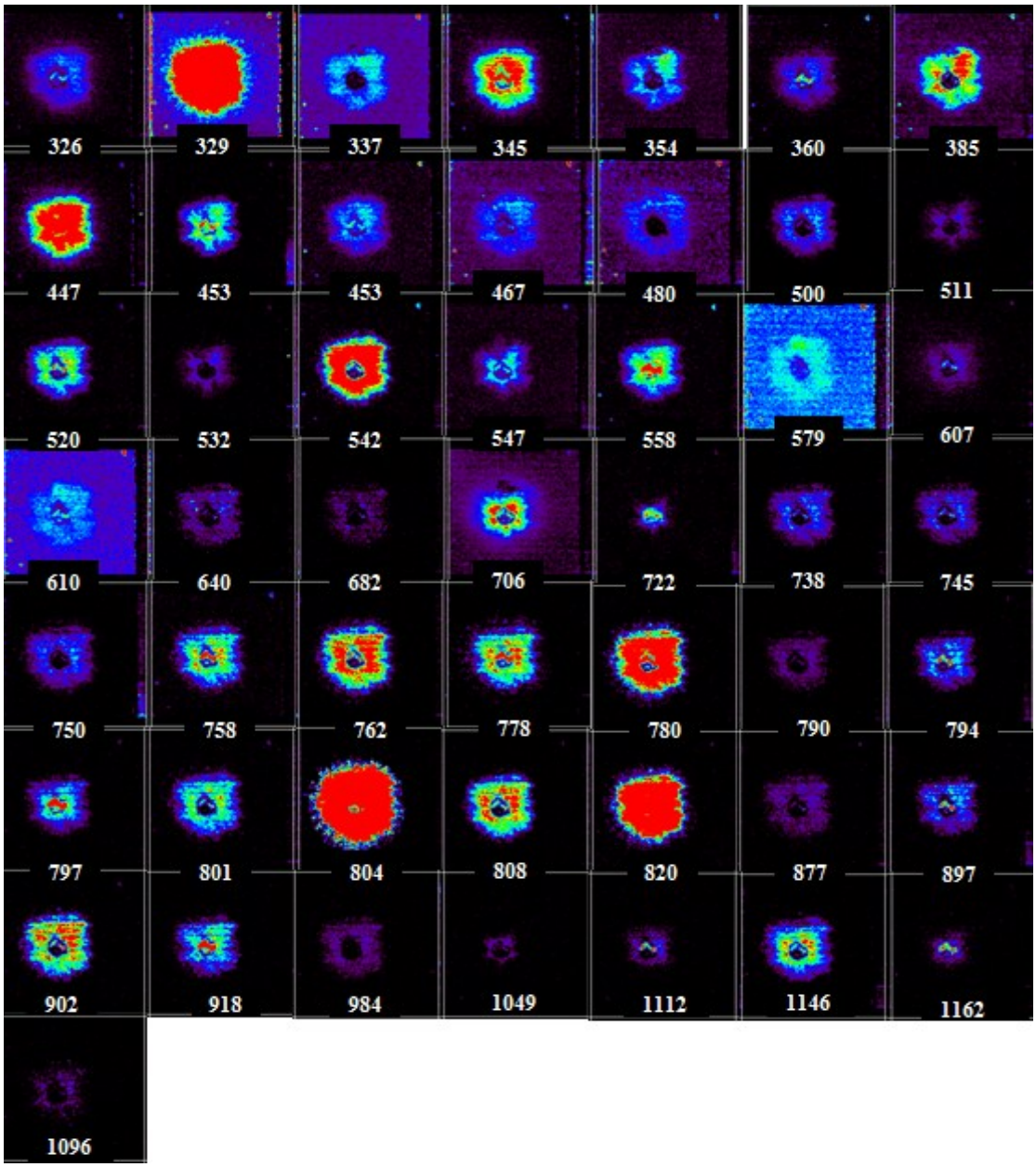


Figure S8. DESI(+)-MSI of *M. perniciosa* grown on PDA medium for 48 h.

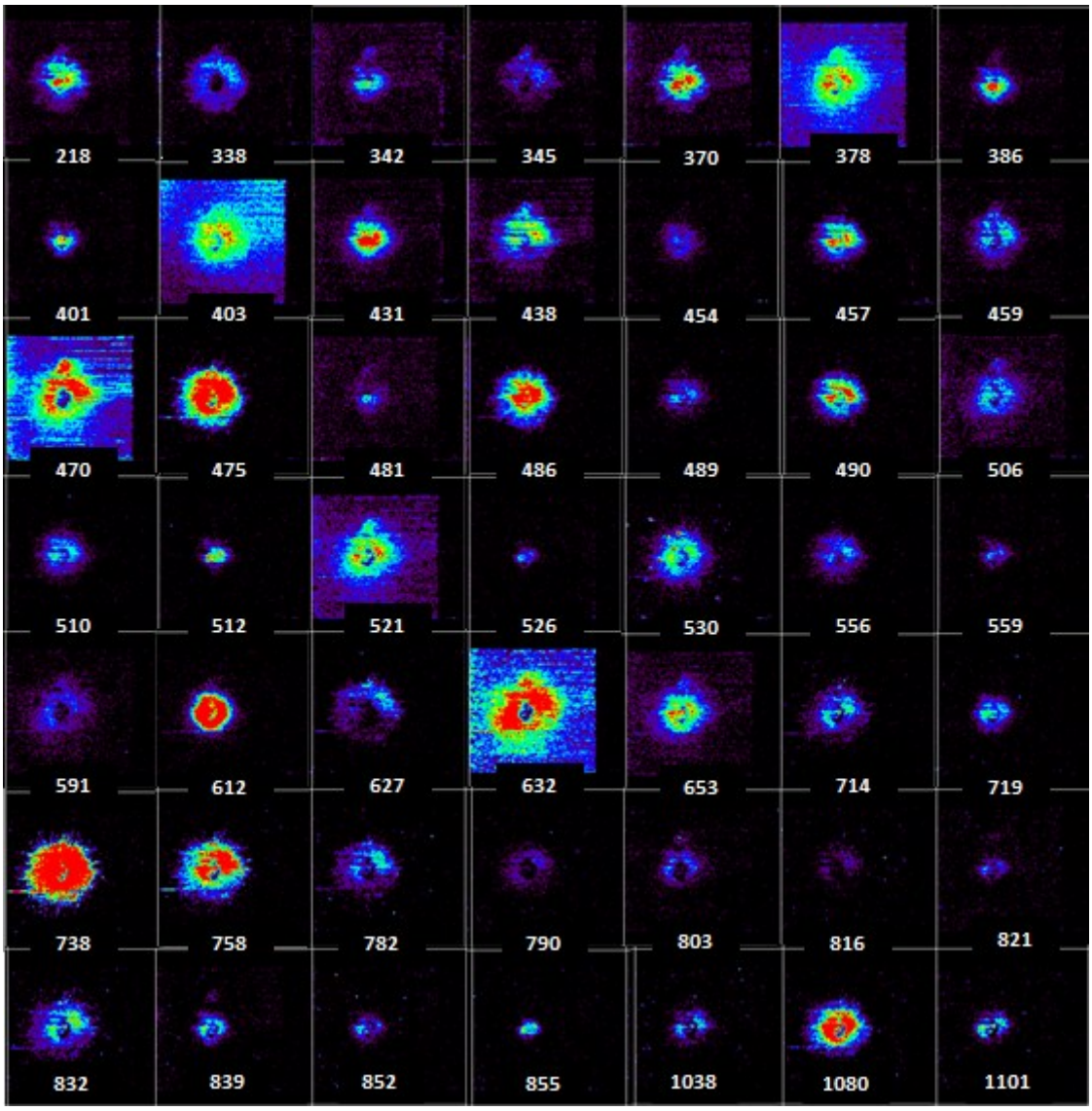


Figure S9. DESI(-)-MSI of *M. perniciosa* grown on PDA medium for 48 h.

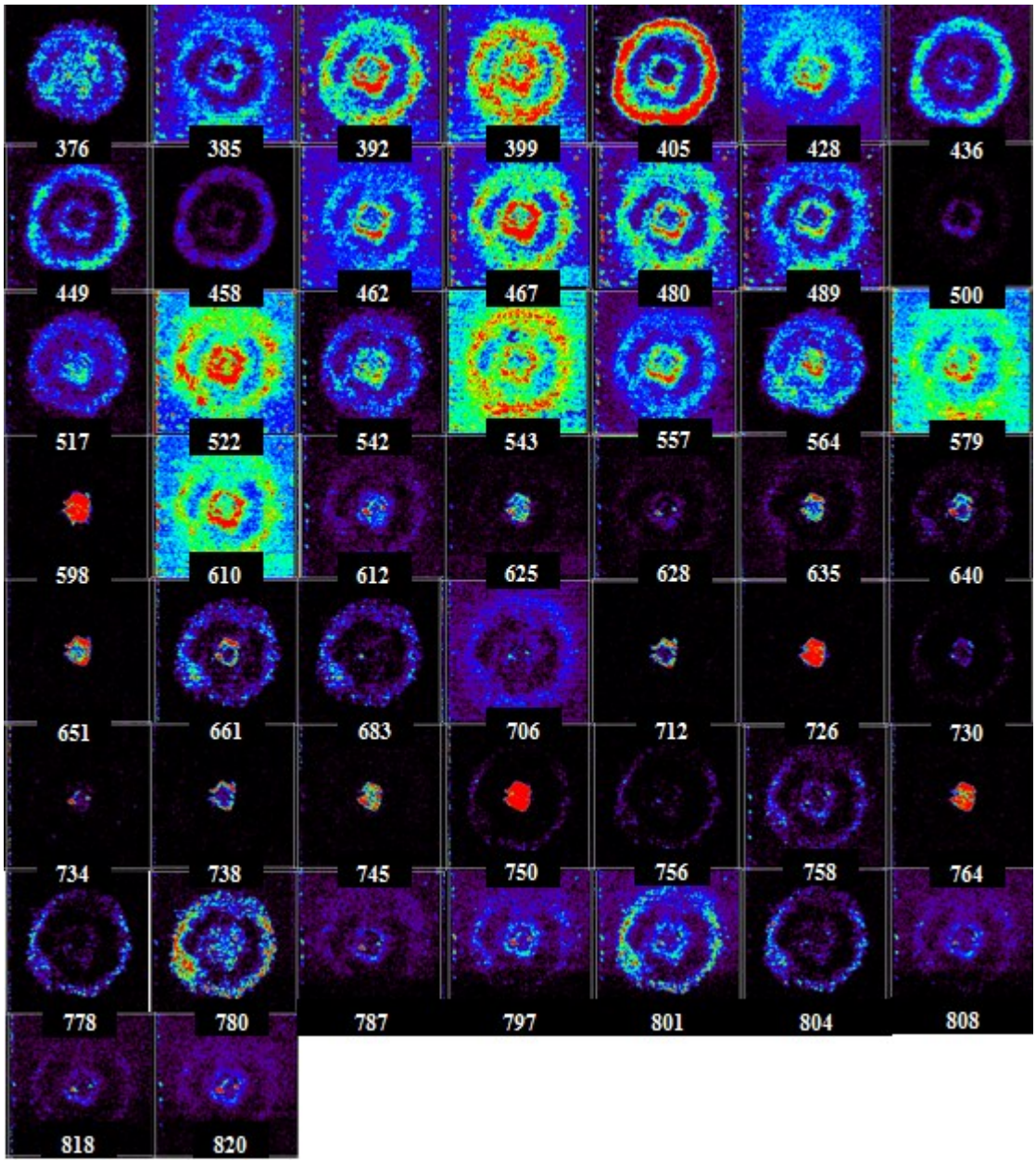


Figure S10. DESI(+)-MSI of *P. citrophthora* grown on PDA medium for 24 h.

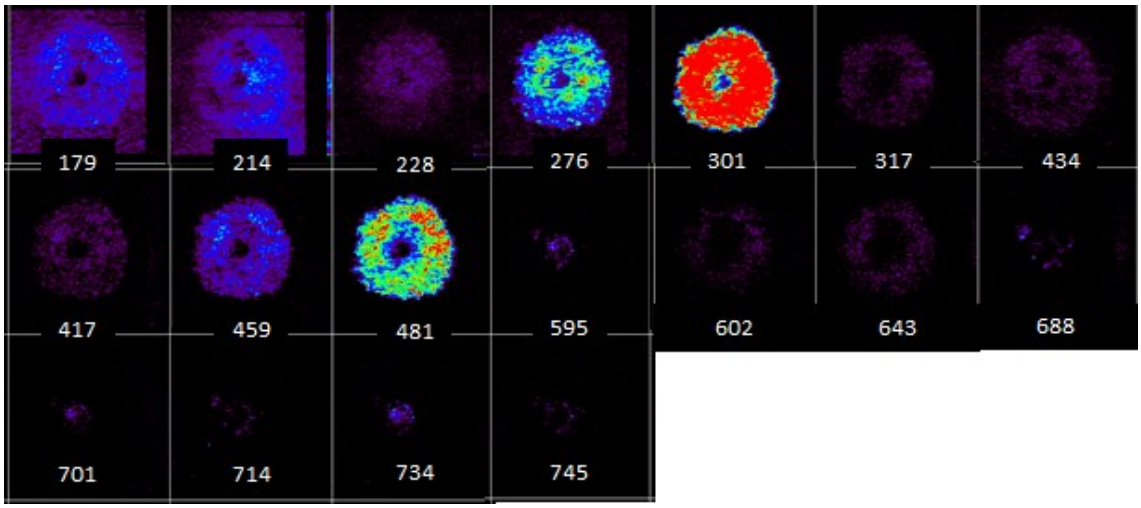


Figure S11. DESI(-)-MSI of *P. citrophthora* grown on PDA medium for 24 h.

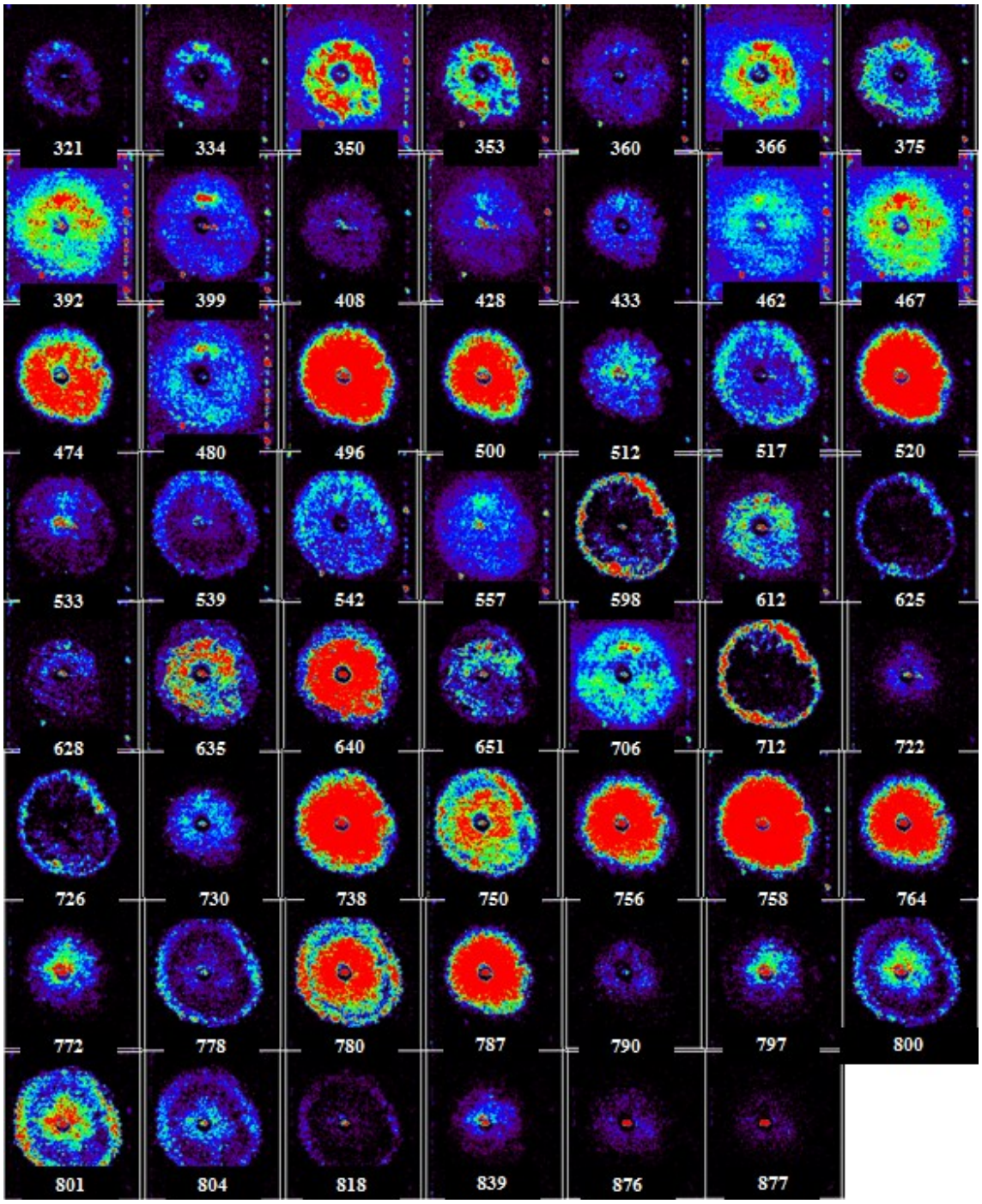


Figure S12. DESI(+)-MSI of *P. capsici* grown on PDA medium for 12 h.

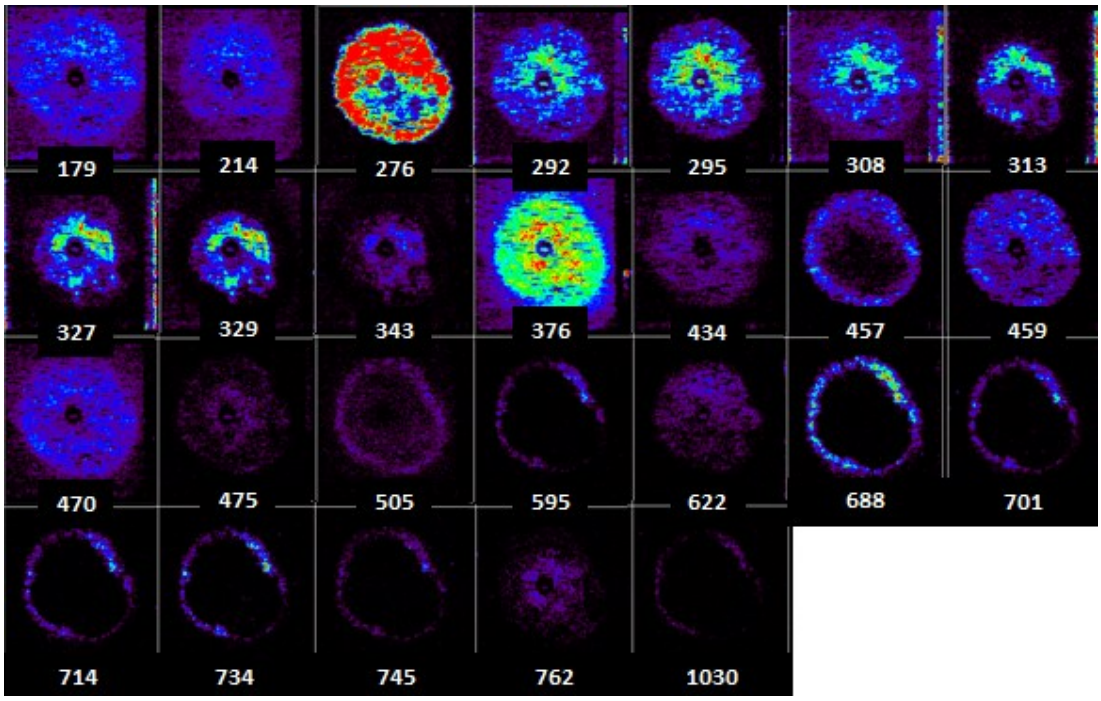


Figure S13. DESI(-)-MSI of *P. capsici* grown on PDA medium for 12 h.

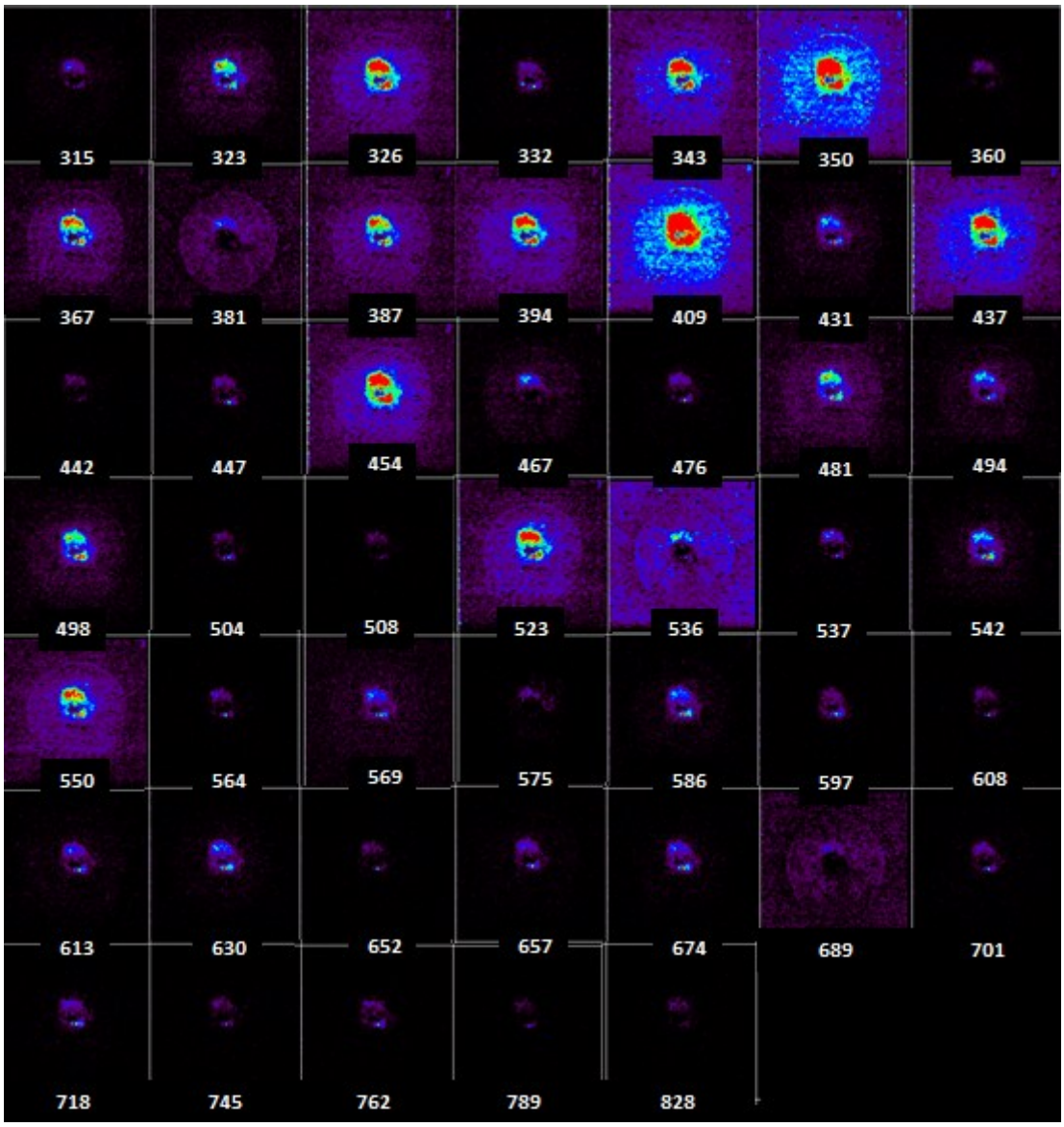


Figure S14. DESI(+)-MSI of *P. palmivora* grown on PDA medium for 48 h.

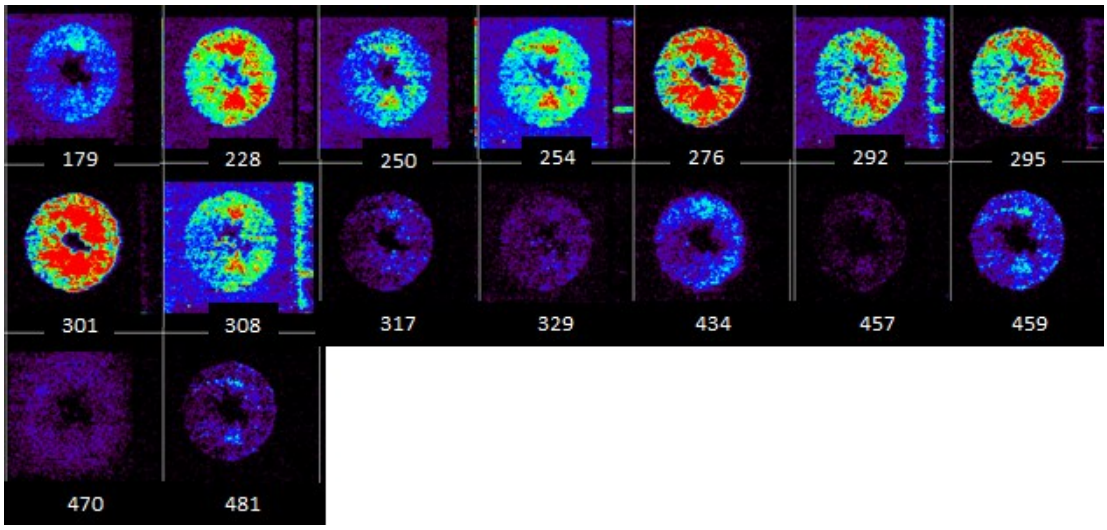
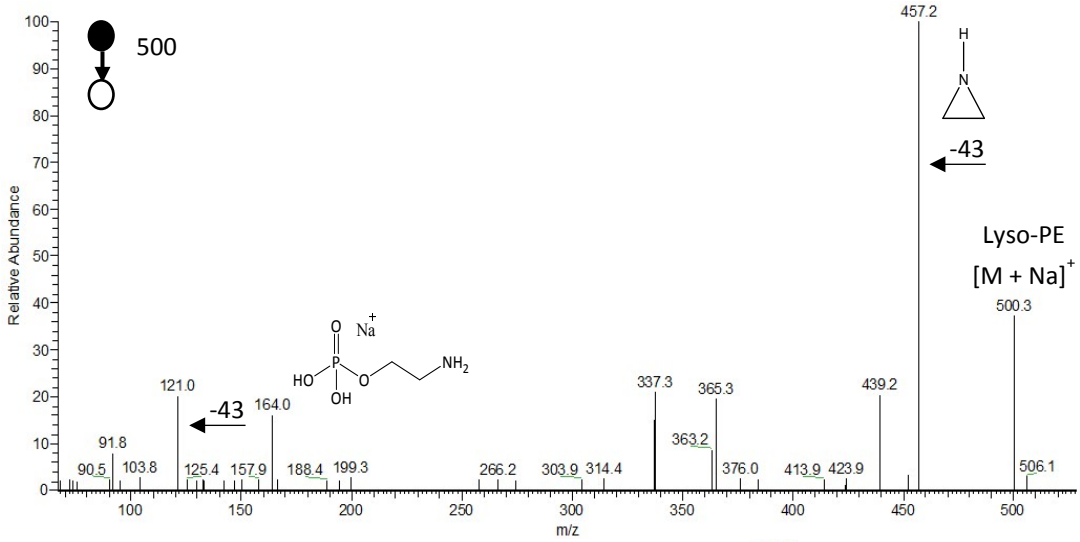


Figure S15. DESI(-)-MSI of *P. palmivora* grown on PDA medium for 48 h.



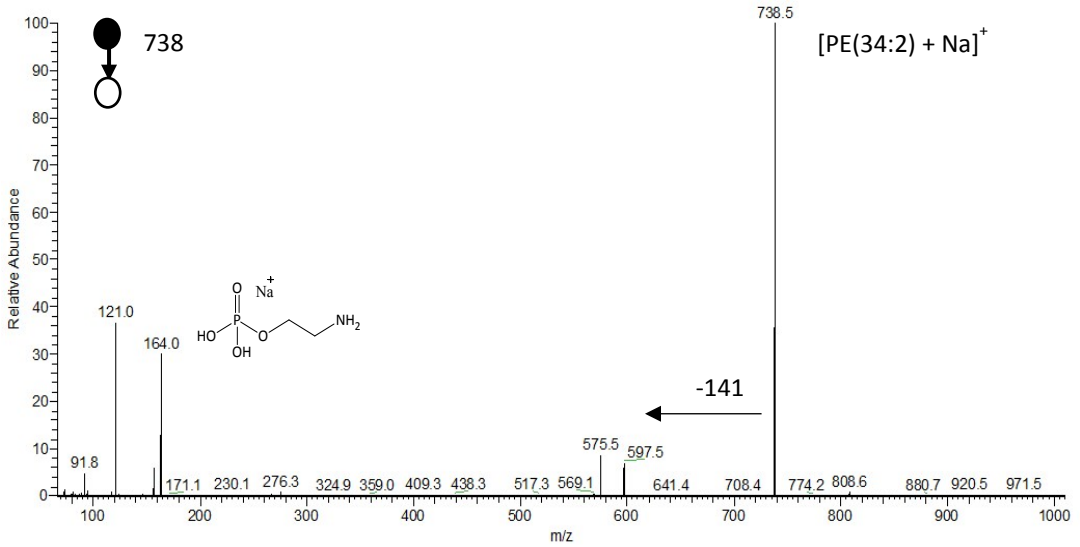


Figure S16. ESI(+)-MS/MS of the metabolite of *m/z* 500 and 738 of *M. perniciosa*.

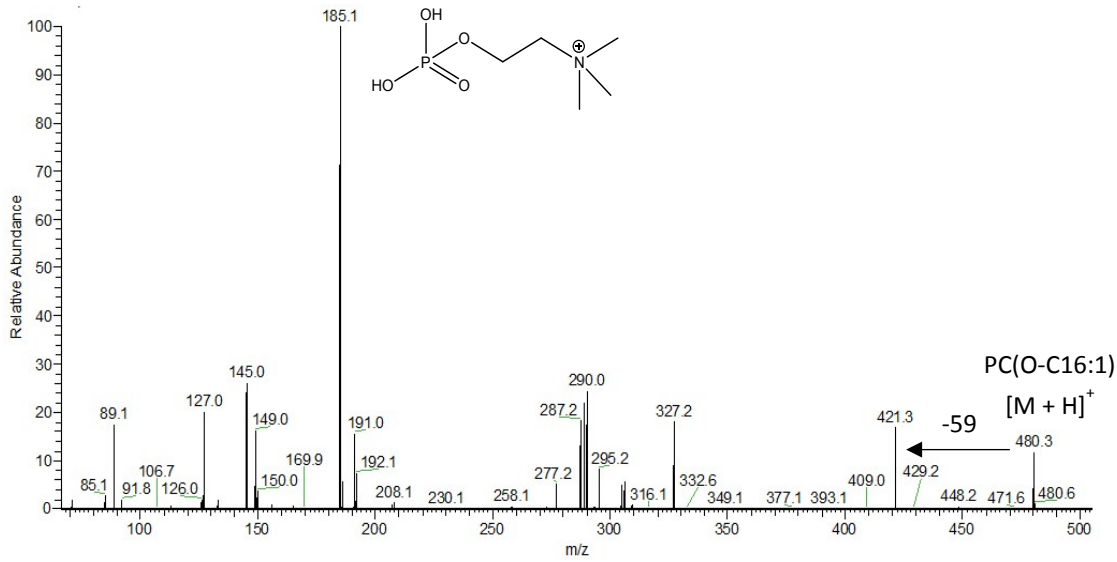


Figure S17. ESI(+)-MS/MS of the metabolite of *m/z* 480 of *M. perniciosa*.

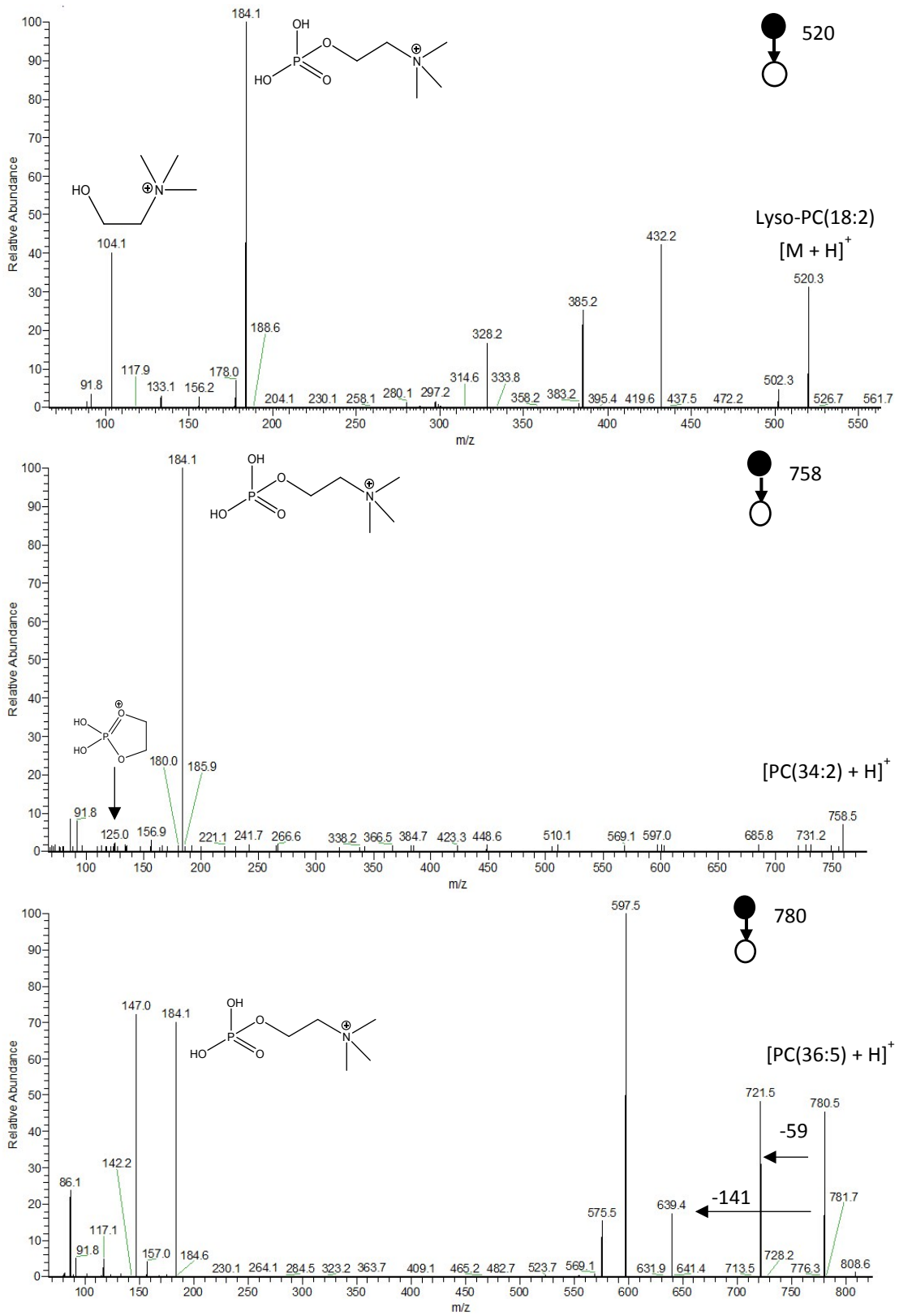


Figure S18. ESI(+)-MS/MS of the metabolites of *m/z* 520, 758, and 780 of *M. perniciosa*.

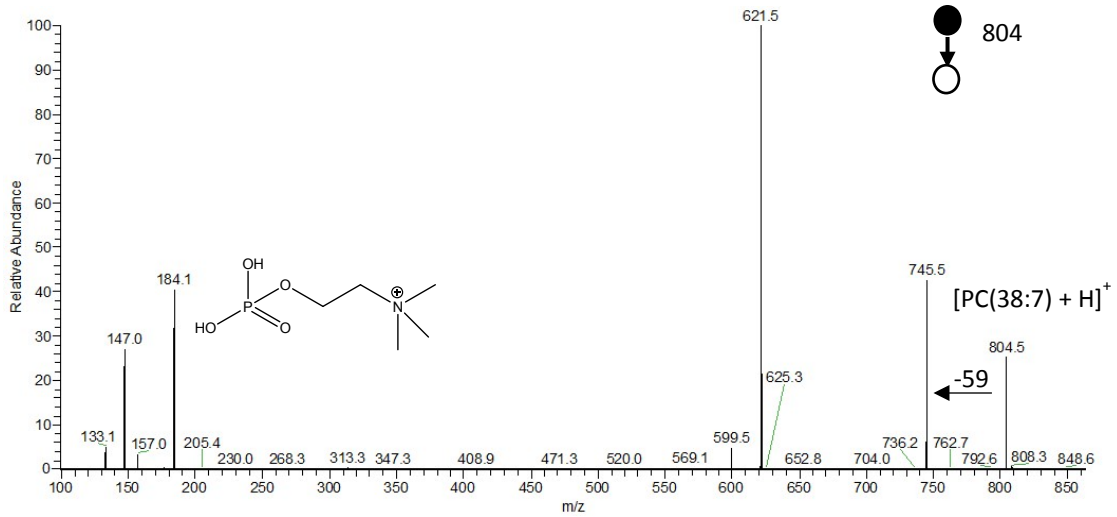
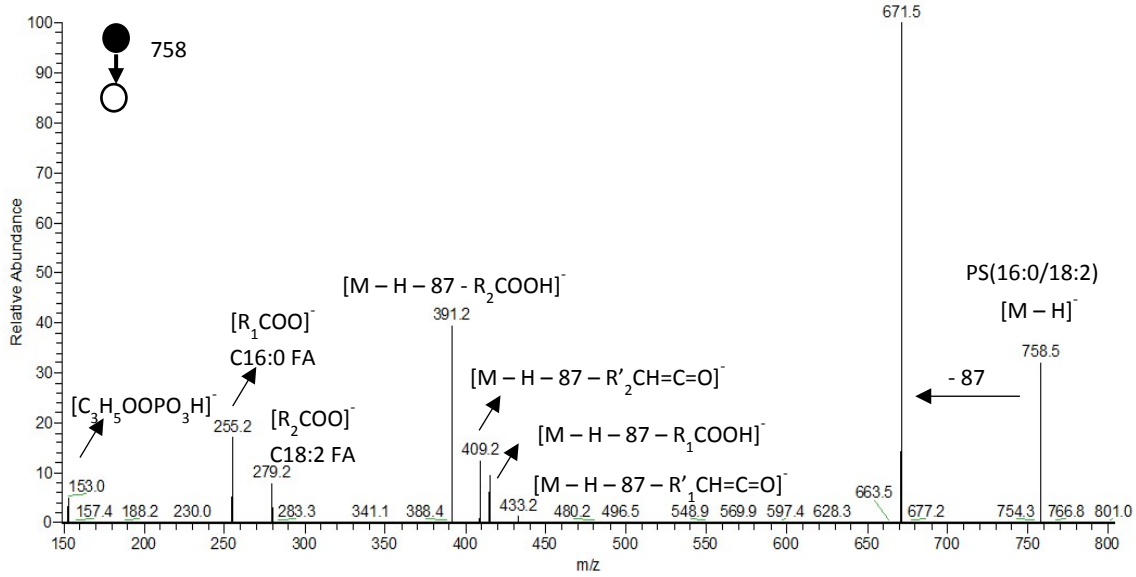


Figure S19. ESI(+)-MS/MS of the metabolite of *m/z* 804 of *M. perniciosa*.



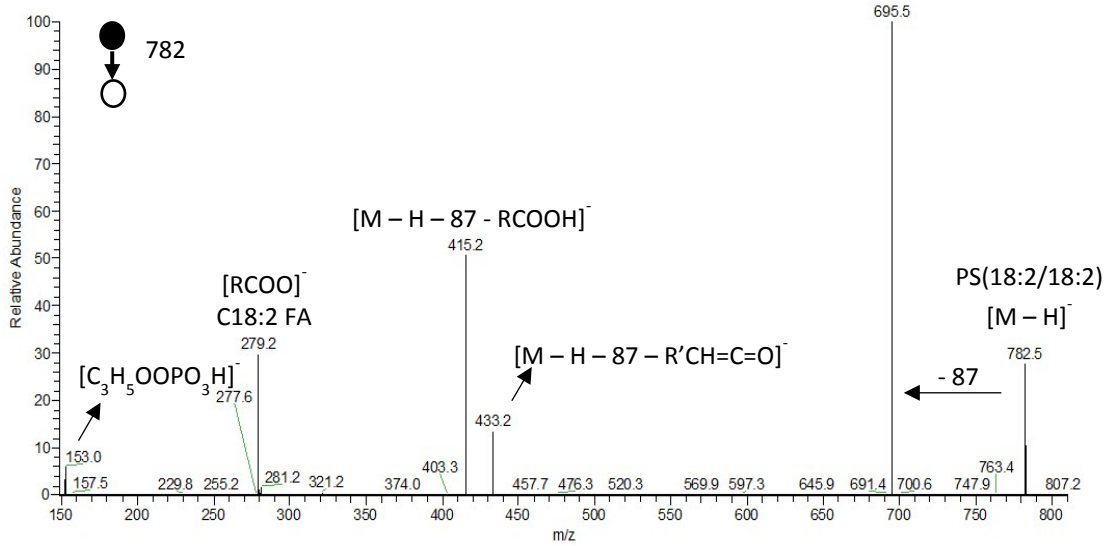


Figure S20. ESI(-)-MS/MS of the metabolites of *m/z* 758 and 738 of *M. perniciosa*.

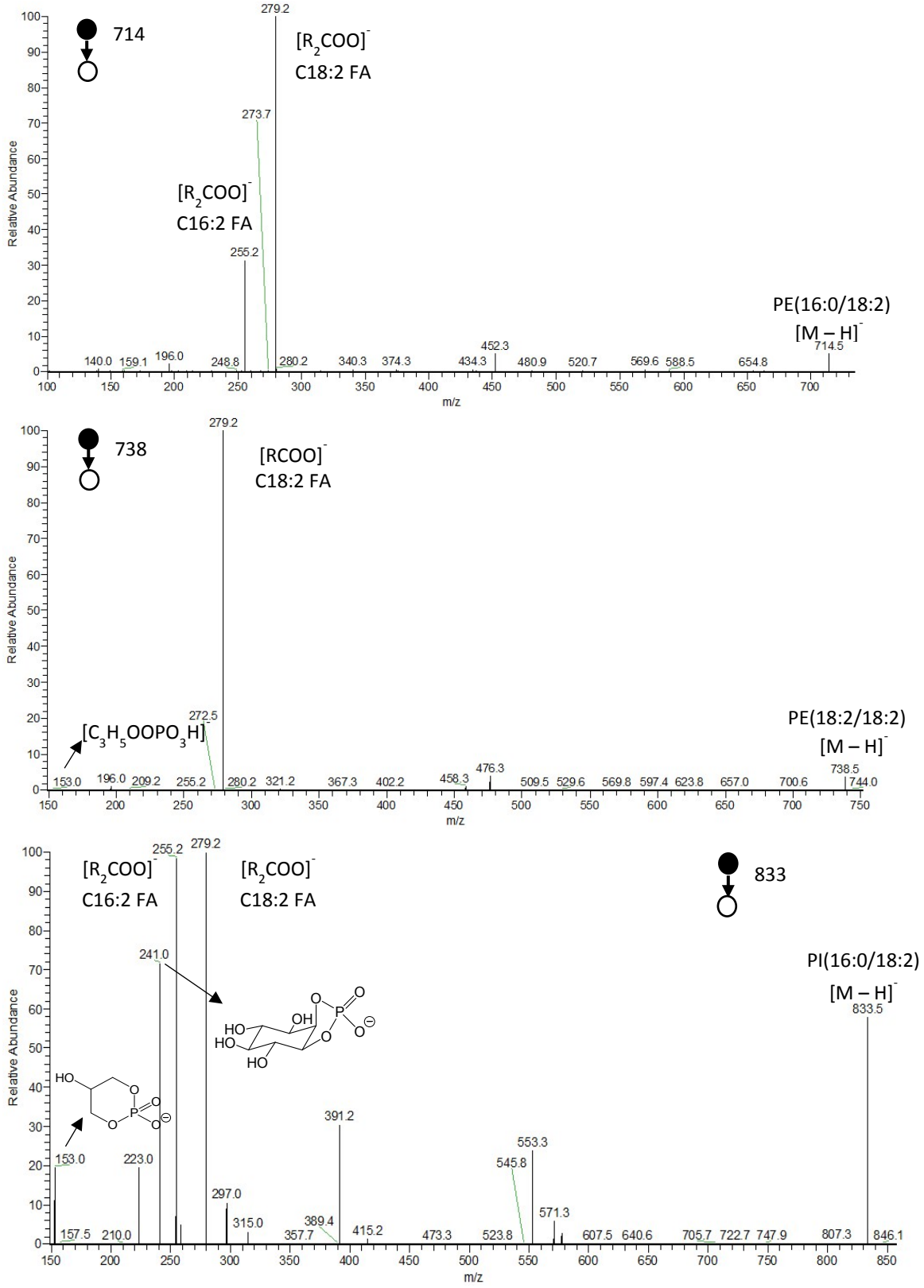


Figure S21. ESI(-)-MS/MS of the metabolites of *m/z* 714, 782, and 833 of *M. perniciosa*.

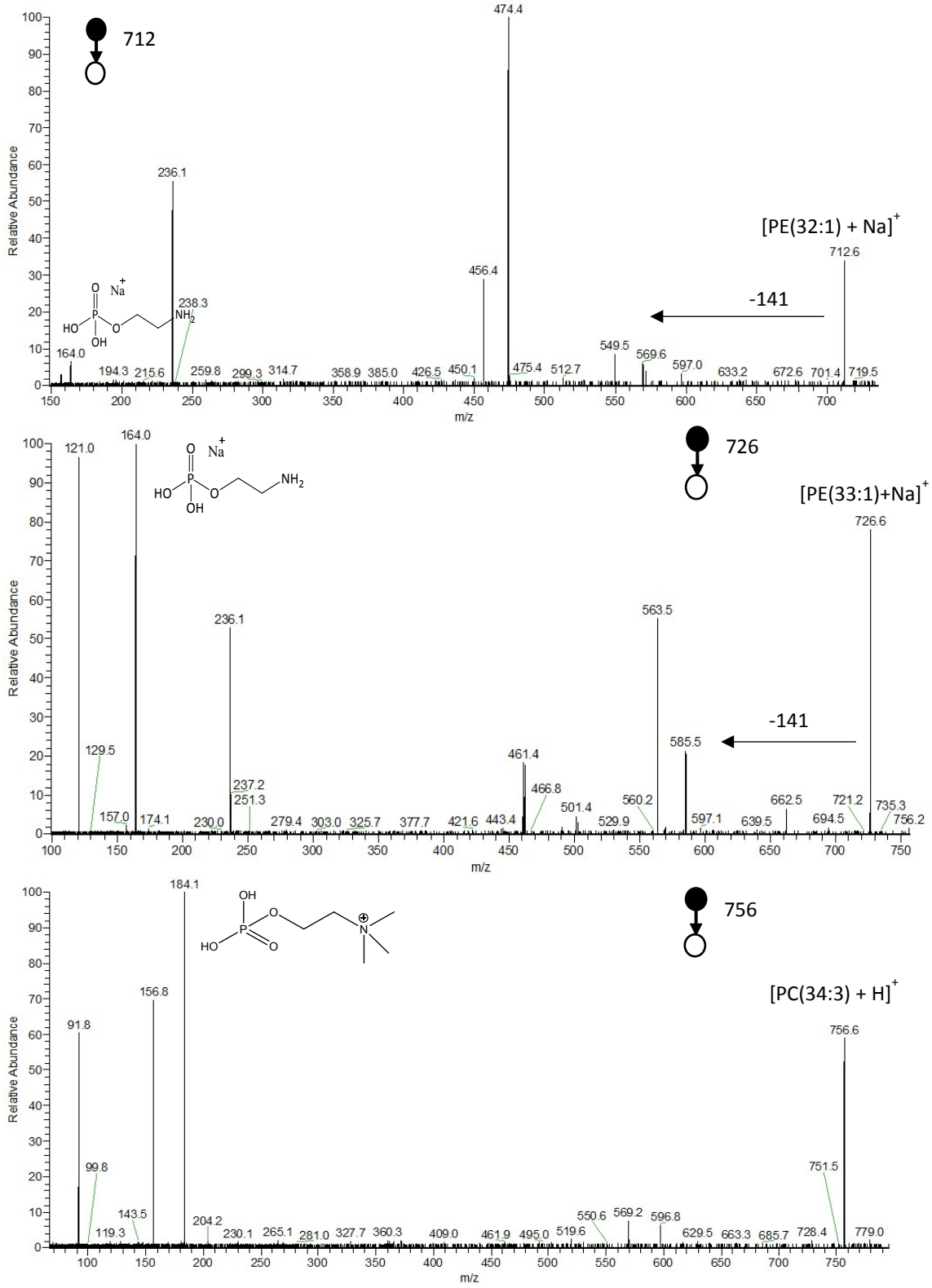


Figure S22. ESI(+)-MS/MS of the metabolites of *m/z* 712, 726, and 756 of *P. citrophthora*.

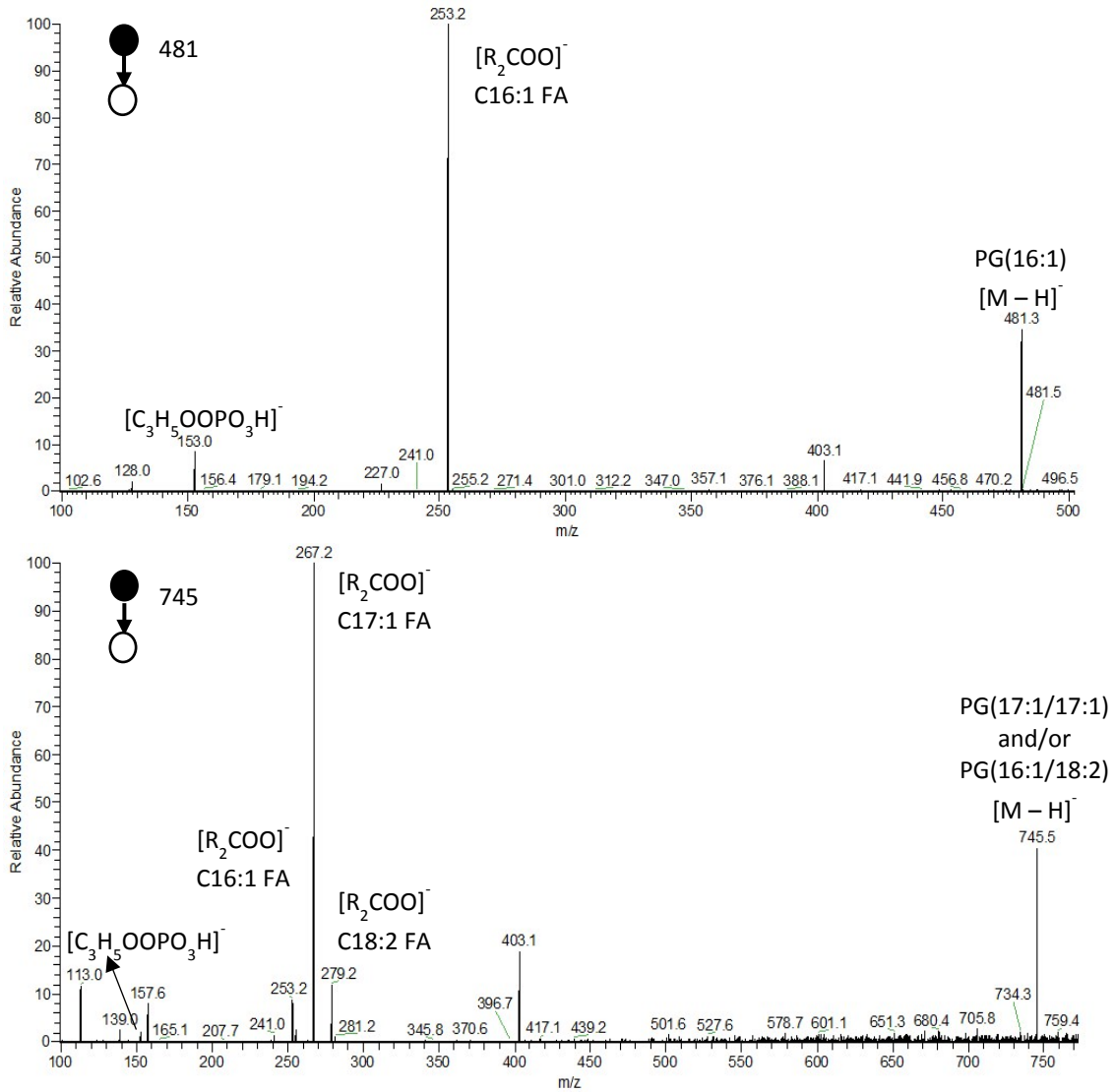


Figure S23. ESI(+)-MS/MS of the metabolite of *m/z* 481 and 745 of *P. citrophthora*.

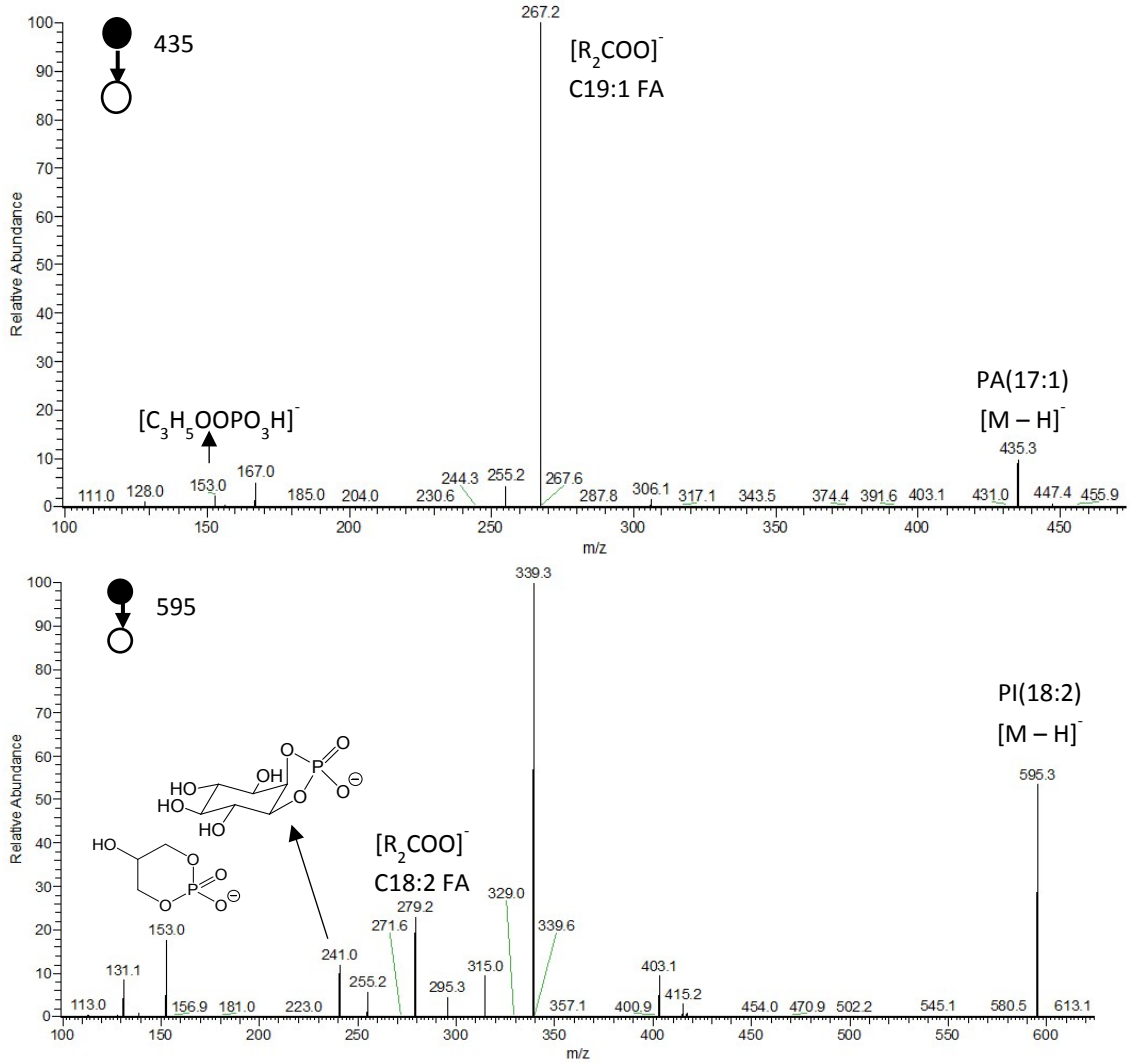


Figure S24. ESI(-)-MS/MS of the metabolites of *m/z* 435 and 595 of *P. citrophthora*.

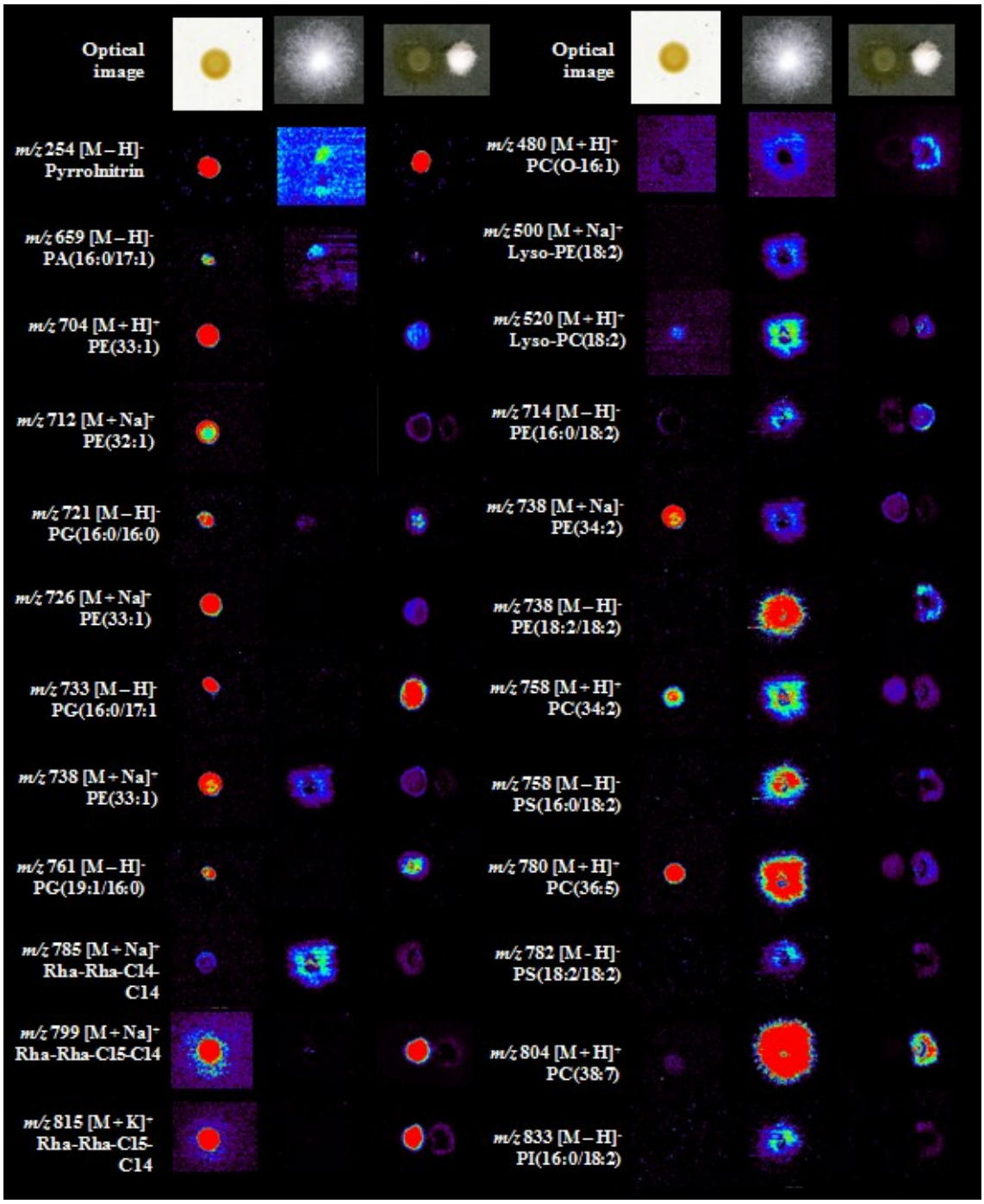


Figure S25. Spatial distributions during coculture of metabolites identified in *B. seminalis* and *M. perniciosa*.

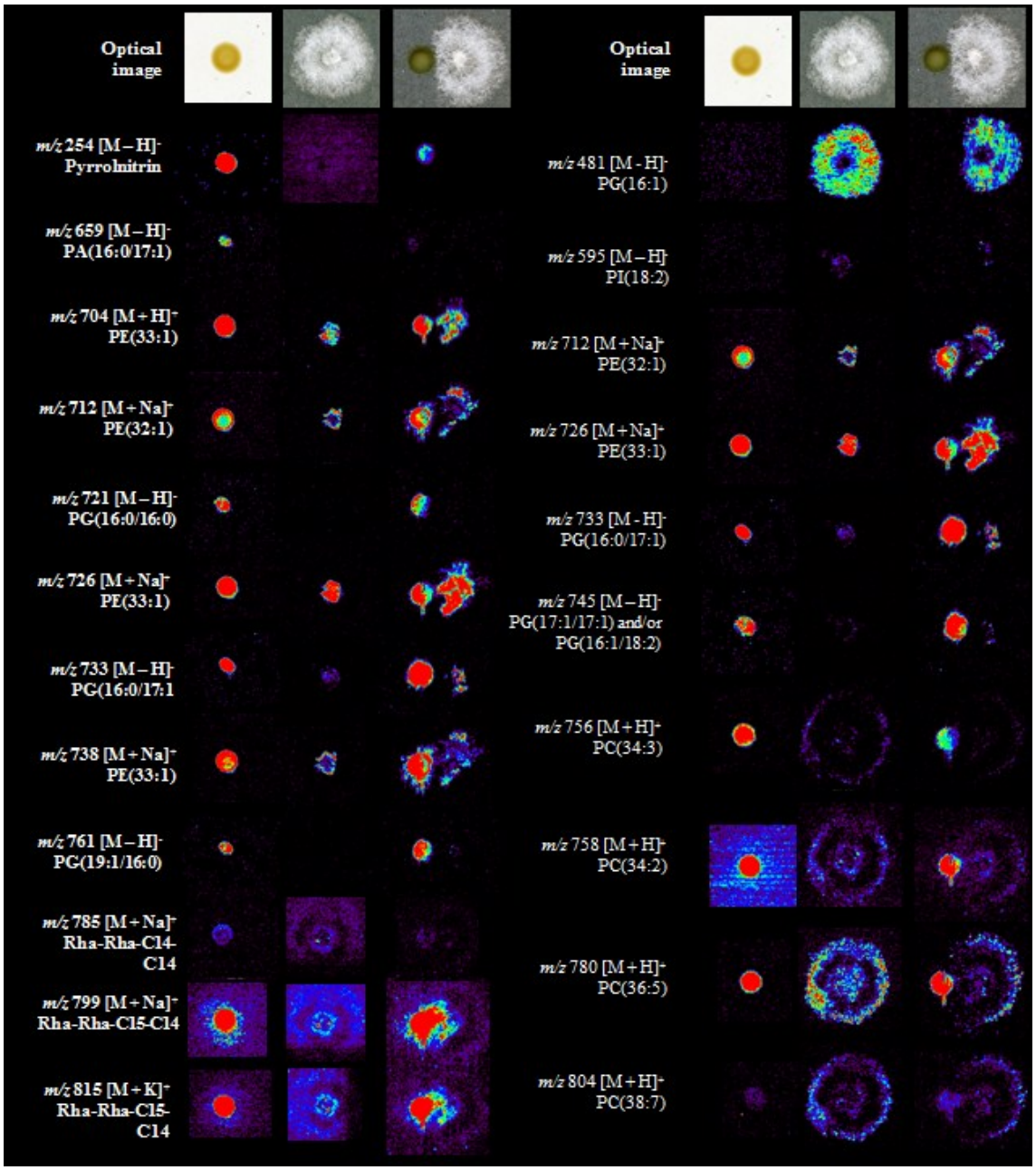


Figure S26. Spatial distributions during coculture of metabolites identified in *B. seminalis* and *P. citrophthora*.

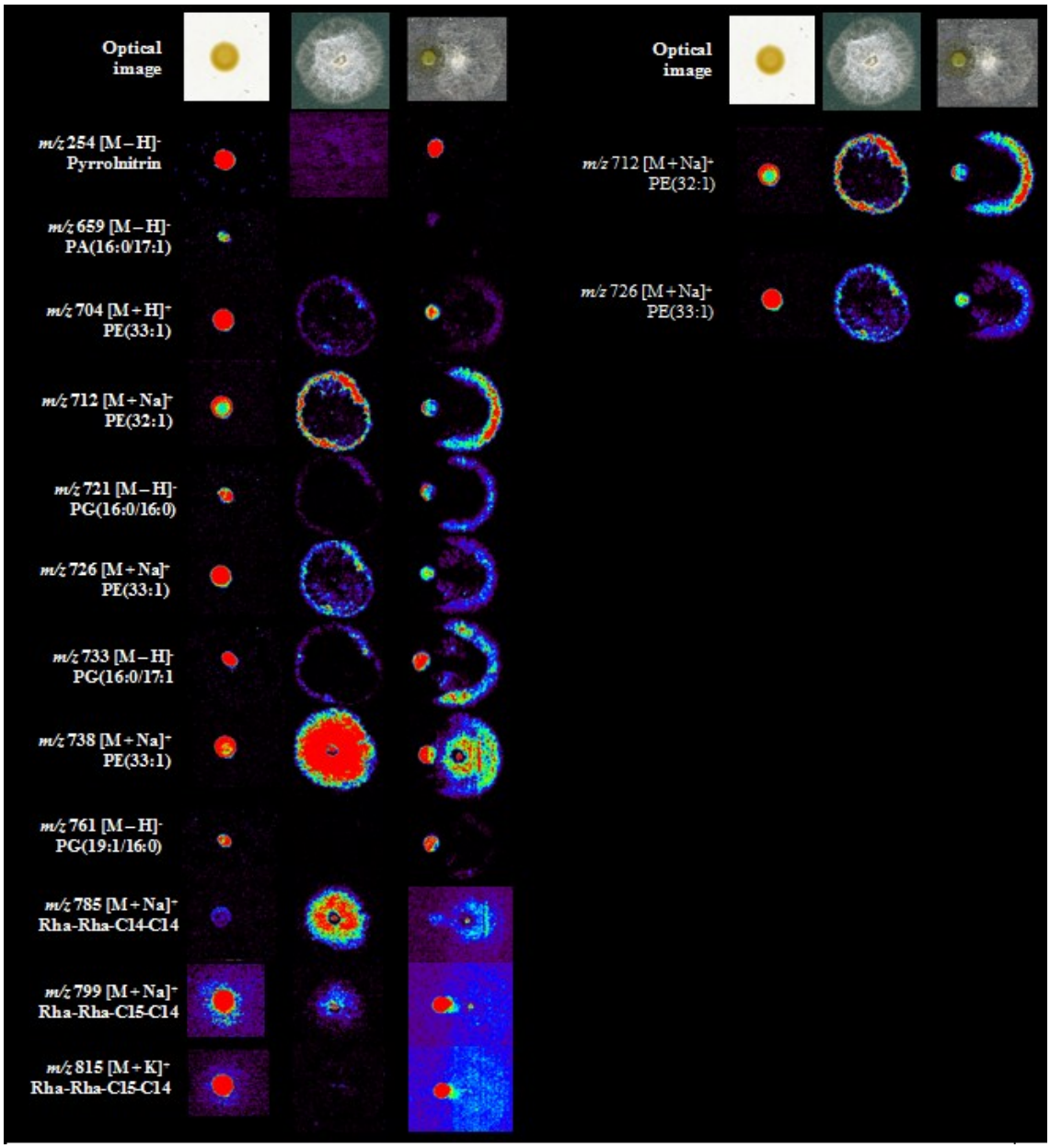


Figure S27. Spatial distributions during coculture of metabolites identified in *B. seminalis* and *P. capsici*.

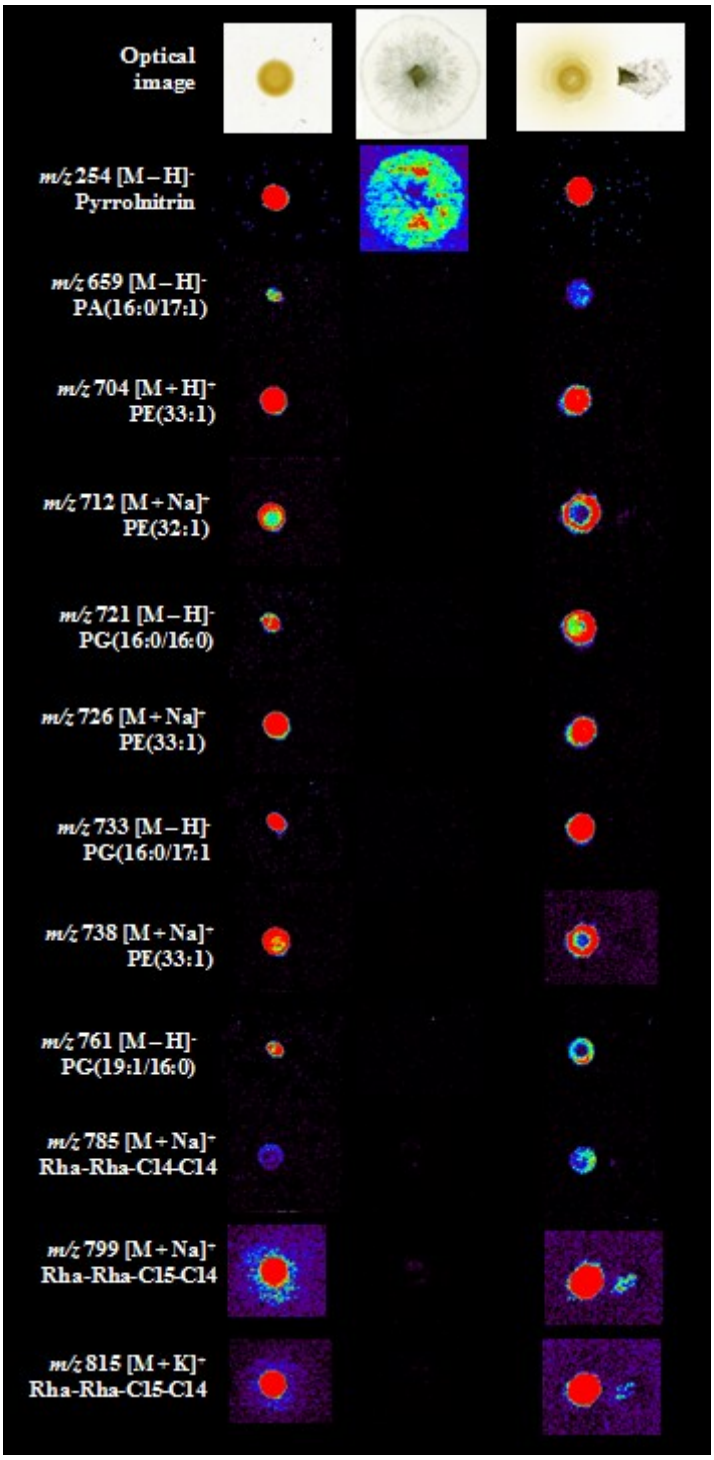


Figure S28. Spatial distributions during coculture of metabolites identified in *B. seminalis* and *P. palmivora*.