



Supplementary Fig. 1. Predicted Biosynthetic gene clusters on *Raoultella ornithinolytica* MG by anti-SMASH.

Avermectin genes	<i>Raoultella ornithinolytica</i>			
	Strain B6	Strain A14	Strain S12	Strain MG
AveBI	Light Blue	Dark Green	White	Light Green
AveBII	White	Light Blue	Light Blue	Light Blue
AveBIII	Grey	Grey	Grey	Grey
AveBIV	Dark Green	Dark Green	Dark Green	Dark Green
AveBV	Light Green	White	Light Green	Light Green
AveBVI	White	White	White	White
AveBVII	White	White	White	White
AveBVIII	Light Green	Light Green	Light Green	Light Green
AveC	White	White	White	White
AveD	Dark Green	Dark Green	White	Dark Green
AveE	White	White	White	White
AveF	Light Green	Light Green	Light Green	Light Green
AveR	White	White	White	White
Orf-1	White	Dark Green	Light Green	Light Green
AveA1	Dark Green	Dark Green	White	Dark Green
AveA2	Dark Green	Dark Green	White	Dark Green
AveA3	Dark Green	Dark Green	White	Dark Green
AveA4	Dark Green	Dark Green	White	Dark Green

**Legend:**

Evalue Range	
Dark Green	>2E-10
Light Green	>1E-51 to 2E-10
Light Blue	>1E-10 to <1E-50
Grey	0.0-1.0

**Supplementary Fig. 2.** Distribution of Avermectin biosynthetic genes on *Raoultella ornithinolytica* Genome.

**Supplementary Table 1.** Predicted homologs of known 42 nematocidal factors (Zheng et al., 2016b) on the genome of *R.ornithinolytica* MG

Entry	Nematicidal factor	Organism	Homolog on <i>R.ornithinolytica</i> MG	
			Protein id	(E-value)
A4K446	Alkaline serine protease	Hirsutella rhossiliensis	-	NA
Q8TFB2	Alkaline serine protease	Metacordyceps chlamydosporia	-	NA
E2IWZ2	Alkaline serine protease P32	Metapochonia rubescens	-	NA
Q68GV9	Alkaline serine protease ver112	Lecanicillium psalliotae	-	NA
Q1M0V3	Cuticle-degrading serine protease	Arthrobotrys conoides	-	NA
G1X8P8	Cuticle-degrading serine protease	Arthrobotrys oligospora	-	NA
C6K2H8	Cuticle-degrading serine protease	Bionectria ochroleuca	-	NA
A1YN98	Cuticle-degrading serine protease	Dactylella shizishanna	-	NA
Q19AS3	Cuticle-degrading serine protease	Dactylella varietas	-	NA
Q1M0V5	Cuticle-degrading serine protease	Monacrosporium cystosporum	-	NA
Q5MB87	Cuticle-degrading serine protease	Arthrobotrys microscaphoides	-	NA
G3FNQ9	Cuticle-degrading serine protease	Arthrobotrys oligospora	-	NA
G3FEJ0	Proteinase	Dactylellina cionopaga	-	NA
A9UGV2	Serine protease	Ophiocordyceps sinensis	-	NA
A9UGV3	Serine protease	Ophiocordyceps sinensis	-	NA
D2KLJ3	Serine protease (Fragment)	Purpureocillium lilacinum	-	NA
A8QMW6	Proteinase T-like protein (Subtilisin-like serine protease)	Purpureocillium lilacinum	-	NA
Q5UKQ4	Alkaline serine protease bace16	Bacillus sp. B16	WP_004857385.1	7.0
Q5UKQ5	Neutral protease bae16	Bacillus sp. B16	WP_004868917.1	2.7
L0AQH5	Metalloproteinase	Bacillus thuringiensis YBT-1518	-	NA
Q069K9	Cuticle-degrading protease	Bacillus sp. RH219	-	NA
Q069K7	Extracellular neutral protease (Fragment)	Bacillus sp. RH219	WP_004868917.1	4.1
Q5XZF9	Extracellular alkaline serine protease	Brevibacillus laterosporus	WP_004857385.1	7.1
Q069K8	Extracellular neutral protease	Brevibacillus laterosporus	WP_004868917.1	2.6
K7WPC5	Metalloproteinase serralysin (Fragment)	Serratia marcescens	-	NA
K7X482	Serine protease (Fragment)	Serratia marcescens	-	NA
Q8WZM5	Trypsin-like protease	Trichoderma harzianum	WP_015585417.1	0.26
Q5MNU2	Basic chitinase	Cordyceps confragosa	WP_004860814.1	3e-27
A9LI60	Chitinase	Bionectria ochroleuca	WP_004860814.1	6e-27
A6Y9S8	Chitinase	Lecanicillium psalliotae	WP_004860814.1	6e-30
B5L0W0	Chitinase	Metacordyceps chlamydosporia	WP_004860814.1	1e-24
A9Q0I9	Chitinase	Purpureocillium lilacinum	WP_004860814.1	6e-27
Q8TF88	Endochitinase class V	Hypocrea virens	WP_004860814.1	5e-28
Q40092	sporamin A	Ipomoea batatas	-	NA
B5LYJ9	Lectin	Remusatia vivipara	-	NA

P00497	Amidophosphoribosyltransferase (ATase)	Bacillus subtilis (strain 168)	WP_015583773.1	2e-104
			WP_015585459.1	8e-16
			WP_004863536.1	2.5
P09229	Cysteine proteinase inhibitor 1	Oryza sativa subsp. japonica (Rice)	-	NA
Q5KCV6	Calcium-transporting ATPase, putative	Cryptococcus neoformans var. neoformans serotype D	WP_004863810.1	2e-159
			WP_004859205.1	2e-140
			WP_015585300.1	4e-43
			WP_015585008.1	8e-17
			WP_015584876.1	5e-13
			WP_004861753.1	4.1
Q5K995	Protein kinase kin1, putative	Cryptococcus neoformans var. neoformans serotype D	WP_004857263.1	0.053
O81137	Root-knot nematode resistance protein	Solanum lycopersicum (Tomato)	-	NA
Q7WZ17	Shiga toxin 1 variant A subunit	Escherichia coli O157:H7	-	NA
K7WRE4	Serrawettin W2 (Fragment)	Serratia marcescens	WP_004862380.1	1e-128

#### E-Value range

	< 0.001
	> 0.01
	> 1