

## **Supporting Information**

Oxidative Stress and Apoptosis of *Geaumannomyces graminis* (*Get*) Induced by Carabrone.

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**Table S1** Primers for fluorescent quantitative PCR

**Table S2** Reaction system of fluorescent quantitative PCR

**Figure S1** HRMS, additive compound of carabrone and L-cysteine

**Figure S2** NMR, additive compound of carabrone and L-cysteine

**Figure S3** Carabronae and GSH

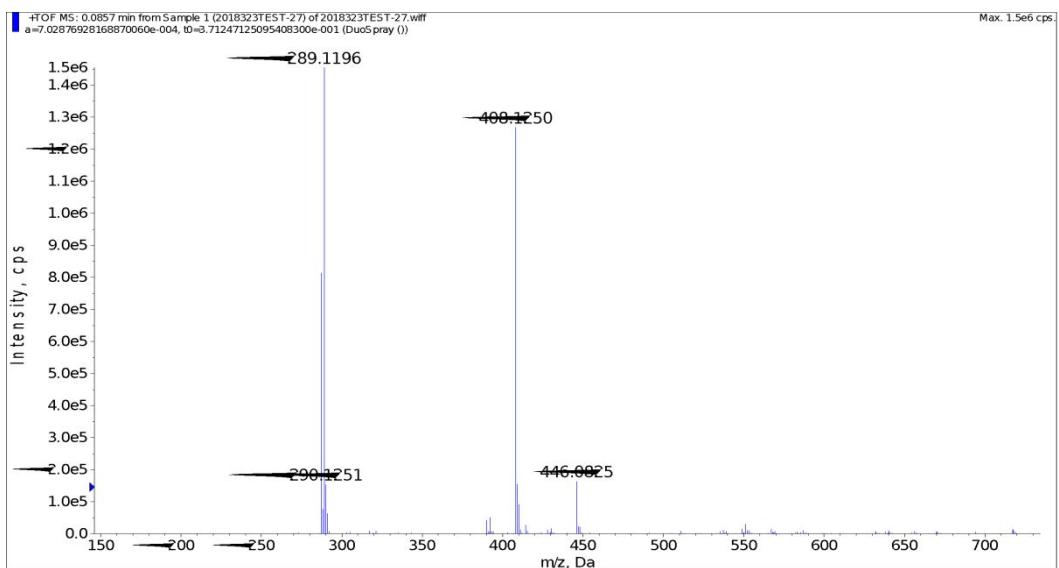
**Table S1** Primers for fluorescent quantitative PCR

Gene name	Gene ID	Sequence (5'-3')	Gene annotation
18S rRNA	U08320	F: CTCTTGETTCTGGCATCG R: GCTGGGCTTGAGTGETG	Housekeeping gene
<i>GgCat3</i>	20340469	F: CGAGGGAAACTTGATATTG R: CTGCGETATCTCATTGTT	CAT in mitochondria
<i>GgZn/CuSod</i>	20351862	F: CTTCCACATCCACACCTT R: TTGATGAGCTTGTCCCTCG	SOD in cell
<i>GgMnSod</i>	20341868	F: CCGTACCGTTGTCGTCCT R: GGCGTTGCCAGTCTTCTT	SOD in mitochondria
<i>GgGr</i>	20351661	F: CTTGTGCCGCTTACTCATTC R: CTCTGGGATTCGGCTGTG	GR in mitochondria
<i>Ggmet1</i>	20342939	F: ACTACTTGETCAGAAGG R: GTAGCCATAGAACTCCTG	Subunit 1 of Melacaspase1
<i>Ggmet2</i>	20345658	F: CCTACCCTACATCTACTC R: CACCATTCATATCACAC	Subunit 2 of Melacaspase1

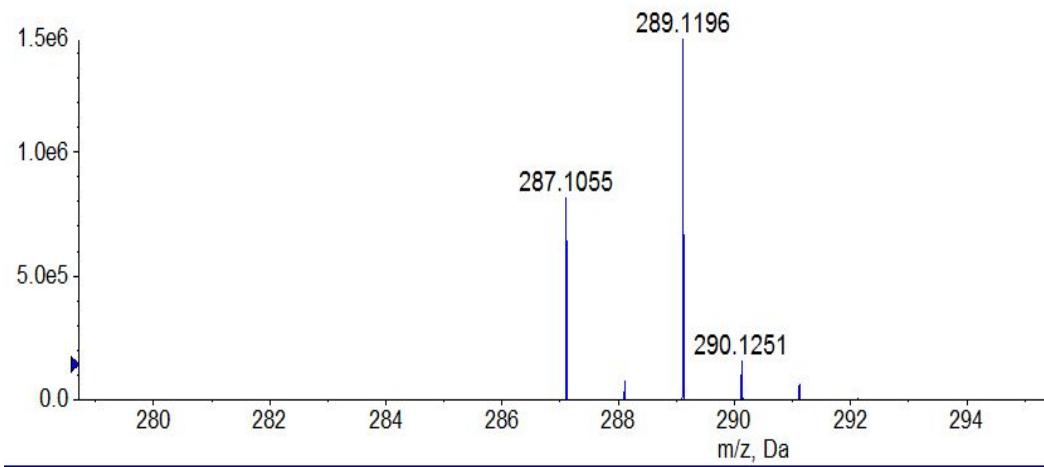
**Table S2 Reaction system of fluorescent quantitative PCR**

Reagents	Volume
SYBR® Premix Ex TaqTM II	5.0
PCR Forward Primer (10 um)	0.3
PCR Reverse Primer (10 um)	0.3
RT reaction solution (cDNA solution)	1.0
Easy dilution (for Real Time)	3.4

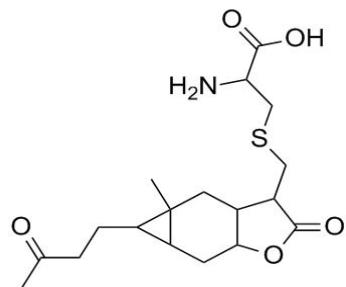
\*\*\*Note: Reaction system was 10  $\mu$ L.



+TOF MS: 0.0857 min from Sample 1 (2018323TEST-27) of 2018323TEST-27.wiff  
 $a=7.02876928168870060e-004$ ,  $t0=3.71247125095408300e-001$  (DuoSpray ())

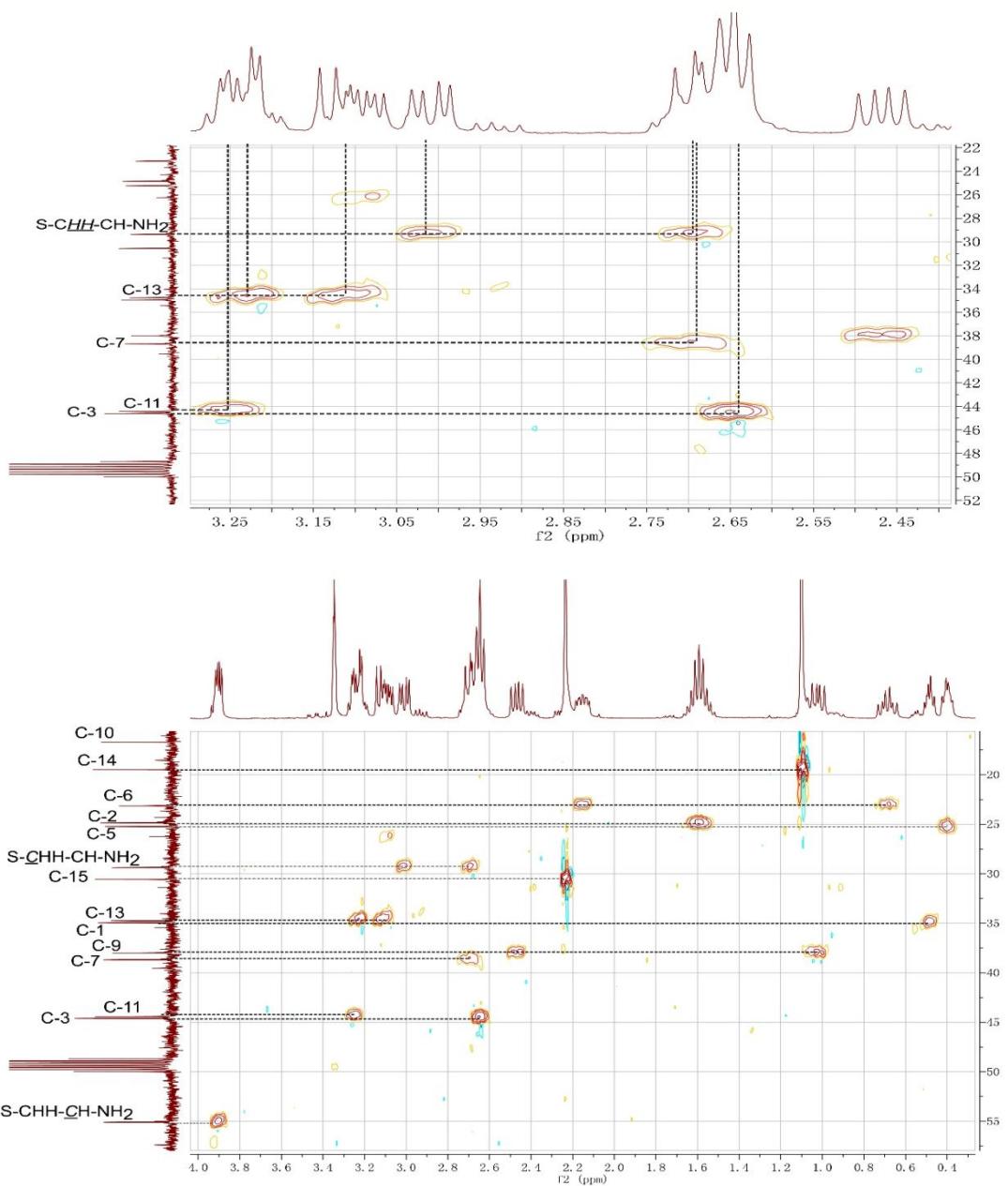


$m/z$  calcd for 287.1050 ( $[M+K]^+$ ), found 287.1055



$m/z$  calcd for 408.1247 ( $[M+K]^+$ ), found 408.1250

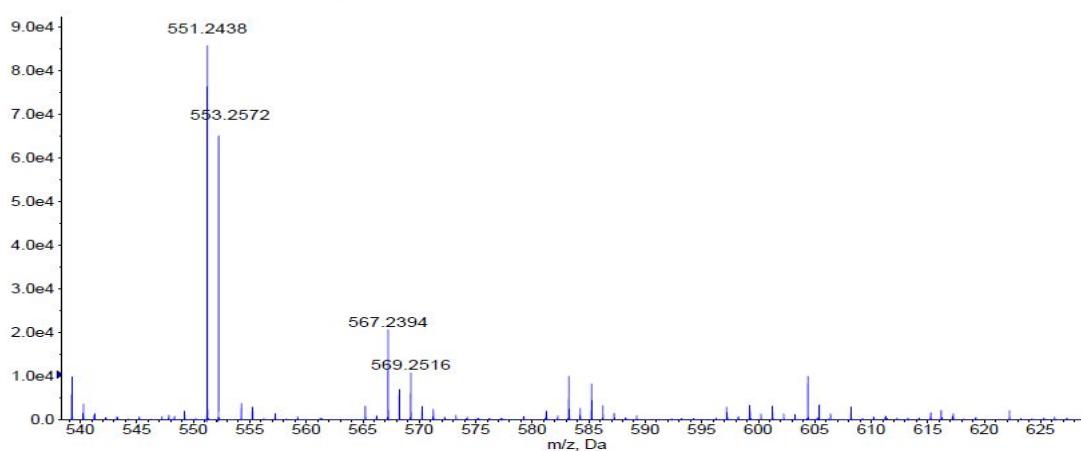
**Figure S1** HRMS, additive compound of carabrone and L-cysteine



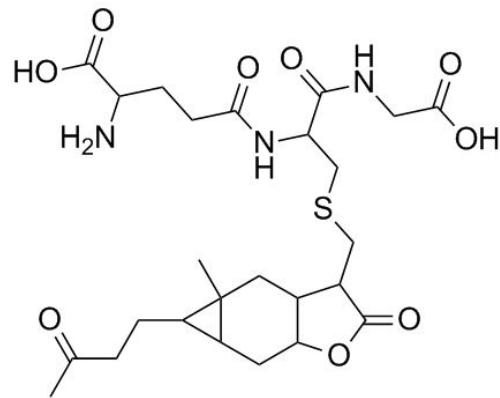
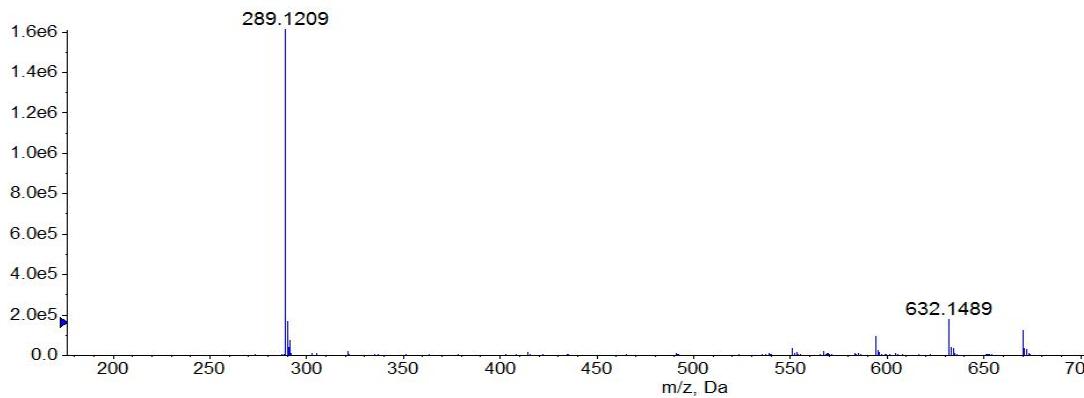
**Figure S2** NMR, additive compound of carabrone and L-cysteine

+TOF MS: 0.1029 min from Sample 1 (2018323TEST-28) of 2018323TEST-28.wiff  
a=7.02877741656301770e-004, t0=4.39046918452309200e-001 (DuoSpray (I))

Max. 1.0e8



+TOF MS: 0.1029 min from Sample 1 (2018323TEST-28) of 2018323TEST-28.wiff  
a=7.02877741656301770e-004, t0=4.39046918452309200e-001 (DuoSpray (I))



m/z calcd for 556.2329 ([M+H]<sup>+</sup>), 578.2148 ([M+Na]<sup>+</sup>), 594.1888([M+K]<sup>+</sup>); not found

**Figure S3** Carabronae and GSH