

Supplementary Information

Phytotoxicity and Anti-Phytopathogenic Activities of Marine-Derived Fungi and Their Secondary Metabolites

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Table S1. Identification and phylogenetic affiliations of the isolated marine-derived fungal strains.

Strain	Closest identified relative	Accession number	Similarity (%)	Seq.Length (bp)	Overlap (bp)
D1	<i>Penicillium oxalicum</i>	MF961796	100%	565	565
D2	<i>Penicillium sclerotiorum</i>	MG827186	100%	552	552
D3	<i>Fusarium solani</i>	MG827183	100%	534	534
D4	<i>Paraconiothyrium brasiliense</i>	MG827175	99%	583	581
D5	<i>Aspergillus versicolor</i>	MG827180	99%	564	555
D6	<i>Paecilomyces formosus</i>	MG827161	99%	616	605
D7	<i>Poitrasia circinans</i>	MG827156	100%	633	603
D8	<i>Paracamarosporium hawaiiense</i>	MG827189	99%	562	549
D9	<i>Pestalotiopsis microspora</i>	MG827171	100%	521	521
D10	<i>Talaromyces ohiensis</i>	MG827176	99%	569	564
D11	<i>Phoma</i> sp.	MG827157	100%	505	502
D12	<i>Trichoderma hamatum</i>	MG827166	98%	666	653
D13	<i>Trichoderma harzianum</i>	MG827165	100%	590	590
D14	<i>Trichoderma asperellum</i>	MG827162	100%	581	581
D15	<i>Talaromyces flavus</i>	MG827177	99%	553	553
D16	<i>Phomopsis</i> sp.	MG827160	99%	548	548
D17	<i>Aspergillus fumigatus</i>	MG827158	100%	571	571
D18	<i>Colletotrichum siamense</i>	MF961799	99%	544	544
D19	<i>Trichoderma virens</i>	MG827167	99%	602	601
D20	<i>Aspergillus</i> sp.	MF961797	100%	577	577
D21	<i>Talaromyces allahabadensis</i>	MG827185	100%	546	526
D22	<i>Lasiodiplodia theobromae</i>	MF961794	100%	516	516
D23	<i>Neofusicoccum mangiferae</i>	MF961790	100%	558	558
D24	<i>Sarocladium kiliense</i>	MG827178	100%	548	548
D25	<i>Fusarium</i> sp.	MG827190	99%	694	566
D26	<i>Penicillium oxalicum</i>	MF961791	99%	558	558
D27	<i>Fusarium solani</i>	MG827169	100%	536	536
D28	<i>Pleosporales</i> sp.	MG827187	97%	520	517
D29	<i>Paecilomyces</i> sp.	MG827159	99%	613	605
D30	<i>Pestalotiopsis</i> sp.	MG827173	99%	585	584
D31	<i>Penicillium</i> sp.	MG827172	99%	591	584
D32	<i>Paracamarosporium hawaiiense</i>	MG827181	99%	554	546
D33	<i>Penicillium citrinum</i>	MF961792	99%	537	532
D34	<i>Clonostachys rosea</i>	MG827170	99%	540	540
D35	<i>Talaromyces columbinus</i>	MG827174	100%	561	561
D36	<i>Volutella</i> sp.	MG827191	98%	564	557
D37	<i>Pleosporales</i> sp.	MG827179	99%	529	528

Table S2. Antifungal activity against spore germination of the marine-derived fungal extracts (10.0 mg/mL).

Strains	<i>A. alternata</i>	<i>A. brassicicola</i>	<i>A. niger</i>	<i>P. theae</i>
D1	+	+++	-	-
D2	-	+	-	-
D5	-	+	-	-
D9	+	-	-	-
D12	+	+++	+++	-
D14	+	+	+++	+
D21	+	++	-	-
D26	-	+++	-	-
D27	+++	+++	+++	-

- no antifungal activity; + weak antifungal activity (5 mm < inhibition zone < 10 mm); ++ moderate antifungal activity (10 mm < inhibition zone < 15 mm); +++ strong antifungal activity (inhibition zone > 15 mm).

Table S3. Antifungal activity against mycelial growth (10.0 mg/mL) of plant pathogenic fungi.

Strains	<i>A. alternata</i>	<i>A. brassicicola</i>	<i>D. medusaea</i>	<i>P. theae</i>
D1	-	+++	++	-
D2	-	-	+	+
D5	-	++	-	-
D12	-	-	++	++
D13	-	-	+	-
D14	-	-	+	++
D21	+	-	+	-
D26	-	+	-	-
D27	-	-	++	-
P8	-	+	+	-

- no obvious antifungal activity (inhibition rate <50%); + weak antifungal activity (50% < inhibition rate <70%); ++ moderate antifungal activity (70% < inhibition rate <90%); +++ strong antifungal activity (inhibition rate > 90%).

Table S4. Antibacterial activity of the marine-derived fungal extracts.

Strains	Concentration (10.0 mg/mL)			Concentration (1.0	
	<i>A. avenae</i>	<i>P. syringae</i>	<i>R. solanacearum</i>	<i>A. avenae</i>	<i>P. syringae</i>
D1	+++	+++	-	++	+++
D2	-	+	-	-	-
D7	+	-	-	-	-
D9	-	++	-	-	-
D12	-	+	++	-	-
D13	-	-	++	-	-
D14	-	+	+++	-	-
D19	-	++	-	-	-
D20	+	+	-	-	-
D21	+++	+++	-	+++	+++
D22	+	-	-	-	-
D26	-	+++	-	-	+++
D34	-	++	-	-	-
D35	-	+	-	-	-

- no antibacterial activity; + weak inhibitory activity (inhibition zone between 5 mm and 10 mm); ++ moderate inhibitory activity (inhibition zone between 10 mm and 15 mm); +++ strong inhibitory activity (inhibition zone > 15 mm).

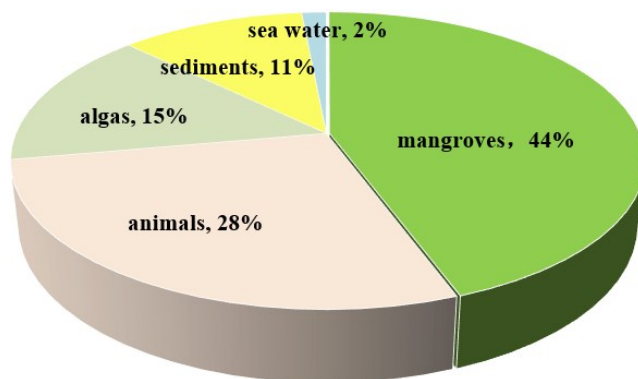


Figure S1. The sources of the isolate marine-derived fungal strains

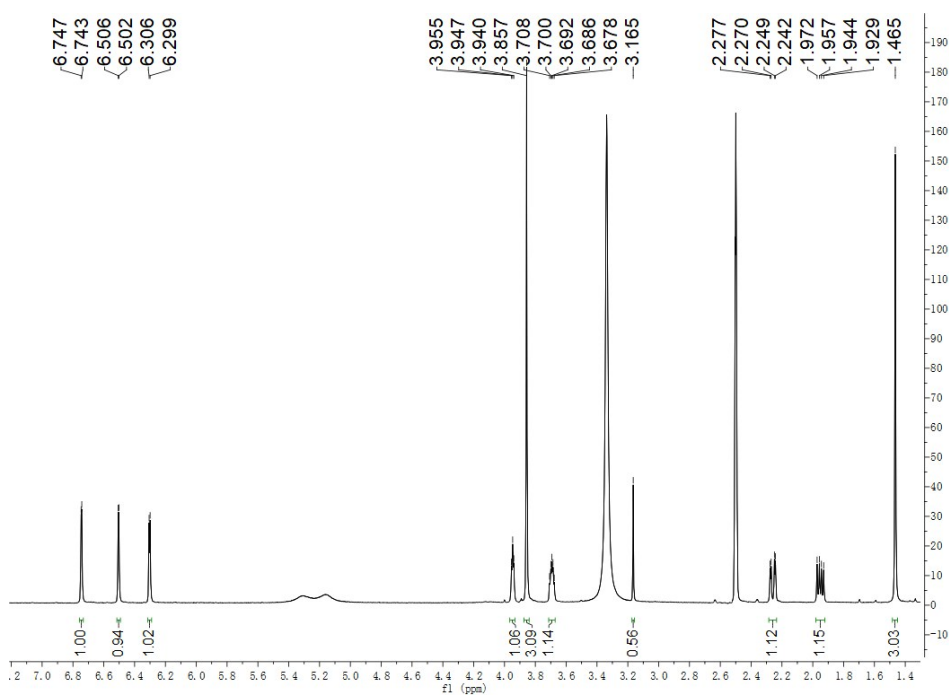


Figure S2. ¹H NMR (500 MHz, DMSO-*d*₆) spectrum of compound **1**

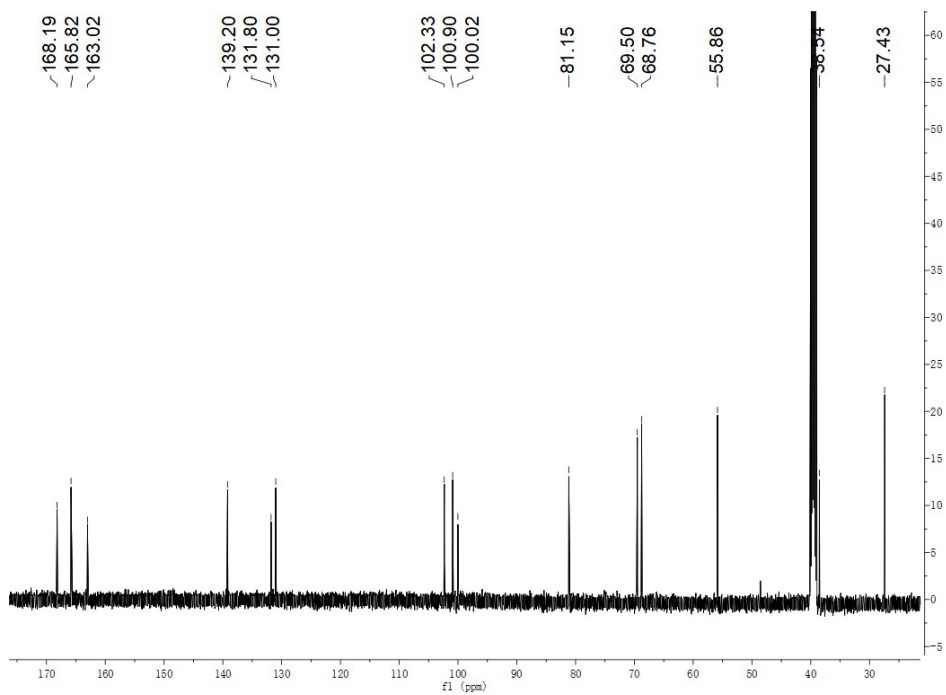


Figure S3. ^{13}C NMR (125 MHz, $\text{DMSO-}d_6$) spectrum of compound **1**

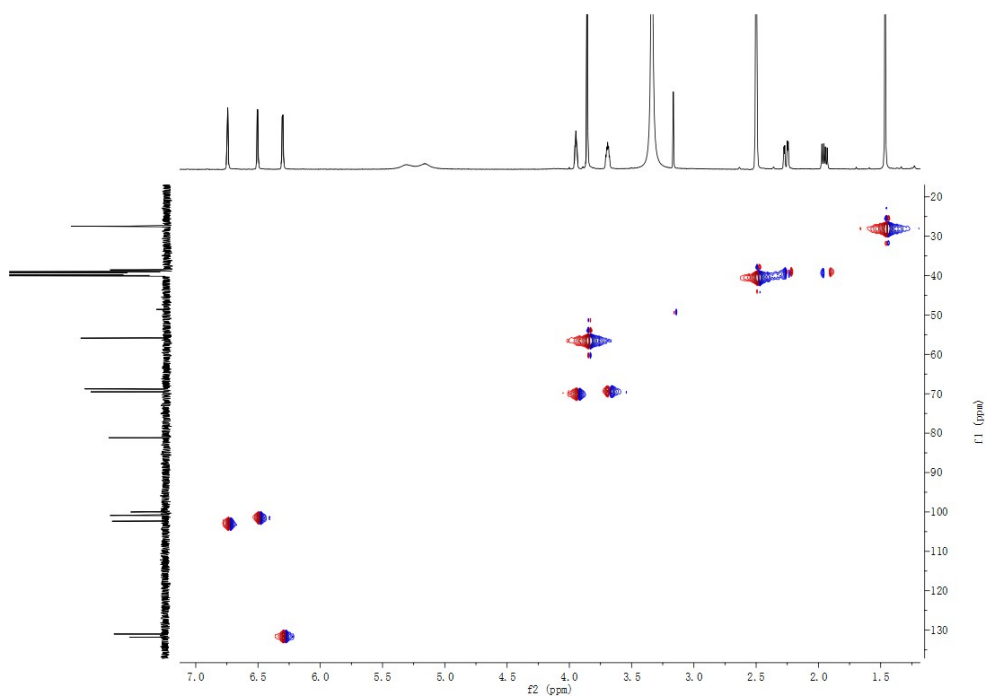


Figure S4. HMBC ($\text{DMSO-}d_6$) spectrum of compound **1**

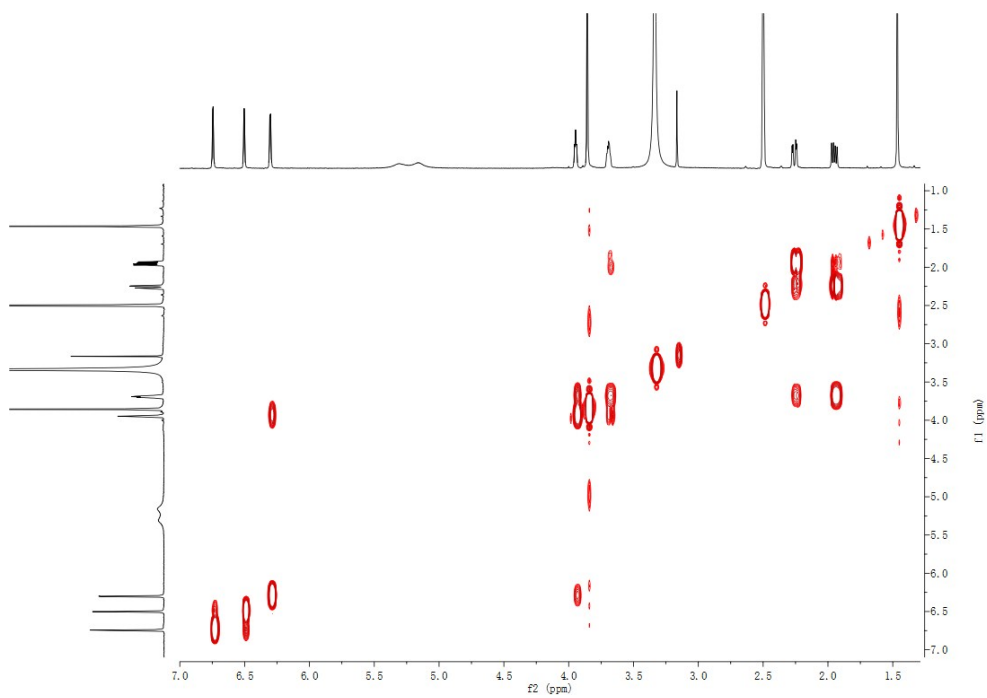


Figure S5. COSY (DMSO-*d*₆) spectrum of compound **1**

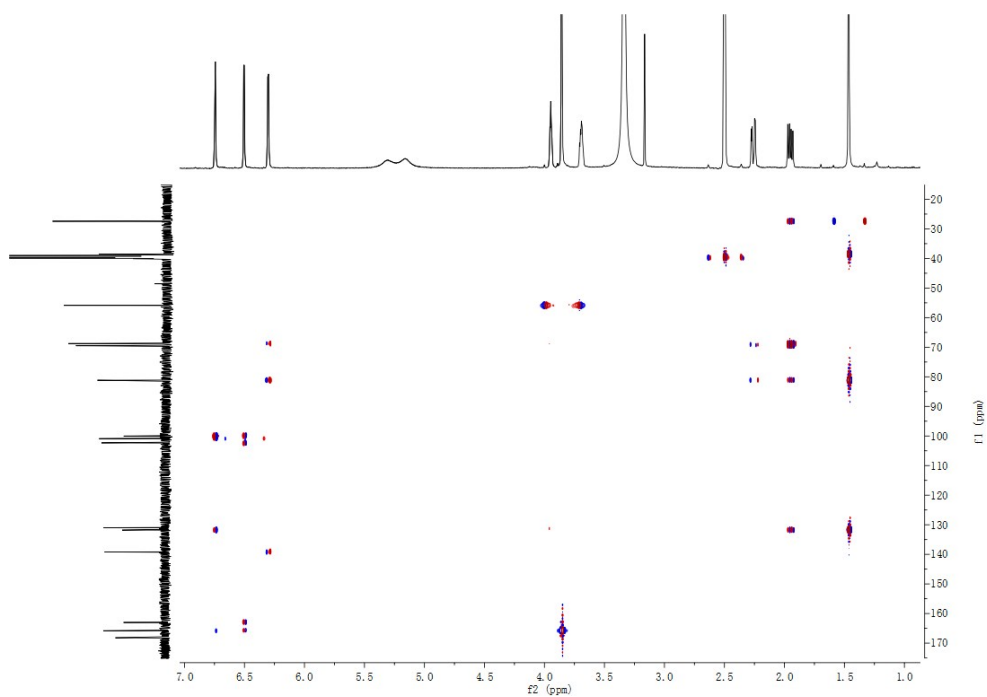


Figure S6. HMBC (DMSO-*d*₆) spectrum of compound **1**

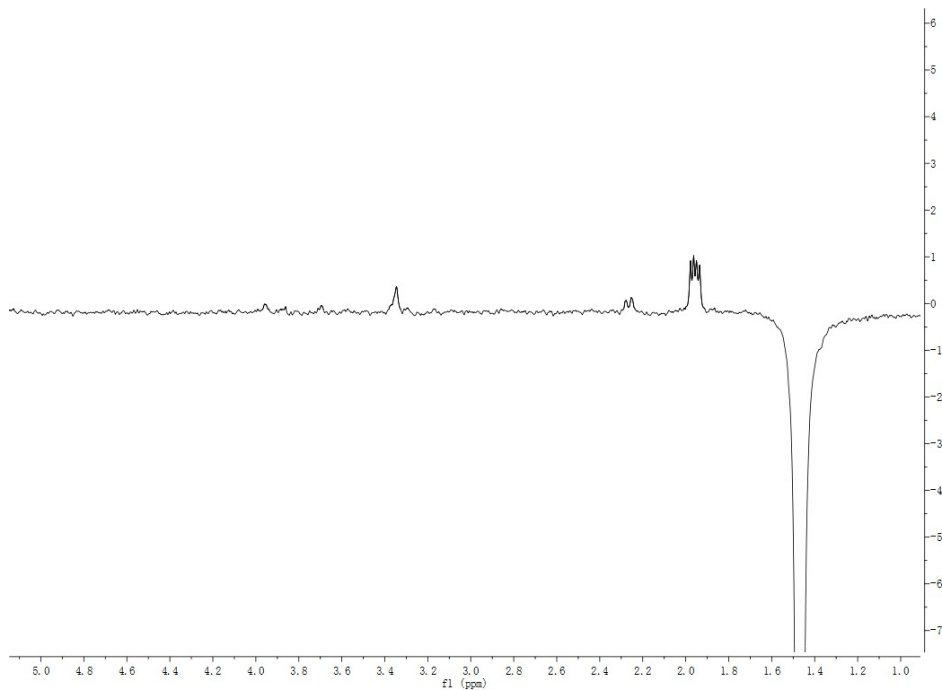


Figure S7. 1D NOE (DMSO- d_6) spectrum of compound **1**

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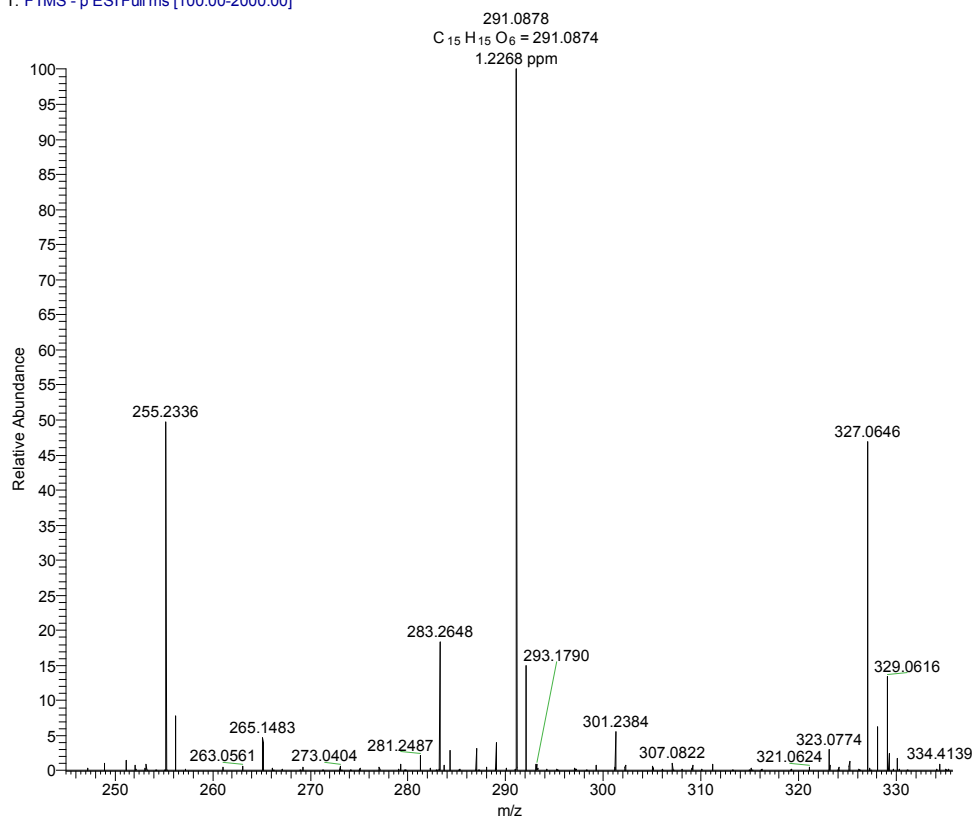


Figure S8. HRESIMS spectrum of compound **1**