

Table S1. GenBank accession numbers for additional sequenced isolates of entomopathogenic fungi infecting *L. delicatula*.

Fungal species	Isolate	ITS	LSU	RPB1	RPB2	TEF 1- α
<i>Akanthomyces muscarius</i>	27-Jul-AFF4a	OR582987	OR577036	OR602845		OR602796
<i>Akanthomyces muscarius</i>	27-Jul-AFF5a	OR582988	OR577037			OR672128
<i>Akanthomyces muscarius</i>	2-Nov-GR29b	OR582989 ¹	OR577038	OR602846	OR602850	OR602797
<i>Akanthomyces muscarius</i>	7-Sep-AFF-FC10	OR582990 ¹	OR577039	OR602847	OR602851	OR602798
<i>Akanthomyces muscarius</i>	23-Sep-GR-FC1	OR582986		OR602844		OR672129
<i>Akanthomyces muscarius</i>	12-Oct-AFF-FC5	OR582985 ¹	OR577035	OR602843	OR602849	OR602795
<i>Clonostachys rosea</i>	20-Jul-GR7a	OR582992 ¹				OR602800
<i>Clonostachys rosea</i>	27-Jul-GR5a	OR582993 ¹				OR602801
<i>Cordyceps javanica</i>	SS-L3-14F	OR583014				OR672130
<i>Fusarium avenaceum</i>	22-Jun-CCC2b	OR582997 ¹				OR602805
<i>Fusarium avenaceum</i>	13-Jul-F2	OR582995 ¹				OR602803
<i>Fusarium avenaceum</i>	20-Jul-AFF4	OR582996				OR602804
<i>Fusarium concentricum</i>	8-Jun-F1					OR602808
<i>Fusarium concentricum</i>	3-Aug-AFF7					OR602807
<i>Fusarium concentricum</i>	23-Sep-CCC10	OR582998				OR602806
<i>Fusarium falsibabinda</i>	5-Oct-GR18					OR602812
<i>Fusarium falsibabinda</i>	2-Nov-F23	OR582999 ¹				OR602809
<i>Fusarium falsibabinda</i>	2-Nov-F31	OR583000				OR602810
<i>Fusarium falsibabinda</i>	2-Nov-GR-FC16	OR583001				OR602811
<i>Fusarium fujikuroi</i>	13-Jul-F1				OR602853	OR602816
<i>Fusarium fujikuroi</i>	27-Jul-AFF9a	OR583004			OR602854	OR602824
<i>Fusarium fujikuroi</i>	27-Jul-F1				OR602855	OR602826
<i>Fusarium fujikuroi</i>	3-Aug-AFF4					OR602828
<i>Fusarium fujikuroi</i>	3-Aug-GR12					OR602829
<i>Fusarium fujikuroi</i>	10-Aug-GR2					OR602814
<i>Fusarium fujikuroi</i>	10-Aug-GR9					OR602815

<i>Fusarium fujikuroi</i>	10-Aug-GR12			OR602813
<i>Fusarium fujikuroi</i>	24-Aug-AFF3	OR583003		OR602819
<i>Fusarium fujikuroi</i>	24-Aug-GR2			OR602821
<i>Fusarium fujikuroi</i>	24-Aug-GR15			OR602820
<i>Fusarium fujikuroi</i>	24-Aug-GR22			OR602822
<i>Fusarium fujikuroi</i>	24-Aug-GR25			OR602823
<i>Fusarium fujikuroi</i>	7-Sep-GR7			OR602837
<i>Fusarium fujikuroi</i>	7-Sep-GR22	OR583008		OR602836
<i>Fusarium fujikuroi</i>	7-Sep-CCC1			OR602833
<i>Fusarium fujikuroi</i>	7-Sep-CCC13			OR602834
<i>Fusarium fujikuroi</i>	7-Sep-CCC15W	OR583007		OR602835
<i>Fusarium fujikuroi</i>	23-Sep-GR27			OR602818
<i>Fusarium fujikuroi</i>	23-Sep-F24	OR583002		OR602817
<i>Fusarium fujikuroi</i>	5-Oct-GR10	OR583006		OR602830
<i>Fusarium fujikuroi</i>	5-Oct-GR15			OR602831
<i>Fusarium fujikuroi</i>	5-Oct-GR16			OR602832
<i>Fusarium fujikuroi</i>	O-L4-2	OR583018		OR602842
<i>Fusarium fujikuroi</i>	27-Jul-AFF-FC3			OR602825
<i>Fusarium fujikuroi</i>	29-Sep-AFF-FC19Y	OR583005		OR602827
<i>Fusarium graminearum</i>	5-Oct-AFF31	OR583011 ¹	OR602857	OR602840
<i>Fusarium graminearum</i>	5-Oct-AFF33	OR583012 ¹	OR602858	OR602841
<i>Fusarium graminearum</i>	2-Nov-GR15	OR583010	OR602856	OR602839
<i>Fusarium graminearum</i>	2-Nov-CCC22	OR583009		OR602838
<i>Sarocladium strictum</i>	27-Jul-F3	OR583013 ¹		OR672133
<i>Trichothecium roseum</i>	AFF-L3-4C	OR583016		OR672135

¹ Isolates which were amplified and sequenced with ITS1 (mod) for the forward primer.

Table S2. Methods used for challenging *L. delicatula* to confirm pathogenicity of fungal species.

Fungal species	Conditions promoting conidial production				Conidial concentration (conidia/ml)	Instars tested	Testing results ¹
	Media	Parafilm	Light	Temperature (°C)			
<i>Akanthomyces muscarius</i>	PDA	Yes	Dark	23	6.7×10^7	A3	Visual ID
<i>Clonostachys eriocamporesii</i>	1/3 PDA	No	12:12 light	28	1×10^7	A2	KP
<i>Clonostachys rosea</i>	PDA	Yes	Dark	24	1×10^7	1–2	KP
<i>Colletotrichum fioriniae</i>	PDA	Yes	Dark	24	1×10^7	A2	KP
<i>Cordyceps cateniannulata</i>	PDA	Yes	Dark	26	7.4×10^6	A3	Visual ID
<i>Cordyceps javanica</i>	PDA	Yes	Dark	24	1×10^7	A3	KP
<i>Flavocillium bifurcatum</i>	PDA	Yes	Dark	24	1×10^7	A2	KP
<i>Fusarium avenaceum</i>	PDA	No	12:12 UV	24	1×10^7	A1	KP
<i>Fusarium concentricum</i>	PDA	Yes	Dark	24	1×10^7	4	KP
<i>Fusarium falsibabinda</i>	PDA	Yes	Dark	23	3.5×10^7	A3	Visual ID
<i>Fusarium fujikuroi</i>	PDA	Yes	Dark	24	1×10^7	2–3	KP
<i>Fusarium graminearum</i>	PDA	No	12:12 UV	24	1×10^7	A1	KP
<i>Samsoniella</i> sp.	PDA	Yes	Dark	24	1×10^7	4	KP
<i>Sarocladium strictum</i>	PDA	Yes	Dark	24	1×10^7	4	KP
<i>Trichothecium roseum</i>	SDA	Yes	Dark	24	1×10^7	A2	KP

¹ KP = Koch's postulates (reisolation from cadaver and ID); Visual ID = in 2021, we did not reisolate from infected insects but visually checked fungal outgrowth and conidia from cadavers.