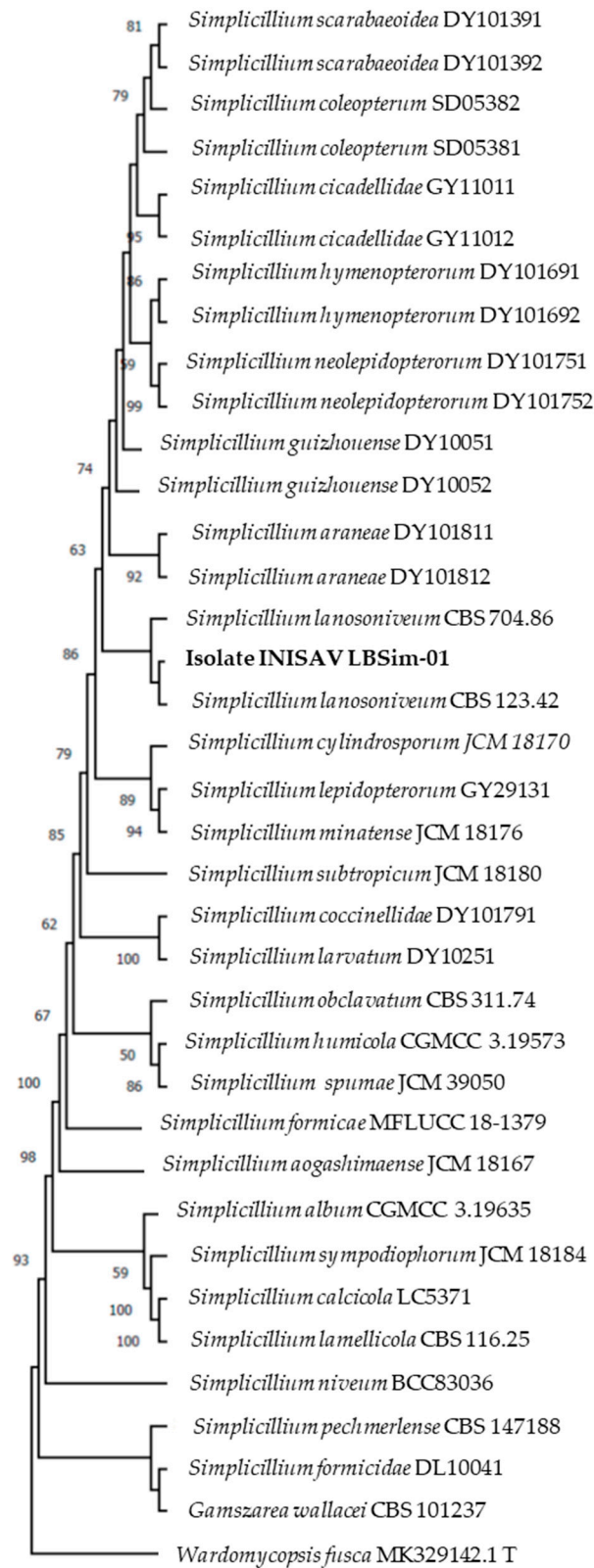
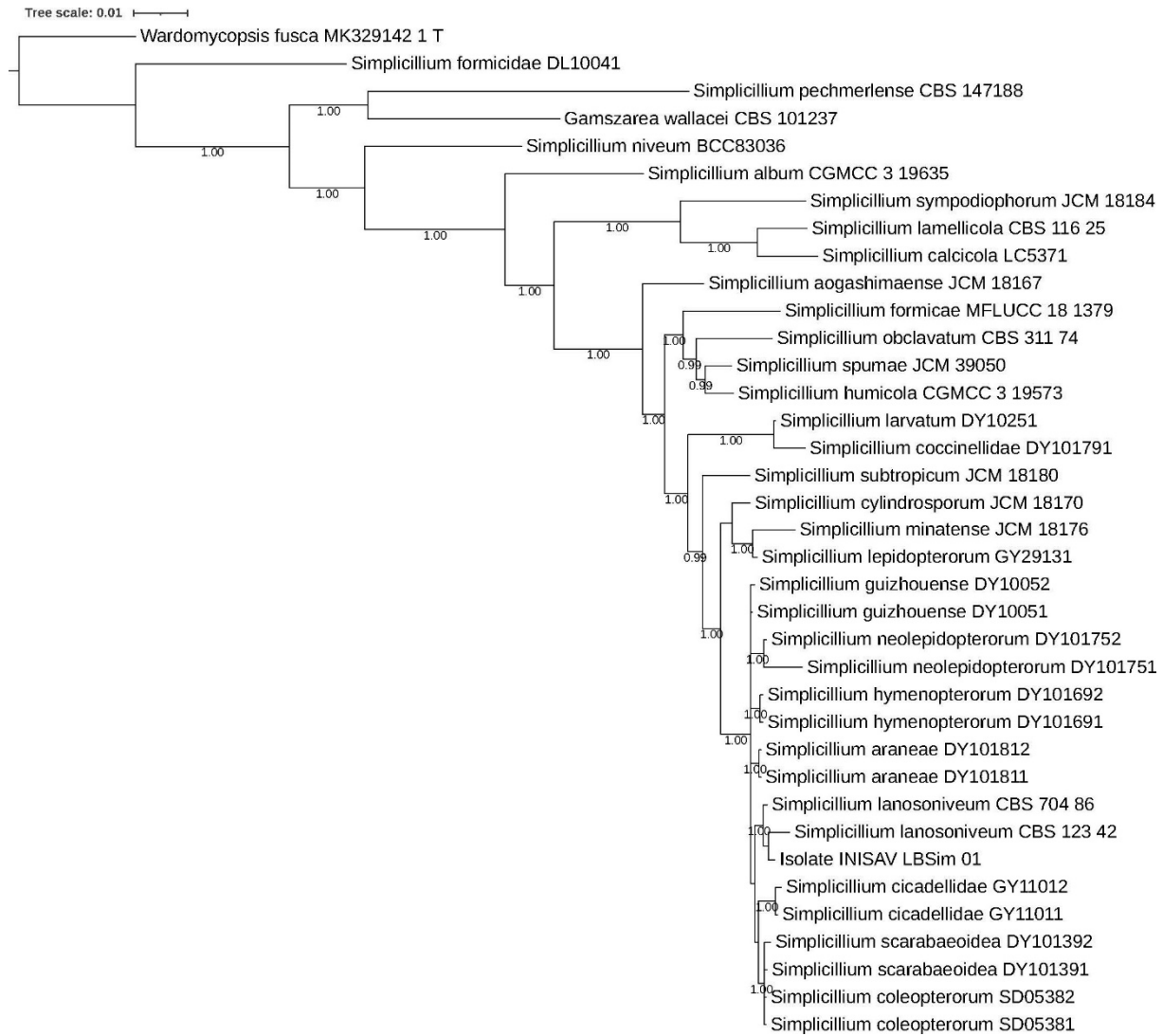


Supplementary:



Supplementary Figure. S1. Phylogenetic relationships of isolate LBSim-01 with related taxa derived from maximum-likelihood (ML) analysis using the concatenated sequences of ITS, LSU and EF1A with *Wardomyces fusca* as the outgroup. RA×ML bootstrap support values (ML ≥ 70) were shown at the nodes. Bar = 0.02 substitutions per nucleotide position.



Supplementary Figure. S2. Phylogenetic relationships of isolate LBSim-01 with related taxa derived from Bayesian posterior probability analysis using the concatenated sequences of ITS, LSU and EF1A with *Wardomycesopsis fusca* as the outgroup. Bayesian posterior probability values (PP \geq 0.90) were shown at the nodes. Bar = 0.02 substitutions per nucleotide position.

Supplementary Table. S1. Reference data sets of fungal strains and marker sequences used for phylogenetic analysis.

Genus, Species, Strain Designations	ITS	LSU	EF1A
<i>Simplicillium aogashimaense</i> _JCM_18167	AB604002	LC496874	LC496904
<i>Simplicillium araneae</i> _DY101811	OM743774	OM743792	OM818465
<i>Simplicillium araneae</i> _DY101812	OM743840	OM743846	OM818466
<i>Simplicillium cicadellidae</i> _GY11011	MN006243	n.a.	MN022263
<i>Simplicillium cicadellidae</i> _GY11012	MN006244	n.a.	MN022264
<i>Simplicillium coccinellidae</i> _DY101791	MT453861	n.a.	MT471341
<i>Simplicillium coleopterorum</i> _SD05381	OM743920	OM743925	OM818467
<i>Simplicillium coleopterorum</i> _SD05382	OM744109	OM744170	OM818468
<i>Simplicillium cylindrosporium</i> _JCM_18170	AB603994	LC496877	LC496907
<i>Simplicillium formicae</i> _MFLUCC_18-1379	MK766511	MK766512	MK926451
<i>Simplicillium guizhouense</i> _DY10051	OM743225	OM743226	OM818453

<i>Simplicillium_guizhouense</i> _DY10052	OM743241	OM743252	OM818454
<i>Simplicillium_humicola</i> _CGMCC_3.19573	NR_172845	NG_075279	MK336071
<i>Simplicillium_hymenopterorum</i> _DY101691	MT453848	n.a.	MT471337
<i>Simplicillium_hymenopterorum</i> _DY101692	MT453851	n.a.	MT471338
<i>Simplicillium_lanosoniveum</i> _CBS_123.42	MH856100	MH867593	n.a.
<i>Simplicillium_lanosoniveum</i> _CBS_704.86	AJ292396	AF339553	DQ522358
<i>Simplicillium_larvatum</i> _DY10251	OM743255	OM743351	OM818457
<i>Simplicillium_lepidopterorum</i> _GY29131	MN006246	n.a.	MN022265
<i>Simplicillium_minatense</i> _JCM_18176	AB603992	n.a.	n.a.
<i>Simplicillium_neolepidopterorum</i> _DY101751	MT453854	n.a.	MT471339
<i>Simplicillium_neolepidopterorum</i> _DY101752	MT453857	n.a.	MT471340
<i>Simplicillium_obclavatum</i> _CBS_311.74	AJ292394	AF339517	EF468798
<i>Simplicillium_scarabaeoidea</i> _DY101391	MT453842	n.a.	MT471335
<i>Simplicillium_scarabaeoidea</i> _DY101392	MT453845	n.a.	MT471336
<i>Simplicillium_spumae</i> _JCM_39050	LC496869	LC496883	LC496913
<i>Simplicillium_subtropicum</i> _JCM_18180	AB603990	LC496880	LC496910
<i>Simplicillium_calcicola</i> _LC5371	KU746705	KU746751	KX855251
<i>Simplicillium_sympodiophorum</i> _JCM_18184	AB604003	LC496882	LC496912
<i>Simplicillium_lamellicola</i> _CBS_116.25	AJ292393	AF339552	DQ522356
<i>Simplicillium_album</i> _CGMCC_3.19635	NR_172844	NG_075278	MK336068
<i>Simplicillium_niveum</i> _BCC83036	MW621499	MW620992	MW603488
<i>Simplicillium_pechmerlense</i> _CBS_147188	MW031272	MW031268	MW033224
<i>Simplicillium_formicidae</i> _DL10041	MN006241	n.a.	n.a.
<i>Gamszarea_wallacei</i> _CBS_101237	NR_111267	NG_042398	EF469073

n.a. = not available

Supplementary Table. S2.Best hit sequence entries identified by the respective LBSim-01 query in the GenBank database.

Hit Number	Genus, Species, Strain	Accession Number	Query coverage	Percent Identity
ITS				
1	<i>Simplicillium lanosoniveum</i> strain V-93	MT508802	100%	100.00
2	<i>Simplicillium lanosoniveum</i> culture CBS:531.72	MH860557	100%	100.00
3	<i>Simplicillium lanosoniveum</i> culture CBS:321.72	MH860488	100%	100.00

4	<i>Simplicillium lanosoniveum</i> isolate SSBG2	MG807436	100%	100.00
5	<i>Simplicillium</i> sp. isolate 327	OQ878337	100%	100.00
LSU				
1	<i>Simplicillium lanosoniveum</i> isolate MFLUCC: 18-1385	MK752849	100%	100.00
2	<i>Simplicillium lanosoniveum</i> culture CBS:322.72	MH877737	100%	100.00
3	<i>Simplicillium</i> sp. strain DY091482	OR121067	100%	100.00
4	<i>Simplicillium</i> sp. strain DY091481	OR121065	100%	100.00
5	<i>Simplicillium</i> sp. strain DY09922	OR121061	100%	100.00
TEF				
1	<i>Simplicillium lanosoniveum</i> isolate CBS322.72	OQ471195	89%	99.63
2	<i>Simplicillium lanosoniveum</i> voucher CERI-542	MT131818	99%	99.56
3	<i>Simplicillium lanosoniveum</i> voucher CHE-CNRCB-544	OP820494	99%	99.56
4	<i>Simplicillium lanosoniveum</i> strain MFLUCC 18_1385	MK926450	99%	99.56
5	<i>Simplicillium lanosoniveum</i> voucher CHE-CNRCB-977	OP832376	99%	99.56