

Table S1. Assemblies retrieved from NCBI and JGI genome portals and included in the phylogenomic analyses.

Species	Strain	NCBI Accession number, JGI project number	Source	Submitters/Reference
<i>Aspergillus fischeri</i>	NRRL 181	GCA_000149645.2	NCBI	Fedorova et al. 2008
<i>Aspergillus fumigatus</i>	A1163	GCA_000150145.1	NCBI	Joardar et al. 2012
<i>Aspergillus nidulans</i>	FGSC A4	GCA_000149205.2	NCBI	Galagan et al. 2005
<i>Coccidioides immitis</i>	RS	GCA_000149335.2	NCBI	Sharpton et al. 2009
<i>Histoplasma capsulatum</i>	var. capsulatum Tmu	GCA_000313325.1	NCBI	Taipei Medical University, Urology
<i>Paracoccidioides lutzii</i>	Pb01	GCA_000150705.2	NCBI	Desjardins et al. 2011
<i>Aaosphaeria arxii</i>	CBS 175.79	1019657	JGI	Joseph Spatafora, Pedro Crous, Janneke Bloem
<i>Acidomyces richmondensis</i>	BFW	GCA_001592465.1	NCBI	Mosier et al. 2016
<i>Acidomyces richmondensis</i>	meta	GCA_001572075.1	NCBI	Mosier et al. 2016
<i>Aliquandostipite khaoyaiensis</i>	CBS 118232	1019641	JGI	Joseph Spatafora, Jon Karl Magnuson, David E Culley
<i>Alternaria alternata</i>	133aPRJ	1103683	JGI	Francis Michel Martin, Stéphane Hacquard
<i>Alternaria alternata</i>	ATCC 34957	GCA_001443195.1	NCBI	Nguyen et al. 2016
<i>Alternaria alternata</i>	B2a	GCA_001696825.1	NCBI	Wubetu Bihon, Agricultural Research Organization
<i>Alternaria alternata</i>	SRC11rK2f	GCA_001642055.1, 1029430	NCBI	Zeiner et al. 2016
<i>Alternaria alternata</i>	Z7	GCA_001572055.1	NCBI	Wang et al. 2016
<i>Alternaria arborescens</i>	EGS 39-128	GCA_000256225.1	NCBI	Hu et al. 2012
<i>Alternaria brassicicola</i>	ATCC 96836	GCA_000174375.1	NCBI	Washington University Genome Center (WUGC), Virginia Bioinformatics Institute
<i>Alternaria consortialis</i>	JCM 1940	GCA_001950455.1	NCBI	RIKEN Center for Life Science Technologies, Division of Genomic Technologies
<i>Amniculicola lignicola</i>	CBS 123094	1011329	JGI	Joseph Spatafora, Pedro Crous, Janneke Bloem
<i>Ampelomyces quisqualis</i>	HMLAC05119	1051023	JGI	Joseph Spatafora, Chen Liang
<i>Aplosporella prunicola</i>	CBS 121.167	1006427	JGI	Joseph Spatafora, Pedro Crous, Charles Cannon
<i>Ascochyta rabiei</i>	ArDII	GCA_001630375.1	NCBI	Verma et al. 2016
<i>Aulographum hederarum</i>	1006065	1006065	JGI	Joseph Spatafora, Pedro Crous, Lute-Harm Zwiers
<i>Aureobasidium melanogenum</i>	HN6.2	GCA_002156615.1	NCBI	Ocean University of China, Yi Lu
<i>Aureobasidium pullulans</i>	AY4	GCA_000294735.1	NCBI	Chen et al. 2012
<i>Aureobasidium pullulans</i>	IMV 00882	GCA_001931805.1	NCBI	Jet Propulsion Laboratory, California Institute of Technology, Kasthuri Venkateswaran

<i>Aureobasidium pullulans</i>	SAMN04565625	GCA_001678115.1	NCBI	Cruz et al. 2016
<i>Aureobasidium pullulans</i> var. <i>melanogenum</i>	CBS 110374	GCA_000721775.1, 403630	JGI	Gosticar et al. 2014
<i>Aureobasidium pullulans</i> var. <i>namibiae</i>	CBS 147.97	GCA_000721765.1, 403632	JGI	Gosticar et al. 2014
<i>Aureobasidium pullulans</i> var. <i>pullulans</i>	EXF-150	GCA_000721785.1, 403628	JGI	Gosticar et al. 2014
<i>Aureobasidium pullulans</i> var. <i>subglaciale</i>	EXF-2481	GCA_000721755.1, 403631	JGI	Gosticar et al. 2014
<i>Aureobasidium</i> sp.	FSWF8-4	GCA_001914275.1	NCBI	Uppsala University, Sarahi Garcia
<i>Baudoinia panamericana</i>	UAMH 10762	GCA_000338955.1	NCBI	Ohm et al. 2012
<i>Beverlykella pulmonaria</i>	JCM 9230	GCA_001599595.1	NCBI	RIKEN Center for Life Science Technologies, Division of Genomic Technologies
<i>Bimuria novae-zealandiae</i>	CBS 107.79	1019717	JGI	Joseph Spatafora, Pedro Crous, Janneke Bloem
<i>Bipolaris maydis</i>	ATCC 48331	GCA_000354255.1	NCBI	Ohm et al. 2012
<i>Bipolaris maydis</i>	C5	GCA_000338975.1	NCBI	Ohm et al. 2012
<i>Bipolaris oryzae</i>	ATCC 44560	GCA_000523455.1	NCBI	Condon et al 2013
<i>Bipolaris oryzae</i>	TG12bL2	GCA_001675385.1	NCBI	University of Minnesota, Juan Gutierrez-Gonzalez
<i>Bipolaris sorokiniana</i>	ND90Pr	GCA_000338995.1	NCBI	Ohm et al. 2012
<i>Bipolaris victoriae</i>	FI3	GCA_000527765.1	NCBI	Condon et al 2013
<i>Bipolaris zeicola</i>	26-R-13	GCA_000523435.1	NCBI	Condon et al 2013
<i>Botryosphaeria dothidea</i> Botdo1 1	Botdo1 1	-	JGI	Marsberg et al. 2017
<i>Botryosphaeria dothidea</i>	LW030101	GCA_001717445.1	NCBI	Qingdao Agricultural University, Sen Lian
<i>Byssothecium circinans</i>	CBS 675.92	1019709	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Cenococcum geophilum</i>	1.58	GCA_001692895.1	NCBI	Peter et al. 2016
<i>Cercospora canescens</i>	BHU	GCA_000347735.1	NCBI	Institute of Agriculture Sciences, Department of Mycology and Plant Pathology
<i>Cercospora</i> cf. <i>sigsbeckiae</i>	PP 2012 071	GCA_002217505.1	NCBI	Louisiana State University, Sebastian Albu
<i>Cercospora sojina</i>	FLS21	GCA_002150695.1	NCBI	Shrestha et al. 2017
<i>Cercospora sojina</i>	S9	GCA_002084285.1	NCBI	Zeng et al. 2017
<i>Cercospora zeaemaydis</i>	-	401984	JGI	Stephen B. Goodwin
<i>Cladosporium fulvum</i>	CBS 131901	GCA_000301015.1	NCBI	Ohm et al. 2012
<i>Cladosporium sphaerospermum</i>	IMV 00045	GCA_001931905.2	NCBI	Jet Propulsion Laboratory, California Institute of Technology, Kasthuri

Venkateswaran				
<i>Cladosporium sphaerospermum</i>	UM 843	GCA_000261425.2	NCBI	Ng et al. 2012
<i>Clathrospora elyngae</i>	CBS 161.51	1019661	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Clohesyomyces aquaticus</i>	CBS 115471	GCA_002105025.1, 1054410	NCBI	Mondo et al. 2017
<i>Cochliobolus heterostrophus</i>	C5 1	52344	JGI	Ohm et al. 2012
<i>Cochliobolus lunatus</i>	m118	403758	JGI	Ohm et al. 2012
<i>Coniosporium apollinis</i>	CBS 100218	GCA_000281105.1	NCBI	Teixeira et al. 2017
<i>Corynespora cassiicola</i>	CCP	1019537	JGI	Lopez et al. 2018
<i>Corynespora cassiicola</i>	SAMEA103891068	GCA_900169545.1	NCBI	University of Bristol
<i>Corynespora cassiicola</i>	UM 591	GCA_000603925.1	NCBI	University of Malaya
<i>Cryomyces antarcticus</i>	CCFEE 534	GCA_000504465.1	NCBI	Sterflinger et al. 2014
<i>Cucurbitaria berberidis</i>	CBS 394.84	1006069	JGI	Joseph Spatafora, Pedro Crous, Janneke Bloem
<i>Curvularia lunata</i>	CX-3	GCA_000743335.1	NCBI	Gao et al. 2014
<i>Curvularia papendorffii</i>	UM 226	GCA_000817285.1	NCBI	Kuan et al. 2015
<i>Curvularia</i> sp.	IFB-Z10	GCA_002161795.1	NCBI	Han et al. 2014
<i>Decorospora gaudefroyi</i>	P77 CBS 332.63	1032355	JGI	Joseph Spatafora, Patrik Inderbitzin
<i>Delitschia confertaspora</i>	ATCC 74209	1020481	JGI	Joseph Spatafora, Gerald Bills
<i>Delphinella strobiligena</i>	CBS 735.71	1019673	JGI	Joseph Spatafora, Jon Karl Magnuson, David E Culley
<i>Didymella exigua</i>	CBS 183.55	407831	JGI	Joseph Spatafora
<i>Didymella zaeae-maydis</i>	3018	-	JGI	Gillian Turgeon
<i>Didymocrea sadasivanii</i>	CBS 438.65	1054428	JGI	Joseph Spatafora, Jon Karl Magnuson, David E Culley
<i>Diplodia corticola</i>	CBS 112549	GCA_001883845.1	NCBI	University of Aveiro
<i>Diplodia sapinea</i>	CMW 190	GCA_000671355.1	NCBI	Bihon et al. 2014
<i>Diplodia sapinea</i>	CMW39103	GCA_000729945.1	NCBI	van der Nest et al. 2014
<i>Diplodia scrobiculata</i>	CMW30223	GCA_001455585.1	NCBI	Wingfield et al. 2015
<i>Diplodia seriata</i>	DS831	GCA_001006355.1	NCBI	Morales-Cruz et al. 2015
<i>Diplodia seriata</i>	F98.1	GCA_001975905.1	NCBI	INRA, Guillaume Robert
<i>Dissoconium aciculare</i>	CBS 342.82	1011337	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Dothidotthia symphoricarpi</i>	CBS 119.687	1011345	JGI	Joseph Spatafora, Pedro Crous, Janneke Bloem
<i>Dothistroma pini</i>	CBS 116.487	GCA_002116355.1	NCBI	Canada's Michael Smith Genome Sciences Centre
<i>Dothistroma septosporum</i>	CMW 10211	GCA_002236575.1	NCBI	Massey University
<i>Dothistroma septosporum</i>	CMW 10798	GCA_002236655.1	NCBI	Massey University
<i>Dothistroma</i>	CMW 11305	GCA_002236515.1	NCBI	Massey University

<i>septosporum</i>				
<i>Dothistroma septosporum</i>	CMW 13121	GCA_002236675.1	NCBI	Massey University
<i>Dothistroma septosporum</i>	CMW 13123	GCA_002236485.1	NCBI	Massey University
<i>Dothistroma septosporum</i>	CMW 14822	GCA_002236475.1	NCBI	Massey University
<i>Dothistroma septosporum</i>	CMW 14823	GCA_002236775.1	NCBI	Massey University
<i>Dothistroma septosporum</i>	CMW 15843	GCA_002236615.1	NCBI	Massey University
<i>Dothistroma septosporum</i>	CMW 23429	GCA_002236725.1	NCBI	Massey University
<i>Dothistroma septosporum</i>	CMW 37193	GCA_002236645.1	NCBI	Massey University
<i>Dothistroma septosporum</i>	CMW 37194	GCA_002236545.1	NCBI	Massey University
<i>Dothistroma septosporum</i>	CMW 37965	GCA_002236745.1	NCBI	Massey University
<i>Dothistroma septosporum</i>	CMW 38941	GCA_002236925.1	NCBI	Massey University
<i>Dothistroma septosporum</i>	CMW 40004	GCA_002236585.1	NCBI	Massey University
<i>Dothistroma septosporum</i>	CMW 44207	GCA_002236565.1	NCBI	Massey University
<i>Dothistroma septosporum</i>	CMW 44656	GCA_002236685.1	NCBI	Massey University
<i>Dothistroma septosporum</i>	MU NZE8	GCA_002236465.1	NCBI	Massey University
<i>Dothistroma septosporum</i>	NZE10 v1.0	GCA_000340195.1	NCBI	Ohm et al. 2012
<i>Dothistroma septosporum</i>	NZFS4520	GCA_002236755.1	NCBI	Massey University
<i>Elsinoe ampelina</i> CECT 20119	CECT 20119	1064684	JGI	Joseph Spatafora, Manuel Alfaro Sánchez
<i>Epicoccum nigrum</i>	ICMP 19927	GCA_002116315.1	NCBI	The University of Auckland
<i>Epicoccum sorghinum</i>	USPMTOX48	GCA_001879705.1	NCBI	University of Sao Paulo
<i>Eremomyces bilateralis</i>	CBS 781.70	1011349	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Glonium stellatum</i>	CBS 207.34	GCA_001692915.1	NCBI	Spatafora et al. 2012
<i>Helminthosporium solani</i>	B-AC-16A	GCA_000498615.1	NCBI	University of Wisconsin-Madison
<i>Hortaea acidophila</i>	CBS 113389	1040524	JGI	Joseph Spatafora, Jon Karl Magnuson
<i>Hortaea werneckii</i>	EXF-2000	GCA_002127715.1	NCBI	University of California, Riverside
<i>Hortaea werneckii</i>	EXF-2000M0 scaffolds	GCA_000410955.1	NCBI	Lenassi et al. 2013
<i>Hysterium pulicare</i>	CBS 123377	GCA_000467715.1	NCBI	Ohm et al. 2012
<i>Karstenula rhodostoma</i>	CBS 690.94	1019721	JGI	Joseph Spatafora, Pedro Crous, Janneke Bloem
<i>Lasiodiplodia theobromae</i>	CSS-01s	GCA_002111425.1	NCBI	Beijing Academy of Agriculture and Forestry Sciences

<i>Lecanosticta acicola</i>	CBS 871.95	GCA_000504345.2	NCBI	Canada's Michael Smith Genome Sciences Centre
<i>Lentithecium fluviatile</i>	CBS 122.367	1006093	JGI	Joseph Spatafora, Pedro Crous, Janneke Bloem
<i>Lepidopterella palustris</i>	CBS 459.81	GCA_001692735.1	NCBI	Peter et al.2016
<i>Leptosphaeria maculans</i>	JN3	GCA_000230375.1	NCBI	Rouxel et al. 2011
<i>Leptosphaeria maculans</i>	NZT4	GCA_900465115.1	NCBI	Genomic Standards Consortium
<i>Leptoxylum fumago</i>	SC3815	GCA_001660795.1	NCBI	International Institute Zittau - TU Dresden, Harald Kellner
<i>Lindgomyces ingoldianus</i>	ATCC 200398	1042879	JGI	Joseph Spatafora, Jon Karl Magnuson, David E Culley
<i>Lineolata rhizophorae</i>	ATCC16933	1051209	JGI	Joseph Spatafora, Jon Karl Magnuson, David E Culley
<i>Lizonia empirigonia</i>	CBS 542.76	1019757	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Lophiostoma macrostomum</i>	CBS 122.681	1011357	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Lophiotrema nucula</i>	CBS 627.86	1019701	JGI	Joseph Spatafora, Jon Karl Magnuson, David E Culley
<i>Lophium mytilinum</i>	CBS 269.34	1019725	JGI	Joseph Spatafora, Pedro Crous, Janneke Bloem
<i>Macrophomina phaseolina</i>	MO00014	GCA_001307885.1	NCBI	University of Illinois, Gloria Rendon
<i>Macrophomina phaseolina</i>	MP00003	GCA_001307925.1	NCBI	University of Illinois, Gloria Rendon
<i>Macrophomina phaseolina</i>	MP00065	GCA_001307945.1	NCBI	University of Illinois, Gloria Rendon
<i>Macrophomina phaseolina</i>	MP00325	GCA_001307935.1	NCBI	University of Illinois, Gloria Rendon
<i>Macrophomina phaseolina</i>	MP00327	GCA_001307955.1	NCBI	University of Illinois, Gloria Rendon
<i>Macrophomina phaseolina</i>	MRf1	GCA_001051165.1	NCBI	Junagadh Agricultural University, Manoj Parakhia
<i>Macrophomina phaseolina</i>	MS6	GCA_000302655.1	NCBI	Islam et al. 2012
<i>Macroventuria anomochaeta</i>	CBS 525.71	1019665	JGI	Joseph Spatafora, Pedro Crous, Janneke Bloem
<i>Massarina eburnea</i>	CBS 473.64	1011361	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Massariosphaeria phaeospora</i>	CBS 611.86	1019705	JGI	Joseph Spatafora, Jon Karl Magnuson, David E Culley
<i>Melanomma pulvis-pyrius</i>	1011365	1011365	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Microthyrium microscopicum</i>	CBS 115976	1011369	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Mycosphaerella arachidis</i>	CALF-13A	GCA_001297265.1	NCBI	Orner et al. 2015
<i>Mycosphaerella eumusae</i>	CBS 114824	GCA_001578235.1	NCBI	Chang et al. 2016
<i>Mycosphaerella graminicola</i>	-	16205	JGI	Goodwin et al. 2011

<i>Mycosphaerella laricina</i>	CBS 326.52	GCA_000504385.2	NCBI	Canada's Michael Smith Genome Sciences Centre
<i>Mycosphaerella</i> sp.	PB-2012b Mex 2-1-2	GCA_002116345.1	NCBI	Canada's Michael Smith Genome Sciences Centre
<i>Mycosphaerella</i> sp.	Ston1	GCA_000504405.2	NCBI	Canada's Michael Smith Genome Sciences Centre
<i>Myriangium duriaei</i>	CBS 260.36	1006105	JGI	Joseph Spatafora, Pedro Crous, Janneke Bloem
<i>Mytilinidion resinicola</i>	CBS 304.34	1040537	JGI	Joseph Spatafora, Jon Karl Magnuson, David E Culley
<i>Neofusicoccum parvum</i>	UCRNP2	GCA_000385595.1	NCBI	Blanco-Ulate et al. 2013
<i>Nigrograna mackinnonii</i>	E5202H	GCA_001007845.1	NCBI	Shaw et al. 2015
<i>Ochroconis constricta</i>	UM 578	GCA_000611715.1	NCBI	Chan et al. 2014
<i>Ophiobolus disseminans</i>	CBS 113818	1019733	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Paraphaeosphaeria sporulosa</i>	AP3s5-JAC2a	1029422	JGI	Zeinier at al. 2016
<i>Paraphoma</i> sp.	B47-9	GCA_001748405.1	NCBI	National Institute for Agro-Environmental Sciences (NIAES)
<i>Parastagonospora nodorum</i>	SN15	GCA_000146915.2	NCBI	National Institute for Agro-Environmental Sciences (NIAES)
<i>Patellaria atrata</i>	CBS 101060	1006113	JGI	Joseph Spatafora, Pedro Crous, Janneke Bloem
<i>Peltaster fructicola</i>	LNHT1506	GCA_001592805.1	NCBI	Xu et al. 2016
<i>Periconia macrospinoso</i>	DSE2036	1025594	JGI	Knapp et al. 2018
<i>Phaeocryptopus gaeumannii</i>	CBS 267.37	GCA_002116385.1	NCBI	Canada's Michael Smith Genome Sciences Centre
<i>Phaeosphaeria nodorum</i>	Sn79 1.0	GCA_002216185.1	NCBI	Canada's Michael Smith Genome Sciences Centre
Phaeosphaeriaceae sp.	PMI 808	1021562	JGI	Joseph Spatafora, Gregory Bonito, Hui-Ling Liao
<i>Phoma herbarum</i>	JCM 15942	GCA_001599375.1	NCBI	RIKEN Center for Life Science Technologies, Division of Genomic Technologies
<i>Phoma tracheiphila</i>	IPT5	1021241	JGI	Joseph Spatafora, David Ezra
<i>Phyllosticta capitalensis</i>	CBS 128.856	1109085	JGI	Francis Michel Martin, Vladimiro Guarnaccia
<i>Phyllosticta capitalensis</i>	Gm33	GCA_001604925.1	NCBI	RIKEN Center for Life Science Technologies, Division of Genomic Technologies
<i>Phyllosticta citriasiana</i>	CBS 120486	1011301	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Phyllosticta citribraziliensis</i>	CBS 100098	1109089	JGI	Francis Michel Martin, Vladimiro Guarnaccia
<i>Phyllosticta citricarpa</i>	CGMCC3.14348	GCA_000382785.1	NCBI	Zhejiang university
<i>Phyllosticta citricarpa</i>	Gc12	GCA_001604955.1	NCBI	Citrus Research and Education Center, University of Florida
<i>Phyllosticta citrichinaensis</i>	CBS 130529	1109091	JGI	Francis Michel Martin, Vladimiro Guarnaccia

<i>Phyllosticta</i> sp.	CPC 27169	1109095	JGI	Francis Michel Martin, Vladimiro Guarnaccia
<i>Phyllosticta</i> sp.	CPC 27913	1109093	JGI	Francis Michel Martin, Vladimiro Guarnaccia
<i>Piedraia hortae</i>	CBS 480.64	1011305	JGI	Joseph Spatafora, Pedro Crous, Janneke Bloem
<i>Pleomassaria siparia</i>	CBS279.74	1011309	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Pleosporales</i> sp.	UM 1110	GCA_000263175.2	NCBI	Ng et al. 2012
<i>Polychaeton citri</i>	-	1011313	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Polyplosphaeria fusca</i>	CBS 125425	1019777	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Preussia</i> sp.	BSL10	GCA_001553865.1	NCBI	University of Nizwa, Abdul Khan
<i>Pseudocercospora fijiensis</i>	CIRAD86	GCA_000340215.1	NCBI	Ohm et al. 2012
<i>Pseudocercospora musae</i>	CBS 116634	GCA_001578225.1	NCBI	Chang et al. 2016
<i>Pseudocercospora pini-densiflorae</i>	CBS 125139	GCA_000504365.2	NCBI	Canada's Michael Smith Genome Sciences Centre
<i>Pseudovirgaria hyperparasitica</i>	CBS 121739	1032442	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Pyrenochaeta lycopersici</i>	CRA-PAV ER 1211	GCA_000601435.1	NCBI	Aragona et al. 2014
<i>Pyrenochaeta</i> sp.	DS3sAY3a	GCA_001644535.1	NCBI	Zeiner et al. 2016
<i>Pyrenochaeta</i> sp.	UM 256	GCA_000359685.1	NCBI	Yew et al. 2013
<i>Pyrenophora seminiperda</i>	CCB06	GCA_000465215.1	NCBI	Soliai et al. 2014
<i>Pyrenophora teres</i>	f. teres 0-1	GCA_000166005.1	NCBI	Ellwood et al. 2010
<i>Pyrenophora tritici- repentis</i>	Pt-1C-BFP	GCA_000149985.1	NCBI	Broad Institute of MIT and Harvard
<i>Rachicladosporium antarcticum</i>	CCFEE 5527	GCA_002077065.1	NCBI	Coleine et al. 2017
<i>Rachicladosporium</i> sp.	CCFEE 5018	GCA_002077045.2	NCBI	Coleine et al. 2017
<i>Ramularia collo-cygni</i>	DK05	GCA_001510955.1	NCBI	European Bioinformatics Institute (EBI)
<i>Ramularia endophylla</i>	CBS 113265	GCA_002116395.1	NCBI	Canada's Michael Smith Genome Sciences Centre
<i>Rhizodiscina lignyota</i>	CBS 133067	1019729	JGI	Joseph Spatafora, Pedro Crous, Janneke Bloem
<i>Rhytidhysterion rufulum</i>	CBS 306.38	GCA_000467735.1, 1019729	NCBI	Ohm et al. 2012
<i>Saccharata proteae</i>	CBS 121410	1011317	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Setomelanomma holmii</i>	CBS 110217	1019737	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Setosphaeria turcica</i>	Et28A	GCA_000359705.1	NCBI	Ohm et al. 2012
<i>Setosphaeria turcica</i>	NY001	1036047	JGI	Gerrit HJ Kema, Gillian Turgeon
<i>Shiraia</i> sp.	slf14	GCA_000498155.1	NCBI	Yang et al. 2014
<i>Sphaerulina musiva</i>	SO2202	GCA_000320565.2	NCBI	Ohm et al. 2012
<i>Sphaerulina populicola</i>	P02.02b	GCA_000291705.1	NCBI	University of British Columbia,

Forest Sciences				
<i>Sporormia fimetaria</i>	CBS 119.925	1011321	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Stagonospora</i> sp.	SRC11sM3a	GCA_001644525.1	NCBI	Zeiner et al. 2016
<i>Stagonosporopsis tanacetii</i>	CBS 131484	GCA_000812845.1	NCBI	Vaghefi et al. 2015
<i>Stemphylium lycopersici</i>	CIDEFI 216	GCA_001191545.1	NCBI	Franco et al. 2015
<i>Teratosphaeria nubilosa</i>	CBS 116005	1019765	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Tothia fuscella</i>	CBS 130266	1019713	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Trematosphaeria pertusa</i>	CBS 122368	1019781	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Trichodelitschia bisporula</i>	CBS 262.69	1019741	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Trypethelium eluteriae</i>	-	1006394	JGI	Stephen Goodwin, Daniele Armaleo
<i>Venturia carpophila</i>	JP3-5	GCA_001990985.1	NCBI	USDA-ARS, Chunxian Chen
<i>Venturia effusa</i>	3Des10b	GCA_001901625.1	NCBI	Bock et al. 2016
<i>Venturia inaequalis</i>	1389	GCA_002148275.1	NCBI	Shiller et al. 2015
<i>Venturia inaequalis</i>	1639	GCA_002148295.1	NCBI	Shiller et al. 2015
<i>Venturia inaequalis</i>	EU-B04	GCA_002148305.1	NCBI	Shiller et al. 2015
<i>Venturia inaequalis</i>	ICMP 13258	GCA_001857725.1	NCBI	Shiller et al. 2015
<i>Venturia pyrina</i>	ICMP 11032	GCA_000738655.1	NCBI	Cooke et al. 2014
<i>Verruconis gallopava</i>	CBS 43764	GCA_000836295.1	NCBI	Broad Institute, Sinead Chapman
<i>Verruculina enalia</i>	CBS 304.66	1019669	JGI	Joseph Spatafora, Pedro Crous, Janneke Bloem
<i>Westerdykella ornata</i>	CBS 379.55	1019761	JGI	Joseph Spatafora, Pedro Crous, Manfred JK Binder
<i>Zasmidium cellare</i>	ATCC 36951	402903	JGI	Stephen B. Goodwin
<i>Zopfia rhizophila</i>	-	1011325	JGI	Joseph Spatafora, Pedro Crous, Janneke Bloem
<i>Zymoseptoria ardabiliae</i>	ST11IR 6.1.1	GCA_000983525.1	NCBI	Grandaubert et al. 2015
<i>Zymoseptoria ardabiliae</i>	STIR04 1.1.1	GCA_000223745.2	NCBI	Stukenbrock et al. 2011
<i>Zymoseptoria ardabiliae</i>	STIR04 1.1.2	GCA_000223765.2	NCBI	Stukenbrock et al. 2011
<i>Zymoseptoria ardabiliae</i>	STIR04 3.13.1	GCA_000223785.2	NCBI	Stukenbrock et al. 2011
<i>Zymoseptoria ardabiliae</i>	STIR04 3.3.2	GCA_000223805.2	NCBI	Stukenbrock et al. 2011
<i>Zymoseptoria brevis</i>	ZB163	GCA_000983655.1	NCBI	Grandaubert et al. 2015
<i>Zymoseptoria brevis</i>	Zb18110	GCA_000966595.1	NCBI	Grandaubert et al. 2015
<i>Zymoseptoria passerinii</i>	SP63	GCA_000223825.2	NCBI	Stukenbrock et al. 2011
<i>Zymoseptoria pseudotritici</i>	ST04IR 5.5	GCA_000983605.1	NCBI	Grandaubert et al. 2015
<i>Zymoseptoria pseudotritici</i>	STIR04 2.2.1	GCA_000223665.2	NCBI	Stukenbrock et al. 2011

<i>Zymoseptoria pseudotritici</i>	STIR04 3.11.1	GCA_000226675.2	NCBI	Stukenbrock et al. 2011
<i>Zymoseptoria pseudotritici</i>	STIR04 4.3.1	GCA_000223685.2	NCBI	Stukenbrock et al. 2011
<i>Zymoseptoria pseudotritici</i>	STIR04 5.3	GCA_000223705.2	NCBI	Stukenbrock et al. 2011
<i>Zymoseptoria pseudotritici</i>	STIR04 5.9.1	GCA_000223725.2	NCBI	Stukenbrock et al. 2011
<i>Zymoseptoria tritici</i>	ST99CH 1A5	GCA_900099495.1	NCBI	European Bioinformatics Institute (EBI)
<i>Zymoseptoria tritici</i>	ST99CH 3D7	GCA_900091695.1	NCBI	European Bioinformatics Institute (EBI)
<i>Zymoseptoria tritici</i>	STIR04 A26b	GCA_000223645.2	NCBI	Stukenbrock et al. 2011
<i>Zymoseptoria tritici</i>	STIR04 A48b	GCA_000223625.2	NCBI	Stukenbrock et al. 2011

Table S2. RF distances and normalized RF distance among the main phylogenies generated from the datasets containing the complete set of samples. Three distances are reported: a regular RF distance and two flavours of weighted RF distance as reported in RAxML 8.2 manual. Numbers in the first two columns refer to the following starting datasets and reconstruction methods: (0) “>1kb Gblocks” IQTree run 1, (1) “>1kb Gblocks” IQTree run 2, (2) “>1kb Gblocks” IQTree run 3, (3) “>1kb Gblocks” ASTRAL, (4) “Complete Gblocks” IQTree, (5) “>1Kb GUIDANCE” IQTree, (6) “>1Kb GUIDANCE” ASTRAL.

Phylogenies			RF	WRF1		WRF2	
0	1	0	0,000	0,000	0,000	2,700	0,006
0	2	0	0,000	0,000	0,000	1,300	0,003
0	3	52	0,109	24,620	0,052	444,500	0,930
0	4	30	0,063	27,060	0,057	28,320	0,059
0	5	30	0,063	27,720	0,058	29,880	0,063
0	6	52	0,109	24,450	0,051	444,610	0,930
1	2	0	0,000	0,000	0,000	2,040	0,004
1	3	52	0,109	24,160	0,051	443,900	0,929
1	4	30	0,063	26,800	0,056	29,280	0,061
1	5	30	0,063	27,410	0,057	30,330	0,063
1	6	52	0,109	24,010	0,050	443,990	0,929
2	3	52	0,109	24,510	0,051	444,190	0,929
2	4	30	0,063	26,780	0,056	28,260	0,059
2	5	30	0,063	27,610	0,058	29,930	0,063
2	6	52	0,109	24,270	0,051	444,370	0,930
3	4	56	0,117	26,130	0,055	443,450	0,928
3	5	48	0,100	23,000	0,048	447,200	0,936
3	6	12	0,025	0,020	0,000	0,160	0,000
4	5	28	0,059	25,380	0,053	27,720	0,058
4	6	52	0,109	24,220	0,051	445,340	0,932
5	6	48	0,100	22,860	0,048	447,280	0,936

Table S3. RF distances and normalized RF distances from the reference topology of the 30 resampled matrices for each resampling effort value (0.1-30 %).

	0,1%	1%	10%	20%	30%					
120	0,251	52	0,109	22	0,046					
144	0,301	66	0,138	44	0,092					
160	0,335	74	0,155	26	0,054					
148	0,310	70	0,146	34	0,071					
162	0,339	58	0,121	32	0,067					
172	0,360	66	0,138	34	0,071					
146	0,305	62	0,130	36	0,075					
138	0,289	66	0,138	32	0,067					
146	0,305	52	0,109	24	0,050					
160	0,335	70	0,146	32	0,067					
148	0,310	60	0,126	34	0,071					
142	0,297	70	0,146	38	0,079					
140	0,293	64	0,134	26	0,054					
138	0,289	60	0,126	52	0,109					
138	0,289	64	0,134	40	0,084					
134	0,280	76	0,159	22	0,046					
158	0,331	74	0,155	26	0,054					
158	0,331	42	0,088	38	0,079					
160	0,335	76	0,159	42	0,088					
134	0,280	70	0,146	28	0,059					
146	0,305	66	0,138	24	0,050					
142	0,297	78	0,163	36	0,075					
158	0,331	60	0,126	30	0,063					
172	0,360	60	0,126	46	0,096					
142	0,297	78	0,163	34	0,071					
144	0,301	48	0,100	40	0,084					
130	0,272	54	0,113	26	0,054					
138	0,289	62	0,130	38	0,079					
136	0,285	58	0,121	26	0,054					
142	0,297	62	0,130	26	0,054					
Average	147	0,307	64	0,134	33	0,069	24	0,050	20	0,041
SD	12	0,026	9	0,019	8	0,016	7	0,016	5	0,011

Table S4. Average values and standard deviation (SD) of RF distances and normalized RF distances among the 30 phylogenies generated from the randomly resampled matrix with the same resampling effort.

	0,1%		1%		10%		20%		30%	
	RF	nRF	RF	nRF	RF	nRF	RF	nRF	RF	nRF
Average	183	0,384	75	0,158	41	0,086	32	0,067	26	0,055
SD	19	0,036	10	0,019	8	0,016	8	0,016	7	0,014

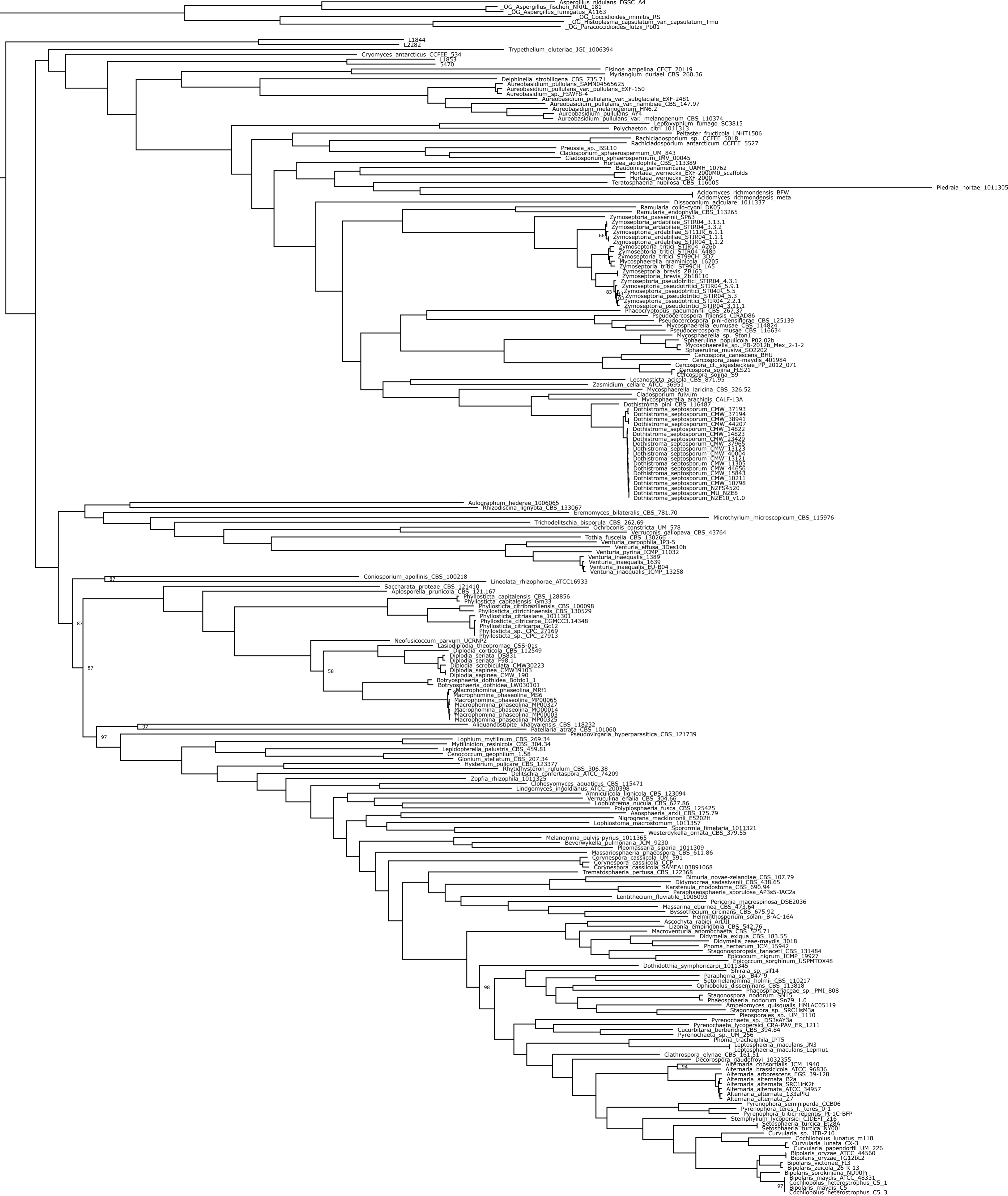
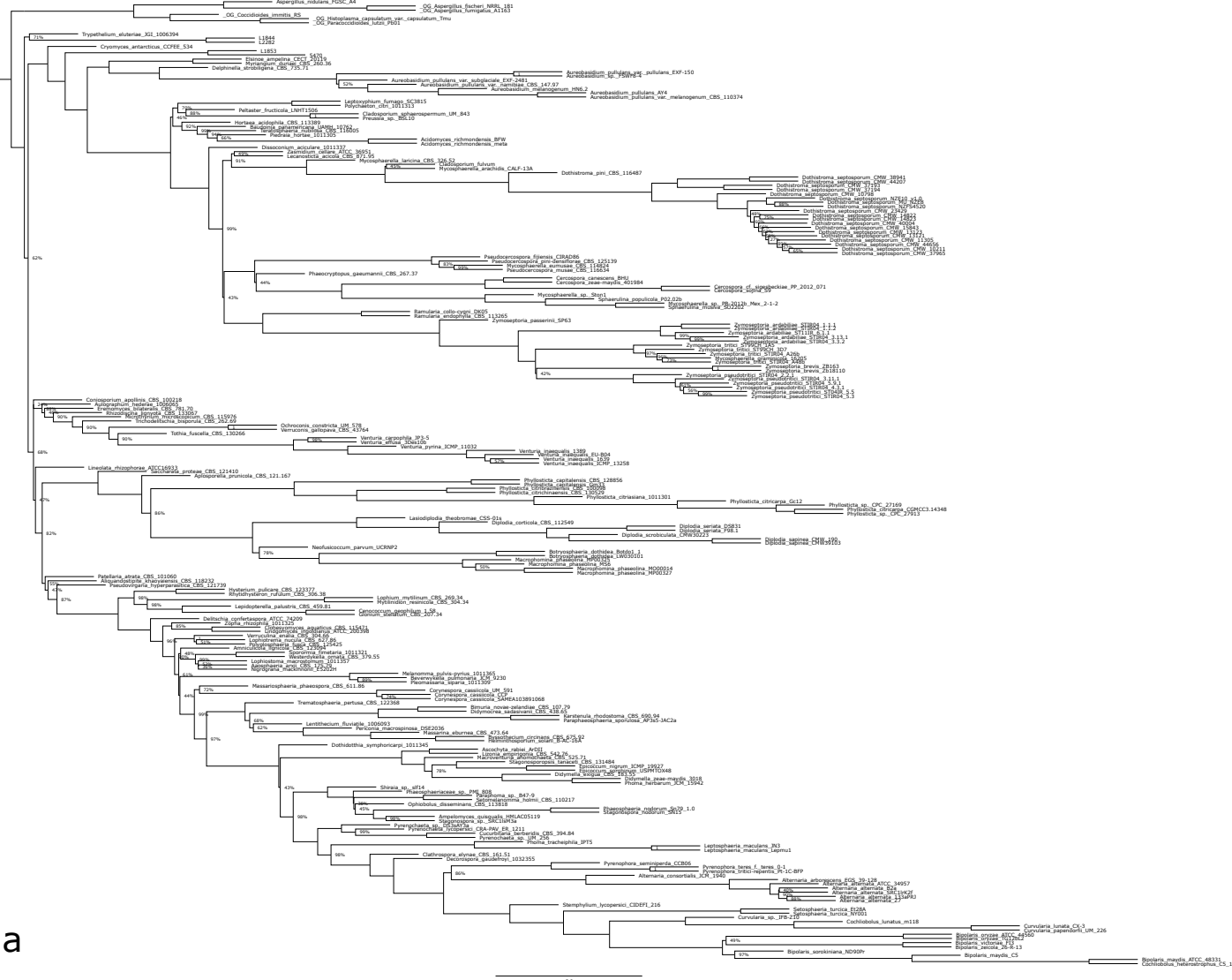
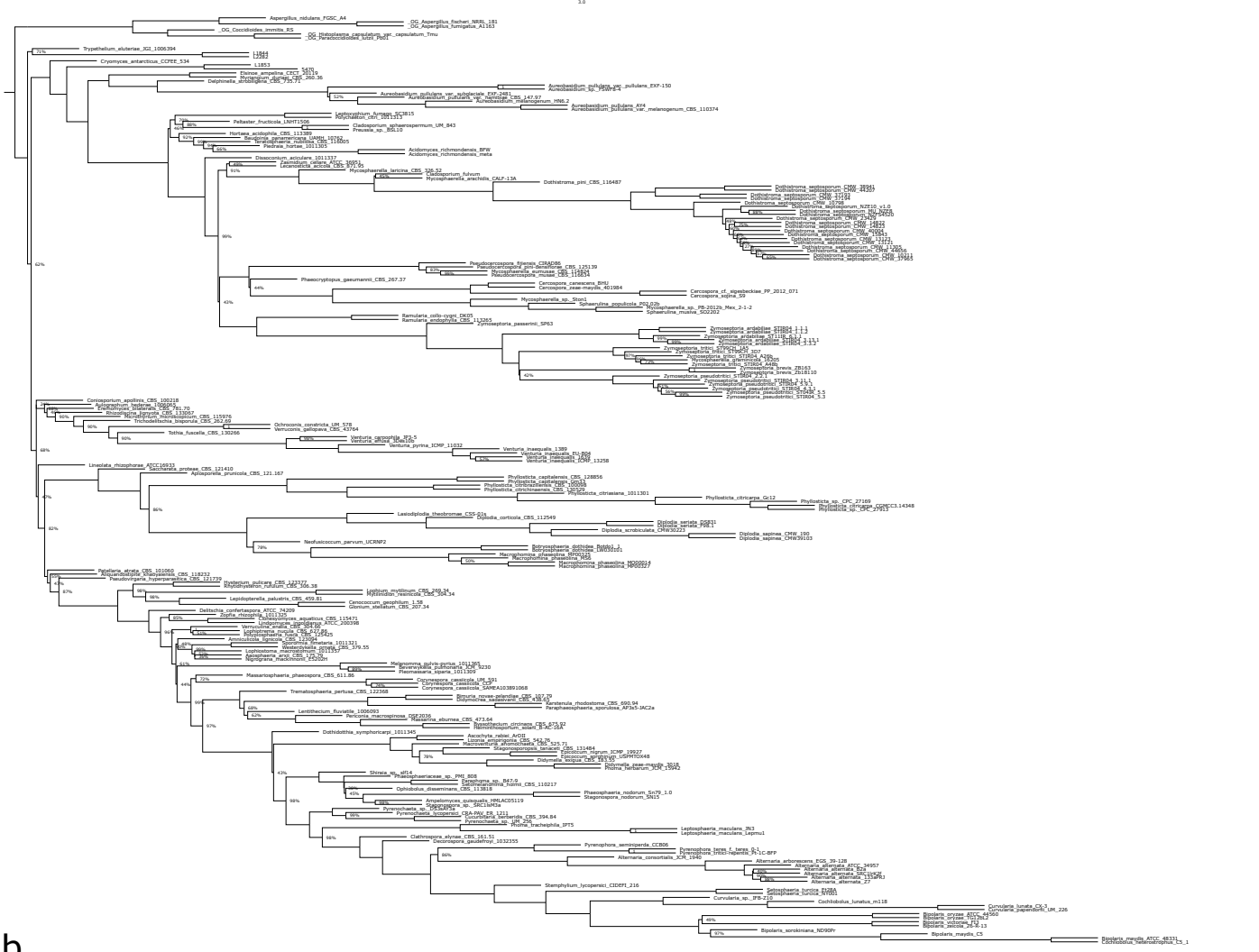


Figure S2. 2998 concatenated genes phylogeny generated from “Complete Gblocks” dataset with IQTree. Support values different from 100 are shown.



a



b

Figure S3 63 gene phylogeny generated from “No missing” dataset ; (a) ML tree generated with IQTree on concatenated genes, (b) ASTRAL III species tree. Support values different from 100 are shown.

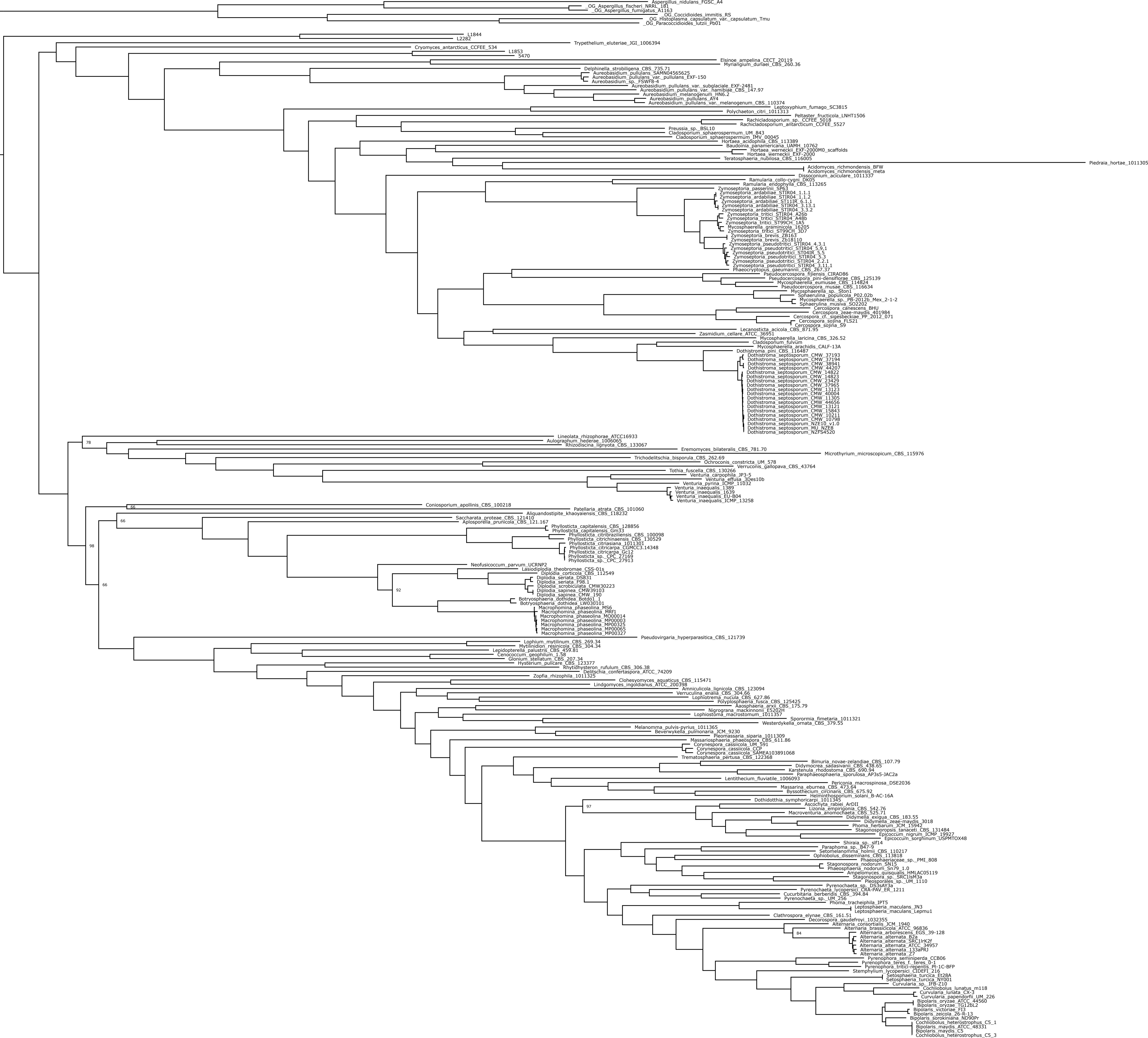


Figure S4. 1260 concatenated genes phylogeny generated from “>1Kb GUIDANCE” dataset with IQTree. Support values different from 100 are shown.

