

Supplementary Table S1. *Penicillium* spp. sequences used in this study.

Species name	Strains	GenBank accession number			
		ITS	<i>BenA</i>	<i>CaM</i>	<i>rpb2</i>
<i>Penicillium abidjanum</i>	CBS 246.67 = ATCC 18385 = FRR 1156 = IMI 136244 ^T	GU981582	GU981650	KF296383	JN121469
<i>Penicillium aeris</i>	CBS 135897 = DTO 207D4 ^T	KF303654	KF303614	KF303627	KF303681
<i>Penicillium alagoense</i>	URM 8086 ^T	MK804503	MK802333	MK802336	MK802338
<i>Penicillium alfredii</i>	CBS 138224 = DTO 269-A4 ^T	KJ775684	KJ775177	KJ775411	KJ834520
<i>Penicillium amphipolaria</i>	DAOMC 250551 = CBS 140997 ^T	KT887872	KT887833	KT887794	-
<i>Penicillium annulatum</i>	CBS 135126 = DTO 180-G7 ^T	JX091426	JX091514	JX141545	KF296410
<i>Penicillium araracuaraense</i>	CBS 113149 = IBT 23247 ^T	GU981597	GU981642	KF296373	KF296414
<i>Penicillium austriicola</i>	CBS 135900 = DTO 183E6 = DAOM 241066 ^T	JX091466	JX091579	JX141600	KF303705
<i>Penicillium austrosinense</i>	CGMCC 3.18797 = CBS 144505 ^T	KY495007	KY495116	KY494947	KY495061
<i>Penicillium bissettii</i>	DAOMC 167011 = CBS 140972 ^T	KT887845	KT887806	KT887767	-
<i>Penicillium brasilianum</i>	CBS 253.55 = ATCC 12072 = FRR 3466 ^T	GU981577	GU981629	AB667857	KF296420
<i>Penicillium brefeldianum</i>	CBS 235.81 = NRRL 710 = FRR 710 = IFO 31731 = IMI 216896 ^T	AF033435	GU981623	AB667857	KF296421
<i>Penicillium camponotum</i>	DAOMC 250557 = CBS 140982 ^T	KT887855	KT887816	KT887777	-
<i>Penicillium cantabricum</i>	CBS 120415 = DTO 76I9 = FMR 9121 ^T	KF303655	KF303615	KF303646	KF303682
<i>Penicillium caperatum</i>	CBS 443.75 = ATCC 28046 ^T	KC411761	GU981660	KF296392	KF296422

<i>Penicillium catalonicum</i>	CBS 110532 = DTO 78H5 [†]	KF303650	KF303609	KF303644	KF303683
<i>Penicillium cataractum</i>	DAOMC 250534 = CBS 140974 [†]	KT887847	KT887808	KT887769	-
<i>Penicillium cluniae</i>	CBS 326.89 [†]	KF296406	KF296471	KF296402	KF296424
<i>Penicillium coeruleum</i>	CBS 141.45 [†]	GU981606	GU981655	KF296393	KF296425
<i>Penicillium corylophilum</i>	CBS 330.79 [†]	GU944557	GU944519	GU944607	JN406569
<i>Penicillium cremeogriseum</i>	CBS 223.66 = ATCC 18320 = ATCC 18323 = FRR 1734 = IMI 197492 = NRRL 3389 [†]	GU981586	GU981624	KF296403	KF296426
<i>Penicillium cryptum</i>	CBS 271.89 = DTO 122C9 = ATCC 60138 = IMI 296794 = NRRL 13460 [†]	KF303647	KF303608	KF303628	JN121478
<i>Penicillium curticaule</i>	CBS 135127 = DTO 180-D3 = DAOM 241159 [†]	FJ231021	JX091526	JX141536	KF296417
<i>Penicillium daleae</i>	CBS 211.28 = ATCC 10435 = FRR 2025 = IFO 6087 = IFO 9072 [†]	GU981583	GU981649	KF296385	KF296427
<i>Penicillium diatomitis</i>	CBS 140107 = IBT 30728 [†]	FJ430748	HE651133	LT970912	LT797560
<i>Penicillium ehrlichii</i>	CBS 324.48 = ATCC 10442 = IMI 039737 = NRRL 708 [†]	AF033432	GU981652	KF296395	KF296428
<i>Penicillium elleniae</i>	CBS 118135 = IBT 23229 [†]	GU981612	GU981663	KF296389	KF296429
<i>Penicillium excelsum</i>	ITAL7572 = IBT 31516 [†]	KR815341	KP691061	KR815342	-
<i>Penicillium flaviroseum</i>	CGMCC 3.18805 = CBS 144479 [†]	KY495032	KY495141	KY494972	KY495083
<i>Penicillium fructuariae-cellae</i>	CBS 145110 [†]	MK039434	KU554679	MK045337	-
<i>Penicillium glaucoroseum</i>	CBS 138908 = NRRL 908 (Not type) [†]	KF296407	KF296469	KF296400	KF296430
<i>Penicillium globosum</i>	CGMCC 3.18800 = CBS 144639 [†]	KY495014	KY495123	KY494954	KY495067
<i>Penicillium griseoflavum</i>	CGMCC 3.18799 = CBS 144525 [†]	KY495011	KY495120	KY494951	KY495064

<i>Penicillium griseopurpureum</i>	CBS 406.65 = ATCC 22353 = FRR 3429 = IFO 9147 = IMI 096157 [†]	KF296408	KF296467	KF296384	KF296431
<i>Penicillium guaibinense</i>	CCDCA 11512 [†]	MH674389	MH674391	MH674393	-
<i>Penicillium guangxiense</i>	CGMCC 3.18793 = CBS 144526 [†]	KY494986	KY495095	KY494926	-
<i>Penicillium hainanense</i>	CGMCC 3.18798 = CBS 144527 [†]	KY495009	KY495118	KY494949	-
<i>Penicillium infrabuccalum</i>	DAOMC 250537 = CBS 140983 [†]	KT887856	KT887817	KT887778	-
<i>Penicillium janthinellum</i>	CBS 340.48 = ATCC 10455 = IMI 040238 = NRRL 2016 [†]	GU981585	GU981625	KF296401	JN121497
<i>Penicillium javanicum</i>	CBS 341.48 = ATCC 9099 = IFO 31735 = IMI 039733 = MUCL 29099 = NRRL 707 [†]	GU981613	GU981657	KF296387	JN121498
<i>Penicillium jianfenglingense</i>	CGMCC 3.18802 = CBS 144640 [†]	KY495016	KY495125	KY494956	KY495069
<i>Penicillium koreense</i>	KACC 47721 [†]	KJ801939	KM000846	-	-
<i>Penicillium laevigatum</i>	CGMCC 3.18801 = CBS 144481 [†]	KY495015	KY495124	KY494955	KY495068
<i>Penicillium lagena</i>	CBS 185.65 = DTO 7718 = MUCL 8221 [†]	KF303665	KF303619	KF303634	JN121450
<i>Penicillium lassenii</i>	CBS 277.70 = DTO 95D6 = NRRL 5272 = ATCC 22054 = FRR 858 = IMI 148395 [†]	KF303648	KF303607	KF303629	JN121481
<i>Penicillium levitum</i>	CBS 345.48 = ATCC 10464 = IFO 6101 = IFO 8849 = IMI 039735 [†]	GU981607	GU981654	KF296394	KF296432
<i>Penicillium limosum</i>	CBS 339.97 [†]	GU981568	GU981621	KF296398	KF296433
<i>Penicillium lineolatum</i>	CBS 188.77 [†]	GU981579	GU981620	KF296397	KF296434
<i>Penicillium ludwigii</i>	CBS 417.68 = FRR 559 [†]	KF296409	KF296468	KF296404	KF296435
<i>Penicillium malacosphaerulum</i>	CBS 135120 = DTO 180-E6 = DAOM 241161 [†]	FJ231026	JX091524	JX141542	KF296438

<i>Penicillium mariae-crucis</i>	CBS 271.83 = IMI 256075 ^T	GU981593	GU981630	KF296374	KF296439
<i>Penicillium marthae-christenseniae</i>	CBS 129213 = DTO 201B5 ^T	KF303651	KF303613	KF303645	KF303711
<i>Penicillium melanosporum</i>	FMR 17424 ^T	LR655192	LR655196	LR655200	LR655204
<i>Penicillium meloforme</i>	CBS 445.74 = ATCC 28049 = IMI 216903 ^T	KC411762	GU981656	KF296396	KF296440
<i>Penicillium michoacanense</i>	FMR 17612 ^T	LR655194	LR655198	LR655202	LR655206
<i>Penicillium ochrochloron</i>	CBS 357.48 = ATCC 10540 = IMI 039806 = NRRL 926 ^T	GU981604	GU981672	KF296378	KF296445
<i>Penicillium onobense</i>	CBS 174.81 = ATCC 42225 ^T	GU981575	GU981627	KF296371	KF296447
<i>Penicillium oregonense</i>	CBS 129775 = DTO 208A5 ^T	KF303668	KF303623	KF303640	KF303710
<i>Penicillium ortum</i>	CBS 135669 = DTO 180-I9 ^T	JX091427	JX091520	JX141551	KF296443
<i>Penicillium oxalicum</i>	CBS 219.30 = ATCC 1126 = FRR 787 = IMI 192332 = MUCL 29047 ^T	AF033438	KF296462	KF296367	JN121456
<i>Penicillium panissanguineum</i>	DAOMC 250562 = CBS 140989 ^T	KT887862	KT887823	KT887784	-
<i>Penicillium paraherquei</i>	CBS 338.59 = ATCC 22354 = ATCC 46903 = FRR 3454 = IFO 6234 = IMI 068220 = NRRL 3454 ^T	AF178511	KF296465	KF296372	KF296449
<i>Penicillium pedernalense</i>	CBS 140770 ^T	KU255398	KU255396	-	-
<i>Penicillium penarojense</i>	CBS 113178 = IBT 23262 ^T	GU981570	GU981646	KF296381	KF296450
<i>Penicillium piscarium</i>	CBS 362.48 = ATCC 10482 = FRR 1075 = IFO 8111 = IMI 040032 ^T	GU981600	GU981668	KF296379	KF296451
<i>Penicillium porphyreum</i>	CBS 382.64 = DTO 78G7 ^T	KF303666	KF303621	KF303636	KF303677

<i>Penicillium pulvillorum</i>	CBS 280.39 = IFO 7763 = NRRL 2026 ^T	AF178517	GU981670	KF296377	KF296452
<i>Penicillium raperi</i>	CBS 281.58 = ATCC 22355 = IFO 8179 = IMI 071625 = NRRL 2674 ^T	AF033433	GU981622	KF296399	KF296453
<i>Penicillium restrictum</i>	CBS 367.48 = ATCC 11257 = FRR 1748 = IMI 040228 = NRRL 1748 ^T	AF033457	KJ834486	KP016803	JN121506
<i>Penicillium reticulisporum</i>	CBS 122.68 = ATCC 18566 = IFO 9024 = IMI 136700 ^T	AF033437	GU981665	KF296391	KF296454
<i>Penicillium riverlandense</i>	CBS 135896 = DTO 182F6 = DAOMC 241060 ^T	JX091457	JX091580	JX141593	KF303685
<i>Penicillium rolfsii</i>	CBS 368.48 = ATCC 10491 = FRR 1078 = IFO 7735 ^T	JN617705	GU981667	KF296375	KF296455
<i>Penicillium rubriannulatum</i>	CGMCC 3.18804 = CBS 144641 ^T	KY495029	KY495138	KY494969	KY495080
<i>Penicillium setosum</i>	CBS 144865 ^T	KT852579	MF184995	MH105905	-
<i>Penicillium sexuale</i>	FMR 17380^T	LR655195	LR655199	LR655203	LR655207
<i>Penicillium siccitolerans</i>	FMR 17381^T	LR655193	LR655197	LR655201	LR655205
<i>Penicillium simplicissimum</i>	CBS 372.48 = ATCC 10495 = FRR 902 = IFO 5762 = IMI 039816 ^T	GU981588	GU981632	KF296368	JN121507
<i>Penicillium singorense</i>	CBS 138214 = DTO 133-C6 ^T	KJ775674	KJ775167	KJ775403	-
<i>Penicillium skrjabinii</i>	CBS 439.75 = NRRL 13055 = FRR 1945 = IMI 196528 ^T	GU981576	GU981626	KF296370	EU427252
<i>Penicillium annulatum</i>	CGMCC 3.18806 = CBS 144482 ^T	KY495038	KY495147	KY494978	-
<i>Penicillium soosanum</i>	CBS 140106 = IBT 30727 ^T	FJ430745	FM865811	LT970913	LT797561
<i>Penicillium spinuliferum</i>	CGMCC 3.18807 = CBS 144483 ^T	KY495040	KY495149	KY494980	KY495090
<i>Penicillium subrubescens</i>	CBS 132785 = DTO 188-D6 ^T	KC346350	KC346327	KC346330	KC346306

<i>Penicillium svalbardense</i>	CBS 122416 = IBT 23856 [†]	GU981603	KC346325	KC346338	KF296457
<i>Penicillium tanzanicum</i>	DAOMC 250514 = CBS 140968 [†]	KT887841	KT887802	KT887763	-
<i>Penicillium terrarumae</i>	CBS 131811 = DTO 174-H2 [†]	MN431397	KX650295	MN969323	MN969185
<i>Penicillium toxicarium</i>	NRRL 6172 [†]	EF198650	EF198620	EF198631	EF198499
<i>Penicillium tubakianum</i>	CBS 287.66 = DTO 138D9 = MUCL 8519 = IFO 8315 [†]	KF303652	KF303611	KF303637	KF303712
<i>Penicillium vanderhammenii</i>	CBS 126216 = IBT 23203 [†]	GU981574	GU981647	KF296382	KF296458
<i>Penicillium variratense</i>	CBS 337.97 = DTO 137C8 [†]	KF303649	KF303610	KF303630	KF303675
<i>Penicillium vasconiae</i>	CBS 339.79 = ATCC 42224 [†]	GU981599	GU981653	KF296386	KF296459
<i>Penicillium viridissimum</i>	CGMCC 3.18796 = CBS 144484 [†]	KY495004	KY495113	KY494944	KY495059
<i>Penicillium williamettense</i>	CBS 129774 = DTO 208A4 [†]	KF303667	KF303622	KF303639	KF303709
<i>Penicillium wisconsinense</i>	CBS 128279 = DTO 198H7 [†]	KF303670	KF303624	KF303641	KF303706
<i>Penicillium wollemiicola</i>	CBS 137177 = DTO 297E3 [†]	KJ174314	KJ174315	KJ174316	KJ174313
<i>Penicillium wotroi</i>	CBS 118171 = IBT 23253 [†]	GU981591	GU981637	KF296369	KF296460
<i>Penicillium yunnanense</i>	CGMCC 3.18794 = CBS 144485 [†]	KY494990	KY495099	KY494930	KY495048
<i>Penicillium zonatum</i>	CBS 992.72 = ATCC 24353 [†]	GU981581	GU981651	KF296380	KF296461

[†]**ATCC**: American Type Culture Collection, Virginia, USA; **BCCM/MUCL**: Mycothèque de l'Université catholique de Louvain, Louvain-la-Neuve, Belgium; **CBS**: Culture collection of the Westerdijk Biodiversity Institute, Utrecht, the Netherlands; **CCDCA**: Culture Collection of Microorganisms from the Department of Food Science, Brazil; **CGMCC**: China General Microbiological Culture Collection Center, Beijing, China; **DAOM**: Canadian Collection of Fungal Cultures, Ottawa, Canada; **DTO**: Applied and Industrial Mycology Department Collection, Utrecht, the Netherlands; **FRF**: Food Science Australia, Ryde; **FMR**: Facultad de Medicina, Universitat Rovira i Virgili, Reus, Spain; **IBT**: IBT Culture Collection of Fungi, Lyngby, Denmark; **IFO**: Institute for Fermentation, Osaka, Japan, now NBRC; **IMI**: International Mycological Institute, CABI-Bioscience, Egham, Bakenham Lane, U.K.; **ITAL**: Instituto de Tecnologia de Alimentos, Sao Paulo, Brazil; **KACC**: Korean Agricultural Culture Collection, Suwon, Republic of Korea; **NRRL**: ARS Culture Collection, Peoria, United States; **URM**: Universidade Federal de Pernambuco, Brazil. [†]: ex-type strain. ²Sequences newly generated in this study are indicated in **bold**. ³ITS: internal transcribed spacer region 1 & 2 including 5.8S nrDNA; *BenA*: β -tubulin; *CaM*: calmodulin; *rpb2*: partial RNA polymerase II, second largest subunit.