

Table S1. GenBank accession numbers of ITS and partial *cox1* sequences generated in this study for representative *Phytophthora*, *Elongisporangium*, *Nothophytophthora*, *Phytopythium* and *Pythium* isolates from Vietnamese forests and rivers and isolates from related *Phytophthora* species used for comparisons.

<i>Phytophthora</i> species (breeding system / mating type) ^{a, b}	Isolate	Site and location of Vietnamese isolates or source of isolates not obtained in this study ^{c, d}	GenBank accession numbers	
			ITS	<i>cox1</i>
<i>P. attenuata</i> (ho), ex-type	CBS 141199	Taiwan, Jung et al. 2017a	KU517154 ^d	KU517148 ^d
<i>P. attenuata</i>	VN114	F05, Hoàng Liên NP	MN872723	MN866073
<i>P. sp. attenuata</i> -like 1	VN062	F04, Hoàng Liên NP	MN872717	MN866067
<i>P. sp. attenuata</i> -like 2	VN031	F11, Hoàng Liên NP	MN872712	MN866063
<i>P. sp. attenuata</i> -like 3	VN624	F15, Ba Vì NP	MN872761	MN866094
<i>P. botryosa</i> (A2), ex-type	CBS586.69	Malaysia, Robideau et al. 2011	HQ643151 ^d	HQ261256 ^d
<i>P. botryosa</i> aff. (A1)	CBS235.30	Sulawesi, Robideau et al. 2011	HQ643140 ^d	HQ708214 ^d
<i>P. botryosa</i> aff. (A1)	CBS238.28	n.a., Robideau et al. 2011	HQ643139 ^d	HQ708213 ^d
<i>P. capensis</i> (ho), ex-type	P1819	South Africa, Bezuidenhout et al. 2010	GU191232 ^d	GU191275 ^d
<i>P. capensis</i> (ho)	VN079	R01, Hoàng Liên NP	MN872720	MN866070
<i>P. capensis</i> (ho)	VN974	R10, Hoàng Liên NP	MN872789	MN866108
<i>P. castaneae</i> (ho), ex-type	ICMP 19434	Japan, Weir et al. 2015	KP295319 ^d	KP295234 ^d
<i>P. castaneae</i> H1 (ho)	VN544	F15, Ba Vì NP	MN872756	MN866090
<i>P. castaneae</i> H2 (ho)	VN547	F15, Ba Vì NP	MN872757	MN866091
<i>P. castaneae</i> H3 (ho)	VN978	F14, Sau Chua mountain	MN872791	MN866110
<i>P. castaneae</i> H4 (ho)	VN054	F07, Hoàng Liên NP	MN872715	MN866065
<i>P. castaneae</i> H5 (ho)	VN233	F05, Hoàng Liên NP	MN872735	MN866083
<i>P. castaneae</i> H6 (ho)	VN069	F04, Hoàng Liên NP	MN872718	MN866068
<i>P. chlamydospora</i> (sA1), ex-type	P236 = P6133	UK, Brasier et al. 2003	AF541900 ^d	MH136867 ^d
<i>P. chlamydospora</i> (sA1)	VN090	R04, Hoàng Liên NP	MN872722	MN866072
<i>P. chlamydospora</i> (sA1)	VN939	F12, Hoàng Liên NP	MN872785	MN866106
<i>P. cinnamomi</i> (A2), ex-type	CBS 142.22	Sumatra, Jung et al. 2017a	KU899160 ^d	KU899315 ^d
<i>P. cinnamomi</i> (A2)	TW213	Taiwan, Jung et al. 2017a	KU682570 ^d	n.a.
<i>P. cinnamomi</i> H1 (A2)	VN070	F03, Hoàng Liên NP	MN872719	MN866069
<i>P. cinnamomi</i> H2 (A1)	VN058	F02, Hoàng Liên NP	MN872716	MN866066
<i>P. cinnamomi</i> H3 (A2)	VN017	F10, Hoàng Liên NP	MN872711	MN866062
<i>P. cinnamomi</i> H4 (A2)	VN007	F06, Hoàng Liên NP	MN872709	MN866061
<i>P. cinnamomi</i> H5 (A2)	VN231	F08, Hoàng Liên NP	MN872734	MN866082
<i>P. cinnamomi</i> H6 (A2)	VN450	F17, Ba Vì NP	MN872744	MN866086
<i>P. cinnamomi</i> H7 (A1)	VN533	F15, Ba Vì NP	MN872754	MN866089
<i>P. cinnamomi</i> H8 (A2)	VN555	F15, Ba Vì NP	MN872760	MN866093
<i>P. citricola</i> s.s. (ho), authentic type	CBS295.29	Japan, Scott et al. 2009, Henricot et al. 2014	FJ560913 ^d	KC855432 ^d
<i>P. citricola</i> VII (ho)	TW115	Taiwan, Jung et al. 2017a	KU682572 ^d	KU682592v
<i>P. citricola</i> VII (ho)	VN367	F13, Xin Chài mountain	MN872738	MN866085

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			ITS	<i>cox1</i>
<i>P. citricola</i> VIII (ho)	VN970	R10, Hoàng Liên NP	MN872787	MN866107
<i>P. citricola</i> IX (ho)	VN1013	R11, Sau Chua mountain	MN872793	MN866112
<i>P. citricola</i> X (ho)	VN804	F21, Cuc Phuong NP	MN872772	MN866097
<i>P. citricola</i> XI (ho)	VN1023	F25, Côn Đảo NP	MN872794	MN866113
<i>P. drechsleri</i> (n.a.), ex-type	ATCC 46724, 23J5	USA, Cooke et al. 2000, Yang et al. 2017	AF266798 ^d	MH620076 ^d
<i>P. drechsleri</i> (A1)	VN520	R15, Black River	MN872752	MN866087
<i>P. gallica</i> (sterile), ex-type	CBS 111474, GAL1	France, Jung & Nechwatal 2008	DQ286726 ^d	n.a.
<i>P. gregata</i> (ho)	VN327	F06, Hoàng Liên NP	MN872737	MN866084
<i>P. heveae</i> (ho), ex-type	CBS296.29	Malaysia, Robideau et al. 2011, Weir et al. 2015	HQ643238 ^d	KP295326 ^d
<i>P. heveae</i> H1 (ho)	VN529	F16, Ba Vì NP	MN872753	MN866088
<i>P. heveae</i> H2 (ho)	VN787	F18, Cuc Phuong NP	MN872769	MN866095
<i>P. heveae</i> H3 (ho)	VN789	F23, Bù Gia Mập NP	MN872770	MN866096
<i>P. insolita</i> (ho), ex-type	IMI288805	Taiwan, Cooke et al. 2000	AF271222 ^d	n.a.
<i>P. macrochlamydospora</i> (sterile), ex-type	P10263	Australia, n.a.	FJ801351 ^d	MH136923 ^d
<i>P. macrochlamydospora</i> (sterile)	VN1006	R11, Sau Chua mountain	MN872792	MN866111
<i>P. meadii</i> (n.a.)	P75	India, n.a.	GU993903 ^d	GU945489 ^d
<i>P. mekongensis</i> (sterile), ex- type	CBS135136	Vietnam, Cacciola et al. 2017	KC875838 ^d	KT366920 ^d
<i>P. multivesiculata</i> (ho), ex-type	CBS545.96	Netherlands, Robideau et al. 2011	HQ643288 ^d	HQ708340 ^d
<i>P. parvispora</i> (A2), ex-type	CBS 132772	Sardinia, Scanu et al. 2014	KC478667 ^d	KC609413 ^d
<i>P. parvispora</i> (sterile)	VN548	F15, Ba Vì NP	MN872758	MN866092
<i>P. pseudocryptogea</i> (A1), ex- type	CBS139749, VHS16118	Australia, Safaiefarahani et al. 2015	KP288376 ^d	KP288342 ^d
<i>P. pseudocryptogea</i> (n.a.)	VN133	R09, Muong Hoa River	MN872725	MN866074
<i>P. pseudocryptogea</i> (n.a.)	VN842	R10, Hoàng Liên NP	MN872776	MN866101
<i>P. quininea</i> (ho), ex-type	CBS407.48, P8488	Peru, Kroon et al. 2004, Robideau et al. 2011	HQ261660 ^d	AY564200 ^d HQ708386 ^d
<i>P. ramorum</i> EU1 (A1), ex-type	CBS101553	Germany, Robideau et al. 2011	HQ643339 ^d	DQ117984 ^d
<i>P. ramorum</i> EU1 (A1)	P1578	UK, this study	MN861668	MN861124
<i>P. ramorum</i> EU2 (A1)	P2460	UK, this study	MN861669	MN861125
<i>P. ramorum</i> NA1 (A2)	P1421	US, this study	MN861670	MN861126
<i>P. ramorum</i> NA2 (A2)	P2056	US, this study	MN861671	MN861127
<i>P. ramorum</i> (A1)	VN852	R10, Hoàng Liên NP	MN861672	MN861128
<i>P. ramorum</i> (A1)	VN057	R04, Hoàng Liên NP	MN861673	MN861129
<i>P. ramorum</i> (n.a.)	VN152	R03, Hoàng Liên NP	MN872730	MN866079
<i>P. ramorum</i> (A2)	VN169	R03, Hoàng Liên NP	MN861674	MN861130
<i>P. ramorum</i> (A2)	VN088	R04, Hoàng Liên NP	MN861675	MN861131
<i>P. tropicalis</i> (n.a.), ex-type	CBS434.91	Hawaii, Robideau et al. 2011	HQ643369 ^d	HQ708417 ^d

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<i>P. virginiana</i> (sA1), ex-type	46A2	USA, Yang & Hong 2013	KC295544 ^d	n.a.
<i>P. ×heterohybrida</i> (A2), ex-type	CBS 141207	Taiwan, Jung et al. 2017a	KU517151 ^d	KU517145 ^d
<i>P. ×heterohybrida</i> (A1ho)	VN081	R01, Hoàng Liên NP	MN872721	MN866071
<i>P. sp. aquatilis</i> (n.a.)	38J5	USA, n.a.	FJ666126 ^d	KF317103 ^d
<i>P. sp. bitahaiensis</i> (n.a.)	BHL1	China, Huai et al. 2013	KT183432 ^d	n.a.
<i>P. sp. bitahaiensis</i> -like (sterile)	VN892	R11, Sau Chua mountain	MN872781	MN866103
<i>P. sp. ×botryosa</i> -like (A1)	TW165	Taiwan, Jung et al. 2017a	KU723594 ^d	KU723605 ^d
<i>P. sp. botryosa</i> -like 2 (A1)	VN1028	F25, Côn Đảo NP	MN872796	MN866114
<i>P. sp. Costa Rica 5</i> (n.a.)	22_CR1-LF_7A-1	Costa Rica, n.a.	KC479200 ^d	n.a.
<i>P. sp. forestsoil</i> -like (sterile)	TW55	Taiwan, Jung et al. 2017a	KU682574 ^d	KU682593 ^d
<i>P. sp. gallica</i> -like 1 (ho)	VN913	R02, Hoàng Liên NP	MN872783	MN866105
<i>P. sp. gallica</i> -like 2 (ho)	VN859	R02, Hoàng Liên NP	MN872780	n.a.
<i>P. sp. kelmania</i> (n.a.)	P10614	USA, Robideau et al. 2011	HQ261691 ^d	HQ261438 ^d
<i>P. sp. kelmania</i> (n.a.)	VN135	R09, Muong Hoa River	MN872726	MN866075
<i>P. sp. kelmania</i> (n.a.)	VN976	R11, Sau Chua mountain	MN872790	MN866109
<i>P. sp. sylvatica</i> -like 1 (sterile)	VN896	R10, Hoàng Liên NP	MN872782	MN866104
<i>P. sp. sylvatica</i> -like 2 (sterile)	VN153	R03, Hoàng Liên NP	MN872731	MN866080
<i>P. sp. sylvatica</i> -like 3 (sterile)	VN222	R08, Hoàng Liên NP	MN872732	MN866081
<i>P. sp. Grenada 3</i> (n.a.)	G148	Grenada, n.a.	KC479208 ^d	n.a.
<i>P. sp. ×Grenada 3</i> -like (sA1)	VN513	R13, Vân Hòa, Ba Vì	MN872750	n.a.
<i>P. sp. ×insolita</i> -like (ho)	TW372	Taiwan, Jung et al. 2017a	KU682601 ^d	KU682610 ^d
<i>P. sp. ×insolita</i> -like (ho)	VN515	R13, Vân Hòa, Ba Vì	MN872751	n.a.
<i>P. sp. Kunnunara</i> (n.a.)	n.a.	Australia, Oh et al. 2013	EF437222 ^d	n.a.
<i>P. sp. ×Kunnunara</i> -like (sA1)	TW373	Taiwan, Jung et al. 2017a	KU682603 ^d	KU682612 ^d
<i>P. sp. ×Kunnunara</i> -like (sA1)	TW338	Taiwan, Jung et al. 2017a	KU682602 ^d	KU682611 ^d
<i>P. sp. ×Kunnunara</i> -like (sA1)	VN137	R12, Red River	MN872728	MN866077
<i>P. sp. ×Kunnunara</i> -like (sA1)	VN554	R14, Vân Hòa, Ba Vì	MN872759	n.a.
<i>P. sp. meadii</i> -like 1 (A1)	VN826	F13, Xin Chài mountain	MN872774	MN866099
<i>P. sp. meadii</i> -like 2 (A1)	VN810	F20, Cuc Phuong NP	MN872773	MN866098
<i>P. sp. ×meadii</i> -like (A1)	TW158	Taiwan, Jung et al. 2017a	KU682585 ^d	KU682599 ^d
<i>P. sp. multivesiculata</i> -like 1 (ho)	VN035	F06, Hoàng Liên NP	MN872713	MN866064
<i>P. sp. Peru 4</i> (n.a.)	P2	Peru, n.a.	KC479209 ^d	n.a.
<i>P. sp. ×Peru 4</i> -like (sterile)	VN136	R12, Red River	MN872727	MN866076
<i>P. sp. ×Peru 4</i> -like (sterile)	VN476	R14, Vân Hòa, Ba Vì	MN872746	n.a.
<i>P. sp. quininea</i> -like (ho)	VN847	R10, Hoàng Liên NP	MN872778	MN866102
<i>P. sp. tropicalis</i> -like 2 (n.a.)	VN830	F13, Xin Chài mountain	MN872775	MN866100
<i>P. sp. ×virginiana</i> -like 1 (sA1)	TW340	R07, Hou-long River	KU682604 ^d	KU682613 ^d
<i>P. sp. ×virginiana</i> -like 2 (sA1)	TW348	R08, Xiao-keng River	KU682606 ^d	KU682615 ^d
<i>P. sp. ×virginiana</i> -like 3 (sA1)	TW134	R18, Xiao-Qingshui Creek	KU682608 ^d	KU682617 ^d
<i>P. sp. ×virginiana</i> -like s.l. (sA1)	VN138	R12, Red River	MN872729	MN866078

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<i>P. sp.</i> ×virginiana-like s.l. (sA1)	VN489	R13, Vân Hòa, Ba Vì	MN872749	n.a.
<i>Elongisporangium sp.</i> Hoàng Liên	VN117	R01, Hoàng Liên NP	MN872724	n.a.
<i>Nothophytophthora vietnamensis</i> (ho), ex-type	CBS 142359	F04, Jung et al. 2017d	KY788421	KY788509
<i>Phytophthium vexans</i> H1	VN471	F15, Ba Vì NP	MN872745	n.a.
<i>Ph. vexans</i> H4	VN415	F17, Ba Vì NP	MN872740	n.a.
<i>Ph. vexans</i> H5	VN484	F16, Ba Vì NP	MN872747	n.a.
<i>Ph. vexans</i> H6	VN015	F13, Xin Chài mountain	MN872710	n.a.
<i>Ph. vexans</i> H7	VN791	F20, Cuc Phuong NP	MN872771	n.a.
<i>Ph. vexans</i> H8	VN655	F22, Cuc Phuong NP	MN872764	n.a.
<i>Ph. vexans</i> H9	VN052	F08, Hoàng Liên NP	MN872714	n.a.
<i>Ph. vexans</i> H10	VN649	F19, Cuc Phuong NP	MN872762	n.a.
<i>Ph. vexans</i> H11	VN715	F18, Cuc Phuong NP	MN872767	n.a.
<i>Ph. vexans</i> H12	VN486	F16, Ba Vì NP	MN872748	n.a.
<i>Ph. vexans</i> H13	VN654	F22, Cuc Phuong NP	MN872763	n.a.
<i>Ph. vexans</i> H14	VN440	F16, Ba Vì NP	MN872743	n.a.
<i>Ph. vexans</i> H15	VN418	F17, Ba Vì NP	MN872741	n.a.
<i>Ph. vexans</i> H16	VN972	R10, Hoàng Liên NP	MN872788	n.a.
<i>Ph. chamaeophyon</i>	VN705	F21, Cuc Phuong NP	MN872766	n.a.
<i>Ph. cucurbitacearum</i>	VN1038	F24, U Minh NP	MN872798	n.a.
<i>Ph. litorale</i>	VN843	R10, Hoàng Liên NP	MN872777	n.a.
<i>Ph. palingenes</i>	VN429	R16, Yên Bái, Ba Vì	MN872742	n.a.
<i>Ph. sp.</i> 1 PB-2013	VN403	R06, Hoàng Liên NP	MN872739	n.a.
<i>Ph. sp.</i> UZ248	VN1026	F25, Côn Đảo NP	MN872795	n.a.
<i>Ph. sp.</i> Côn Đảo	VN1035	F25, Côn Đảo NP	MN872797	n.a.
<i>Pythium intermedium</i>	VN660	F19, Cuc Phuong NP	MN872765	n.a.
<i>Py. senticosum</i>	VN251	F04, Hoàng Liên NP	MN872736	n.a.
<i>Py. sp.</i> conidiophorum-like	VN756	F22, Cuc Phuong NP	MN872768	n.a.
<i>Py. sp.</i> CAL_2011f	VN949	R10, Hoàng Liên NP	MN872786	n.a.
<i>Py. sp.</i> 1_MNS-2013	VN851a	R11, Sau Chua mountain	MN872779	n.a.
<i>Py. sp.</i> 2_ROH-2015	VN540	R15, Black River	MN872755	n.a.
<i>Py. sp.</i> ZSF0056	VN919	R02, Hoàng Liên NP	MN872784	n.a.
<i>Py. sp.</i> ×ZSF0056-like	VN224	R06, Hoàng Liên NP	MN872733	n.a.

^a H = *cox1* haplotypes.

^b ho = homothallic; mating types of heterothallic species: A1, A2, sA1 = silent A1.

^c For information on sites see Tables 1 and 2.

^d Sequence not generated in this study.

n.a. = not available