

Table S1 Voucher information and GenBank accession numbers of samples used in this study.

Taxa	Voucher	Locality	nrLSU	ITS	<i>rpb2</i>	<i>efl-α</i>	β - <i>tubulin</i>
Ingroup							
<i>A. bisporigera</i>	RET 377-9 (duplicate HKAS77811)	Great Smoky Mountains National Park, Tennessee, USA	KJ466434	KJ466374	---	KJ481936	KJ466501
<i>A. exitialis</i>	HKAS74673	Kunming, Yunnan, China	KJ466435	KJ466375	KJ466590	KJ481937	KJ466502
<i>A. exitialis</i>	HKAS75774	Baiyunshan, Guangdong, China	JX998052	JX998027	KJ466591	JX998001	KJ466503
<i>A. exitialis</i>	HKAS75775	Fenghuangshan, Guangdong, China	JX998053	JX998026	KJ466592	JX998002	KJ466504
<i>A. exitialis</i>	HKAS75776	Guangzhou, Guangdong, China	JX998051	JX998025	KJ466593	JX998003	KJ466505
<i>A. fuliginea</i>	HKAS75780	Fengkai, Guangdong, China	JX998048	JX998023	KJ466595	JX997995	KJ466507
<i>A. fuliginea</i>	HKAS75781	Fengkai, Guangdong, China	JX998050	JX998021	KJ466596	JX997994	KJ466508
<i>A. fuliginea</i>	HKAS75782	Fengkai, Guangdong, China	JX998049	JX998022	KJ466597	JX997996	KJ466509
<i>A. fuliginea</i>	HKAS77132	Fuzhou, Jiangxi, China	KJ466436	KJ466375	KJ466598	KJ481939	KJ466510
<i>A. fuliginea</i>	HKAS79685	Hunan, China	KJ466437	KJ466376	KJ466594	KJ481938	KJ466506
<i>A. fuligineoides</i>	HKAS52727	Hunan, China	JX998047	JX998024	KJ466599	---	KJ466511
<i>A. ocreata</i>	HKAS79686	Contra Costa County, California, USA	KJ466442	KJ466381	KJ466607	KJ481947	KJ466518
<i>A. pallidorozea</i>	HKAS77327	Daoxian, Guizhou, China	KJ466446	KJ466386	KJ466608	KJ481948	KJ466519
<i>A. pallidorozea</i>	HKAS61937	Taibai Mountain, Shaanxi, China	KJ466443	KJ466382	KJ466609	KJ481949	KJ466520
<i>A. pallidorozea</i>	HKAS71023	Hokkaido, Japan	KJ466444	KJ466383	KJ466624	KJ481960	KJ466536
<i>A. pallidorozea</i>	HKAS75483	Shennongjia, Hubei, China	KJ466445	KJ466384	KJ466623	KJ481959	KJ466535
<i>A. pallidorozea</i>	HKAS75783	Nujiang, Yunnan, China	JX998055	JX998035	KJ466625	JX998010	KJ466537
<i>A. pallidorozea</i>	HKAS75784	Neixiang, Hennan, China	JX998056	JX998036	KJ466626	JX998009	KJ466538
<i>A. pallidorozea</i>	HKAS75786	Tianshui, Gansu, China	JX998054	JX998037	KJ466627	JX998011	KJ466539
<i>A. pallidorozea</i>	HKAS77329	Daoxian, Guizhou, China	KJ466447	KJ466387	KJ466610	KJ481950	KJ466521
<i>A. pallidorozea</i>	HKAS77348	Hunan, China	KJ466448	KJ466387	KJ466611	KJ481951	KJ466522
<i>A. pallidorozea</i>	HKAS77349	Mount Tai, Shandong, China	KJ466449	KJ466389	KJ466628	KJ481961	KJ466540
<i>A. phalloides</i>	HKAS75773	California, USA	JX998060	JX998031	KJ466612	JX998000	KJ466523

<i>A. rimosa</i>	HKAS75777	Baisha, Hainan, China	JX998044	JX998018	KJ466615	JX998005	KJ466526
<i>A. rimosa</i>	HKAS75778	Qiongzong, Hainan, China	JX998045	JX998019	KJ466616	JX998006	KJ466527
<i>A. rimosa</i>	HKAS75779	Chebaling, Guangdong, China	JX998046	JX998020	KJ466617	JX998004	KJ466528
<i>A. rimosa</i>	HKAS77105	Fuzhou, Jiangxi, China	KJ466452	KJ466391	KJ466618	KJ481954	KJ466529
<i>A. rimosa</i>	HKAS77120	Fuzhou, Jiangxi, China	KJ466453	KF479044	KJ466619	KJ481955	KJ466530
<i>A. rimosa</i>	HKAS77279	Fengkai, Guangdong, China	KJ466454	KJ466392	KJ466620	KJ481956	KJ466531
<i>A. rimosa</i>	HKAS77335	Qiongzong, Hainan, China	KJ466455	KJ466393	KJ466621	KJ481957	KJ466532
<i>A. rimosa</i>	HKAS77336	Zhaoqing, Guangdong, China	KJ466456	KJ466394	KJ466622	KJ481958	KJ466533
<i>A. sp. 1</i>	RET 327-10 (duplicate HKAS77812)	Newfoundland and Labrador, Canada	KJ466458	KJ466396	KJ466629	KJ481962	KJ466541
<i>A. sp. 1</i>	RET 368-8 (duplicate HKAS77813)	Newfoundland and Labrador, Canada	KJ466459	KJ466397	---	KJ481963	KJ466542
<i>A. sp. 1</i>	RET 397-8 (duplicate HKAS77814)	Belleplain State Forest, New Jersey, USA	KJ466460	KJ466398	---	KJ481964	KJ466543
<i>A. sp. 1</i>	RET 480-1 (duplicate HKAS77817)	Franklin County, New York, USA	KJ466461	KJ466399	KJ466630	KJ481965	KJ466544
<i>A. sp. 2</i>	HKAS77350	Taiwan, China	KJ466462	KJ466400	KJ466631	KJ481966	KJ466545
<i>A. sp. 3</i>	HKAS77342	Fengkai, Guangdong, China	KJ466463	KF479045	KJ466632	KJ481967	KJ466546
<i>A. sp. 3</i>	HKAS77343	Fengkai, Guangdong, China	KJ466464	KJ466401	KJ466633	KJ481968	KJ466547
<i>A. sp. 3</i>	HKAS77344	Fengkai, Guangdong, China	KJ466465	KJ466402	KJ466634	KJ481969	KJ466548
<i>A. sp. 3</i>	HKAS77351	Taiwan, China	KJ466466	KJ466403	KJ466635	KJ481970	KJ466549
<i>A. sp. 4</i>	HKAS77326	Fengkai, Guangdong, China	KJ466467	KJ466404	KJ466636	KJ481971	KJ466550
<i>A. sp. 4</i>	HKAS77347	Lechang, Guangdong, China	KJ466468	KJ466405	KJ466637	KJ481972	KJ466551
<i>A. sp. 5</i>	RET 422-8 (duplicate HKAS77816)	Somerset County, New Jersey, USA	KJ466469	KJ466406	KJ466649	KJ481983	KJ466563
<i>A. sp. 5</i>	RET 493-6 (duplicate HKAS77822)	Columbiana County, Ohio, USA	KJ466470	KJ466407	KJ466650	KJ481984	KJ466564
<i>A. sp. 6</i>	HKAS75555	Shennongjia, Hubei, China	KJ466471	KJ466408	KJ466638	KJ481973	KJ466552

<i>A. sp. 6</i>	HKAS77324	Taibai Mountain, Shaanxi, China	KJ466472	KJ466409	KJ466639	KJ481974	KJ466553
<i>A. sp. 6</i>	HMJAU20469	Changbai Mountain, Jilin, China	KJ466473	KJ466410	KJ466640	KJ481975	KJ466554
<i>A. sp. 7</i>	HKAS77332	Qiongzong, Hainan, China	KJ466474	KJ466411	---	KJ481992	KJ466578
<i>A. sp. 7</i>	HKAS77333	Baisha, Hainan, China	KJ466475	KJ466412	KJ466660	KJ481993	KJ466579
<i>A. sp. 7</i>	HKAS77334	Lingshui, Hainan, China	KJ466476	KJ466413	KJ466661	KJ481994	KJ466580
<i>A. sp. 8</i>	HKAS75150	Gazipur, Bangladesh	KJ466477	KJ466414	KJ466641	KJ481976	KJ466555
<i>A. sp. 9</i>	HKAS77323	Fuzhou, Jiangxi, China	KJ466478	KJ466415	KJ466642	KJ481977	KJ466556
<i>A. sp. 10</i>	HKAS77322	Tasmania, Australia	KJ466457	KJ466395	KJ466643	KJ481978	KJ466557
<i>A. suballiacea</i>	RET 478-6 (duplicate HKAS77819)	Clarion County, Pennsylvania, USA	KJ466484	KJ466419	KJ466600	KJ481940	KJ466512
<i>A. suballiacea</i>	RET 490-1 (duplicate HKAS77820)	Middlesex County, Connecticut, USA	KJ466485	KJ466420	KJ466601	KJ481941	KJ466513
<i>A. suballiacea</i>	RET 491-7 (duplicate HKAS77821)	Macomb County, Michigan, USA	KJ466486	KJ466421	KJ466602	KJ481942	KJ466514
<i>A. subjunquillea</i>	HKAS54509	Kunming, Yunnan, China	KJ466487	KJ466422	---	KJ481985	KJ466568
<i>A. subjunquillea</i>	HKAS63418	Changbai Mountain, Jilin, China	KJ466488	KJ466423	KJ466651	KJ481986	KJ466569
<i>A. subjunquillea</i>	HKAS74993	Nujiang, Yunnan, China	KJ466489	KJ466424	KJ466652	KJ481987	KJ466570
<i>A. subjunquillea</i>	HKAS75770	Taibai Mountain, Shaanxi, China	JX998062	JX998034	KJ466653	JX997999	KJ466571
<i>A. subjunquillea</i>	HKAS75771	Shennongjia, Hubei, China	JX998063	JX998032	KJ466654	JX997997	KJ466572
<i>A. subjunquillea</i>	HKAS75772	Tianshui, Gansu, China	JX998061	JX998033	KJ466655	JX997998	KJ466573
<i>A. subjunquillea</i>	HKAS77325	Neixiang, Henan, China	KJ466490	KJ466425	KJ466656	KJ481988	KJ466574
<i>A. subjunquillea</i>	HKAS77345	Shiyan, Hubei, China	KJ466491	KJ466426	KJ466657	KJ481989	KJ466575
<i>A. subjunquillea</i>	HMJAU20412	Changbai Mountain, Jilin, China	KJ466492	KJ466427	KJ466658	KJ481990	KJ466576
<i>A. subjunquillea</i>	HMJAU23276	Helong, Jilin, China	KJ466493	KJ466428	KJ466659	KJ481991	KJ466577
<i>A. virosa</i>	HKAS56694	Juva, Finland	JX998058	JX998030	KJ466664	JX998007	KJ466583
<i>A. virosa</i>	HKAS71040	Hokkaido, Japan	KJ466496	KJ466429	KJ466665	KJ481997	KJ466584
<i>A. virosa</i>	HMJAU20396	Changbai Mountain, Jilin, China	JX998059	JX998029	---	JX998008	KJ466585
<i>A. virosa</i>	HMJAU23303	Fusong, Jilin, China	KJ466497	KJ466430	KJ466666	KJ481998	KJ466586

<i>A. virosa</i>	HMJAU23304	Fusong, Jilin, China	KJ466498	KJ466431	KJ466667	KJ481999	KJ466587
Outgroup							
<i>A. aff. fritillaria</i>	HKAS56832	Baoshan, Yunnan, China	KJ466479	KJ466372	KJ466644	KJ481979	KJ466558
<i>A. aff. fritillaria</i>	HKAS57649	Dali, Yunnan, China	KJ466480	KJ466373	KJ466645	KJ481980	KJ466559
<i>A. manginiana</i>	HKAS56933	Dali, Yunnan, China	KJ466438	KJ466378	KJ466603	KJ481943	KJ466515
<i>A. modesta</i>	HKAS75405	Fengkia, Guangdong, China	KJ466439	KJ466379	KJ466604	KJ481945	KJ466517
<i>A. modesta</i>	HKAS79688	Fengkia, Guangdong, China	KJ466440	---	KJ466605	KJ481944	KJ466516
<i>A. oberwinklerana</i>	HKAS77330	Hainan, China	KJ466441	KJ466380	KJ466606	KJ481946	
<i>A. aff. parvipantherina</i>	HKAS56822	Baoshan, Yunnan, China	JN941163	JN943170	JQ031115	KJ482005	KJ466566
<i>A. pseudoporphyrina</i>	HKAS56984	Dali, Yunnan, China	KJ466450	KC429050	KJ466614	KJ481953	KJ466525
<i>A. pseudoporphyrina</i>	HKAS57356	Baoshan, Yunnan, China	KJ466451	---	KJ466613	KJ481952	KJ466524
<i>A. rubrovolvata</i>	HKAS56744	Yingjiang, Yunnan, China	JN943181	JN943181	JQ031117	KJ482002	KJ466534
<i>A. sp.</i>	HKAS77321	Kunming, Yunnan, China	KJ466481	KJ466416	KJ466646	---	KJ466560
<i>A. sp.</i>	HKAS77339	Inchon, South Korea	KJ466482	KJ466417	KJ466647	KJ481981	KJ466561
<i>A. sp.</i>	HKAS77340	Jiujiang, Jiangxi, China	KJ466483	KJ466418	KJ466648	KJ481982	KJ466562
<i>A. subfrostiana</i>	HKAS57042	Dali, Yunnan, China	JN941162	JN943173	JQ031118	KJ482003	KJ466565
<i>A. subglobosa</i>	HKAS58837	Lijiang, Yunnan, China	JN941152	JN943177	JQ031121	KJ482004	KJ466567
<i>A. vestita</i>	HKAS79687	Hainan, China	KJ466494	---	KJ466662	KJ481995	KJ466581
<i>A. virgineoides</i>	HKAS79691	Qingdao, Shandong, China	KJ466495	---	KJ466663	KJ481996	KJ466582
<i>A. zangii</i>	GDGM29241	Fujian, China	KJ466499	KJ466432	KJ466668	KJ482000	KJ466588
<i>A. zangii</i>	HKAS77331	Hainan, China	KJ466500	KJ466433	KJ466669	KJ482001	KJ466589