Table S1 Taxa information and GenBank accession numbers for sequences used in the molecular phylogeny of Amanitaceae.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *Taxon* | voucher | locality | GenBank accession number | | | | |
| LSU | ITS | *rpb*2 | *tef1-α* | *β-tubulin* |
| *A.* aff. *brunneofuliginea* | HKAS96170 | Austria | MH486361 | MH508249 | MH485858 | MH508664 | MH485396 |
| *A.* aff. *brunneofuliginea* | HKAS96171 | Austria | MH486362 | MH508250 | MH485859 | MH508665 | MH485397 |
| *A.* aff. *brunneofuliginea* | HKAS96174 | Austria | MH486363 | MH508251 | MH485860 | MH508666 | MH485398 |
| *A. altipes* | HKAS58805 | Shangri-La, Yunnan, China | JN941158 | JN943175 | JQ031112 | KR824810 | MH485399 |
| *A. altipes* | HKAS58890 | Yulong, Yunnan, China | JN941159 | JN943174 | KR824801 | KR824811 | MH485400 |
| *A. altipes* | HKAS91125 | Ganzi, Sichuan, China | MH486367 | MH508254 | MH485862 | MH508669 | MH485401 |
| *A. aspericeps* | HKAS100519 | Mount Wuyi, Fujian, China | MH486369 | MH508255 | MH485864 | MH508671 | MH485403 |
| *A. aspericeps* | HKAS80014 | Ailaoshan, Yunnan, China | MH486374 | MH508257 | MH485868 | MH508676 | MH485408 |
| *A. avellaneosquamosa* | HKAS77339 | Incheon's Central park, South Korea | KJ466482 | KJ466417 | KJ466647 | KJ481981 | KJ466561 |
| *A. avellaneosquamosa* | HKAS77340 | Lushan, Jiangxi, China | KJ466483 | KJ466418 | KJ466648 | KJ481982 | KJ466562 |
| *A. battarrae* | HKAS57229 | Changdu, Tibet, China | MH486383 | MH508262 | MH485875 | MH508684 | MH485412 |
| *A. battarrae* | HKAS92083 | Changbai mountain, Jilin, China | MH486387 | MH508265 | MH485879 | MH508688 | MH485416 |
| *A. battarrae* | MB-000643 (duplicate HKAS84849) | Germany | MH486389 | MH508267 | MH485881 | MH508690 | MH485417 |
| *A. brunneofuliginea* | HKAS83536 | Aba, Sichuan, China | MH486392 | MH508268 | MH485884 | MH508692 | MH485420 |
| *A. brunneofuliginea* | HKAS89226 | Daofu, Sichuan, China | MH486393 | MH508269 | MH485885 | MH508693 | MH485421 |
| *A. brunneofuliginea* | HKAS92078 | Changbai mountain, Jilin, China | MH486394 | MH508270 | MH485886 | MH508694 | MH485422 |
| *A. brunneomaculata* | HKAS68393 | Lijiang, Yunnan, China | MH486410 | MH508278 | MH485892 | MH508698 | MH485428 |
| *A. caojizong* | HKAS100503 | Xundian, Kunming, Yunnan | MH486423 | MH508287 | MH485903 | MH508710 | MH485432 |
| *A. caojizong* | HKAS56933 | Nanjian, Yunnan, China | KJ466438 | KJ466378 | KJ466603 | KJ481943 | KJ466515 |
| *A. caojizong* | HKAS69717 | Yulong, Yunnan, China | MH486425 | MH508288 | MH485905 | MH508712 | MH485433 |
| *A.* cf. *angustilamellata* | HKAS89451 | Mount Taishan, Shandong, China | MH486431 | MH508292 | MH485910 | MH508716 | MH485436 |
| *A.* cf. *incarnatifolia* | HKAS100579 | Jinzhai, Anhui, China | MH486432 | MH508293 | MH485911 | MH508717 | MH485437 |
| *A.* cf. *incarnatifolia* | HKAS100633 | Jinzhai, Anhui, China | MH486433 | MH508294 | MH485912 | MH508718 | MH485438 |
| *A.* cf. *incarnatifolia* | HKAS92048 | Huanren, Liaoning, China | MH486435 | MH508296 | MH485914 | MH508719 | MH485440 |
| *A.* cf. *xanthogala* | HKAS84707 | Menghai, Yunnan, China | MH486441 | MH508298 | MH485918 | MH508723 | MH485443 |
| *A. changtuia* | HKAS92105 | Mudanjiang, Heilongjiang, China | MH486443 | MH508300 | MH485920 | MH508725 | MH485444 |
| *A. chiui* | HKAS54613 | Ailaoshan, Yunnan, China | MH486444 | MH508301 | MH485921 | MH508726 | MH485445 |
| *A. chiui* | HKAS76328 | Yanyuan, Sichuan, China | MH486447 | MH508303 | MH485930 | MH508727 | MH485453 |
| *A. cinereopannosa* | RET 477-10 | USA | MH486450 | MH508306 | MH485932 | MH508728 | MH485457 |
| *A. cinereoradicata* | HKAS101435 | Yunnan, China | MH486451 | MH508307 | MH485933 | MH508729 | MH485458 |
| *A. cinereoradicata* | HKAS69389 | Ninglang, Yunnan, China | MH486453 | MH508308 | MH485934 | MH508730 | MH485459 |
| *A. citrina* | HKAS101397 | France | MH486456 | MH508311 | MH485936 | MH508732 | MH485460 |
| *A. citrina* | HKAS53467 | Germnay | MH486457 | MH508312 | MH485937 | MH508733 | MH485461 |
| *A. citrinoannulata* | HKAS100523 | Lianyungang, Jiangsu, China | MH486458 | MH508313 | MH485938 | MH508734 | MH485462 |
| *A. citrinoannulata* | HKAS100524 | Qingdao, Shandong, China | MH486459 | MH508314 | MH485939 | MH508735 | MH485463 |
| *A. citrinoannulata* | HKAS56865 | Baoshan, Yunnan, China | MH486461 | MH508315 | MH485941 | MH508737 | MH485465 |
| *A. citrinoindusiata* | HKAS100522 | Lijiang, Yunnan, China | MH486468 | MH508320 | MH485947 | MH508744 | MH485470 |
| *A. citrinoindusiata* | HKAS58796 | Shangri-La, Yunnan, China | MH486469 | MH508321 | MH485948 | MH508745 | MH485471 |
| *A. citrinoindusiata* | HKAS58884 | Yulong, Yunnan, China | MH486471 | MH508323 | MH485950 | MH508747 | MH485473 |
| *A. concentrica* | HKAS84675 | Xishuangbanna, Yunnan, China | MH486474 | MH508326 | MH485953 | MH508749 | MH485476 |
| *A. concentrica* | HKAS87061 | Xishuangbanna, Yunnan, China | KR824785 | MH508327 | KR824794 | KR824827 | MH485477 |
| *A. detersa* | HKAS71476 | Lushui, Yunnan, China | MH486475 | MH508328 | MH485954 | MH508752 | MH485479 |
| *A. detersa* | HKAS74828 | Lushui, Yunnan, China | MH486476 | MH508329 | MH485955 | MH508753 | MH485480 |
| *A. detersa* | HKAS83720 | Ailaoshan, Yunnan, China | MH486479 | MH508332 | MH485958 | MH508756 | MH485482 |
| *A. eijii* | HKAS70229 | Ninglang, Yunnan, China | MH486484 | MH508333 | MH485963 | MH508761 | MH485486 |
| *A. elata* | HKAS83449 | Xishuangbanna, Yunnan, China | MH486486 | MH508334 | MH485965 | MH508763 | MH485488 |
| *A. elliptica* | HKAS96797 | Wuzhishan, Hainan, China | MH486488 | MH508336 | MH485966 | MH508765 | MH485490 |
| *A. esculenta* | HKAS89035 | Xishuangbanna, Yunnan, China | MH486490 | MH508338 | MH485968 | MH508767 | MH485491 |
| *A. exitialis* | HKAS74673 | Kunming, Yunnan, China | KJ466435 | KJ466375 | KJ466590 | KJ481937 | KJ466502 |
| *A. exitialis* | HKAS75774 | Baiyun Mountain, Guangdong, China | JX998052 | JX998027 | KJ466591 | JX998001 | KJ466503 |
| *A. exitialis* | HKAS75775 | Guangzhou, Guangdong, China | JX998053 | JX998026 | KJ466592 | JX998002 | KJ466504 |
| *A. farinosa* | HKAS100490 | Zhangping, Fujian, China | MH486495 | MH508339 | MH485970 | MH508769 | MH485493 |
| *A. farinosa* | HKAS100578 | Jinzhai, Anhui, China | MH486496 | MH508340 | MH485971 | MH508770 | MH485494 |
| *A. farinosa* | HKAS56816 | Baoshan, Yunnan, China | JN941154 | JN943180 | JQ031110 | MH508772 | MH485496 |
| *A. flavipes* | HKAS56824 | Baoshan, Yunnan, China | MH486500 | MH508342 | MH485974 | MH508775 | MH485499 |
| *A. flavipes* | HKAS87944 | Shangri-La, Yunnan, China | MH486507 | MH508344 | MH485979 | MH508783 | MH485504 |
| *A. flavipes* | HKAS91158 | Yadong, Tibet, China | MH486510 | MH508347 | MH485982 | MH508786 | MH485506 |
| *A. flavofloccosa* | HKAS90174 | Nanjian, Yunnan, China | KT833801 | MH508352 | KT833818 | KT833831 | MH485508 |
| *A. flavopantherina* | HKAS51045 | Docheng, Sichuan, China | MH486517 | MH508353 | MH485988 | MH508793 | MH485510 |
| *A. flavopantherina* | HKAS82613 | Shangri-La, Yunnan, China | MH486519 | MH508355 | MH485989 | MH508795 | MH485512 |
| *A. franzii* | HKAS77321 | Kunming, Yunnan, China | KJ466481 | MH508357 | KJ466646 | MH508798 | KJ466560 |
| *A. franzii* | HKAS91231 | Kunming, Yunnan, China | MH486525 | MH508358 | MH485994 | MH508801 | MH485516 |
| *A. fritillaria* | HKAS100520 | Fujan, China | MH486527 | MH508359 | MH485995 | MH508802 | MH485517 |
| *A. fritillaria* | HKAS100521 | Lushan, Jiangxi, China | MH486528 | MH508360 | MH485996 | MH508803 | MH485518 |
| *A. fritillaria* | HKAS100598 | Jinzhai, Anhui, China | MH486529 | MH508361 | MH485997 | MH508804 | MH485519 |
| *A. fuliginea* | HKAS100628 | Jinzhai, Anhui, China | MH486551 | MH508369 | MH486018 | MH508822 | MH485538 |
| *A. fuliginea* | HKAS75780 | Heishiding, Guangdong, China | JX998048 | JX998023 | KJ466595 | JX997995 | KJ466507 |
| *A. fuliginea* | HKAS77132 | Fuzhou, Jiangxi, China | KJ466436 | KJ466376 | KJ466598 | KJ481939 | KJ466510 |
| *A. fulva* | HKAS101420 | France | MH486554 | MH508370 | MH486021 | MH508825 | MH485541 |
| *A. fulva* | HKAS96168 | Austria | MH486555 | MH508371 | MH486022 | MH508826 | MH485542 |
| *A. fuscoflava* | HKAS59800 | Limushan, Hainan, China | MH486557 | MH508372 | MH486023 | MH508827 | MH485543 |
| *A. griseofolia* | HKAS96928 | Lancang, Yunnan, China | MH486567 | MH508379 | MH486032 | MH508837 | MH485550 |
| *A. griseopantheirna* | HKAS79953 | Dege, Sichuan, China | MH486570 | MH508382 | MH486034 | MH508839 | MH485553 |
| *A. griseopantheirna* | HKAS82340 | Aba, Sichuan, China | MH486571 | MH508383 | MH486035 | MH508840 | MH485554 |
| *A. griseopantheirna* | HKAS83578 | Bomi, Tibet, China | MH486574 | MH508386 | MH486037 | MH508843 | MH485557 |
| *A. griseoumbonata* | HKAS75594 | Yichang, Hubei, China | MH486577 | MH508388 | MH486039 | MH508846 | MH485559 |
| *A. griseoverrucosa* | HKAS100613 | Jinzhai, Anhui, China | MH486579 | MH508390 | MH486041 | MH508848 | MH485560 |
| *A. griseoverrucosa* | HKAS57357 | Baoshan, Yunnan, China | MH486581 | MH508392 | MH486043 | MH508850 | MH485562 |
| *A. hamadae* | HKAS83451 | Fujan, China | MH486586 | MH508395 | MH486048 | MH508853 | MH485566 |
| *A. heishidingensis* | HKAS81484 | Heishiding, Guangdong, China | KJ922993 | KJ922999 | MH486049 | MH508854 | MH485567 |
| *A. hunanensis* | HKAS100632 | Jinzhai, Anhui, China | MH486588 | MH508396 | MH486050 | MH508856 | MH485569 |
| *A. imazekii* | HKAS71045 | Tomakomai, Hokkaido, Japan | MH486591 | MH508397 | MH486052 | MH508859 | MH485571 |
| *A. imazekii* | HKAS92011 | Benxi, Liaoning, China | MH486592 | MH508398 | MH486053 | MH508860 | MH485572 |
| *A. incarnatifolia* | HKAS100583 | Jinzhai, Anhui, China | MH486593 | MH508399 | MH486055 | MH508861 | MH485574 |
| *A. incarnatifolia* | HKAS100593 | Jinzhai, Anhui, China | MH486594 | MH508400 | MH486056 | MH508862 | MH485575 |
| *A. incarnatifolia* | HKAS100594 | Jinzhai, Anhui, China | MH486595 | MH508401 | MH486057 | MH508863 | MH485576 |
| *A. lanigera* | HKAS75018 | Lanping, Yunnan, China | MH486620 | MH508419 | MH486073 | MH508879 | MH485590 |
| *A. liquii* | HKAS58800 | Shangri-La, Yunnan, China | MH486626 | MH508425 | MH486076 | MH508884 | MH485592 |
| *A. liquii* | HKAS58885 | Yulong, Yunnan, China | MH486627 | MH508426 | MH486077 | MH508885 | MH485593 |
| *A. liquii* | HKAS93915 | Shangri-La, Yunnan, China | MH486628 | MH508427 | MH486078 | MH508886 | MH485594 |
| *A. longistriata* | HKAS68331 | Lanping, Yunnan, China | MH486631 | MH508428 | MH486081 | MH508888 | MH485595 |
| *A. melleialba* | HKAS83216 | Changsha, Hunan, China | KR824766 | MH508429 | KR824791 | KR824812 | MH485602 |
| *A. melleialba* | HKAS83446 | Puer, Yunnan, China | KR824767 | MH508430 | KR824792 | KR824813 | MH485603 |
| *A. melleialba* | HKAS87085 | Puer, Yunnan, China | KR824768 | MH508431 | KR824793 | KR824814 | MH485604 |
| *A. melleiceps* | HKAS80145 | Macheng, Hubei, China | MH486640 | MH508432 | MH486089 | MH508897 | MH485605 |
| *A. melleiceps* | HKAS80184 | Xinyang, Henan, China | MH486641 | MH508433 | MH486090 | MH508898 | MH485606 |
| *A. modesta* | HKAS100505 | Heishiding, Guangdong, China | MH486647 | MH508438 | MH486098 | MH508904 | MH485613 |
| *A. molliuscula* | HKAS75555 | Shennongjia, Hubei, China | KJ466471 | KJ466408 | KJ466638 | KJ481973 | KJ466552 |
| *A. molliuscula* | HKAS77324 | Zhouzhi, Shaanxi, China | KJ466472 | KJ466409 | KJ466639 | KJ481974 | KJ466553 |
| *A. molliuscula* | HMJAU20469 | Changbai mountain,Jilin, China | KJ466473 | KJ466410 | KJ466640 | KJ481975 | KJ466554 |
| *A. muscaria* | HKAS61888 | HuZhong, Heilongjiang, China | MH486651 | MH508439 | MH486100 | MH508908 | MH485614 |
| *A. muscaria* | MB-001171 (duplicate HKAS84851) | Germnay | MH486652 | MH508442 | MH486101 | MH508909 | MH485617 |
| *A. neoovoidea* | HKAS100506 | Fujan, China | MH486654 | MH508444 | MH486104 | MH508911 | MH485619 |
| *A. neoovoidea* | HKAS89025 | Xishuangbanna, Yunnan, China | MH486656 | MH508445 | MH486106 | MH508913 | MH485621 |
| *A. ocreata* | HKAS79686 | CA, USA | MH486688 | KJ466381 | KJ466607 | KJ481947 | KJ466518 |
| *A. pallidorosea* | HKAS61937 | Meixian, Shaanxi, China | KJ466443 | KJ466382 | KJ466609 | KJ481949 | KJ466520 |
| *A. pallidorosea* | HKAS75786 | Tianshui, Gansu, China | JX998054 | JX998037 | KJ466627 | JX998011 | KJ466539 |
| *A. pallidorosea* | HKAS77329 | Suiyang, Guizhou, China | KJ466447 | KJ466387 | KJ466610 | KJ481950 | KJ466521 |
| *A. pantherina* | HKAS56702 | Czech Republic | KR824782 | MH508487 | KR824789 | KR824825 | MH485670 |
| *A. parvipantherina* | HKAS54723 | Puer, Yunnan, China | KR824780 | MH508495 | KR824802 | KR824807 | MH485676 |
| *A. parvipantherina* | HKAS67907 | Baoshan, Yunnan, China | KR824781 | MH508498 | KR824803 | KR824808 | MH485679 |
| *A. pseudosychnopyramis* | HKAS87999 | Lijiang, Yunnan, China | KR824778 | MH508530 | KR824790 | KR824824 | MH485713 |
| *A. rimosa* | HKAS75777 | Baisha, Hainan, China | JX998044 | JX998018 | KJ466615 | JX998005 | KJ466526 |
| *A. rimosa* | HKAS75779 | Shixing, Guangdong, China | JX998046 | JX998020 | KJ466617 | JX998004 | KJ466528 |
| *A. rimosa* | HKAS77105 | Fuzhou, Jiangxi, China | KJ466452 | KJ466391 | KJ466618 | KJ481954 | KJ466529 |
| *A. spissa* | HKAS92051 | Huanren, Liaoning, China | MH486892 | MH508611 | MH486295 | MH509114 | MH485795 |
| *A. spissa* | HKAS92089 | Changbai mountain, Jilin, China | MH486893 | MH508612 | MH486296 | MH509115 | MH485796 |
| *A. spissacea* | HKAS56832 | Baoshan, Yunnan, China | KJ466479 | KJ466372 | KJ466644 | KJ481979 | KJ466558 |
| *A. spissacea* | HKAS57649 | Dali, Yunnan, China | KJ466480 | KJ466373 | KJ466645 | KJ481980 | KJ466559 |
| *A. spissacea* | HKAS71041 | Tomakomai, Hokkaido, Japan | MH486888 | MH508610 | MH486292 | MH509110 | MH485792 |
| *A. squarrosipes* | HKAS76359 | Muli, Sichuan, China | MH486894 | MH508613 | MH486297 | MH509116 | MH485797 |
| *A. strobiliformis* | MB-001177  (duplicate HKAS84872) | Germnay | MH486895 | MH508614 | MH486298 | MH509117 | MH485798 |
| *A. suballiacea* | RET 478-6 | PA, USA | KJ466484 | KJ466419 | KJ466600 | KJ481940 | KJ466512 |
| *A. suballiacea* | RET 490-1 | CT, USA | KJ466485 | KJ466420 | KJ466601 | KJ481941 | KJ466513 |
| *A. suballiacea* | RET 491-7 | MI, USA | KJ466486 | KJ466421 | KJ466602 | KJ481942 | KJ466514 |
| *A. subfrostiana* | HKAS57042 | Nanhua, Yunnan, China | JN941162 | JN943173 | JQ031118 | KJ482003 | KJ466565 |
| *A. subfrostiana* | HKAS58847 | Jianchuan, Yunnan, China | JN941161 | JN943172 | JQ031119 | KR824806 | MH485800 |
| *A. subfuliginea* | HKAS77326 | Lechang, Guangdong, China | KJ466467 | KJ466404 | KJ466636 | KJ481971 | KJ466550 |
| *A. subfuliginea* | HKAS77347 | Mangshan, Hunan, China | KJ466468 | KJ466405 | KJ466637 | KJ481972 | KJ466551 |
| *A. subglobosa* | HKAS54787 | Ninger, Yunnan, China | MH486900 | MH508618 | MH486301 | MH509121 | MH485801 |
| *A. subglobosa* | HKAS56893 | Baoshan, Yunnan, China | JN941157 | JN943176 | JQ031120 | KR824826 | MH485802 |
| *A. subglobosa* | HKAS75017 | Lanping, Yunnan, China | MH486904 | MH508620 | MH486305 | MH509125 | MH485806 |
| *A. subjunquillea* | HKAS100581 | Jinzhai, Anhui, China | MH486908 | MH508622 | MH486309 | MH509128 | MH485808 |
| *A. subjunquillea* | HKAS63418 | Antu, Jilin, China | KJ466488 | KJ466423 | KJ466651 | KJ481986 | KJ466569 |
| *A. subjunquillea* | HKAS74993 | Lanping, Yunnan, China | KJ466489 | KJ466424 | KJ466652 | KJ481987 | KJ466570 |
| *A. submembranacea* | HKAS96167 | Austria | MH486915 | MH508625 | MH486315 | MH509134 | MH485815 |
| *A. subpallidorosea* | LHJ140923-41 | Guizhou, China | KP691692 | KP691683 | KP691701 | KP691670 | KP691711 |
| *A. subpallidorosea* | HKAS77350 | Taichung, Taiwan, China | KJ466462 | KJ466400 | KJ466631 | KJ481966 | KJ466545 |
| *A. subparvipantherina* | HKAS56817 | Baoshan, Yunnan, China | JN941160 | JN943171 | JQ031114 | KR824815 | MH485818 |
| *A. subparvipantherina* | HKAS58891 | Yulong, Yunnan, China | MH486918 | MH508628 | MH486316 | MH509136 | MH485819 |
| *A. subparvipantherina* | HKAS67853 | Lushui, Yunnan, China | KR824773 | MH508629 | KR824797 | KR824817 | MH485820 |
| *A. sychnopyramis* | HKAS101437 | Mount Tianmu, Zhejiang, China | MH486923 | MH508632 | MH486319 | MH509140 | MH485825 |
| *A. timida* | HKAS83228 | Heishiding, Guangdong, China | MH486930 | MH508636 | MH486323 | MH509147 | MH485830 |
| *A. umbrinolutea* | HKAS89201 | Luhuo, Sichuan, China | MH486933 | MH508637 | MH486326 | MH509150 | MH485832 |
| *A. umbrinolutea* | HKAS89637 | Batang, Sichuan, China | MH486934 | MH508638 | MH486327 | MH509151 | MH485833 |
| *A. umbrinolutea* | MB-000658 (duplicate HKAS84965) | Germnay | MH486937 | MH508641 | MH486330 | MH509154 | MH485836 |
| *A. vestita* | HKAS100517 | Zhangping, Fujian, China | MH486940 | MH508644 | MH486334 | MH509159 | MH485841 |
| *A. vestita* | HKAS79687 | Baisha, Hainan, China | KJ466494 | MH508647 | KJ466662 | KJ481995 | KJ466581 |
| *A. virgineoides* | HKAS100518 | Neixiang, Henan, China | MH486944 | MH508648 | MH486339 | MH509165 | MH485845 |
| *A. virosa* | HKAS56694 | Juva, Filand | JX998058 | JX998030 | KJ466664 | JX998007 | KJ466583 |
| *A. virosa* | HKAS90176 | Changbai mountain,Jilin, China | MH486948 | MH508650 | MH486341 | MH509167 | MH485847 |
| *A. virosa* | HMJAU23303 | Fusong, Jilin, China | KJ466497 | KJ466430 | KJ466667 | KJ481998 | KJ466586 |
| *A. yenii* | HKAS87047 | Xishuangbanna, Yunnan, China | MH486951 | MH508652 | MH486344 | MH509171 | MH485850 |
| *A. yuaniana* | HKAS58807 | Lijiang, Yunnan, China | MH486954 | MH508653 | MH486347 | MH509174 | MH485852 |
| *A. yuaniana* | HKAS68662 | Lijiang, Yunnan, China | MH486957 | MH508654 | MH486350 | MH509177 | MH485854 |
| *A. zangii* | HKAS99663 | Limushan, Hainan, China | MH486958 | MH508655 | MH486351 | MH509178 | MH485855 |
| *A. zangii* | HKAS77331 | Limushan, Hainan, China | KJ466500 | KJ466433 | KJ466669 | KJ482001 | KJ466589 |
| *A. zonata* | HKAS97244 | Lancang, Yunnan, China | MH486960 | MH508656 | MH486353 | MH509180 | MH485856 |
| **Outgroups:** |  |  |  |  |  |  |  |
| *Pluteus hongoi* | ZRL20151600 | China | KY418878 | LT716062 | KY419023 | KY419074 | — |
| *Pluteus romellii* | AFTOL-ID 625 | / | AY634279 | — | AY786063 | AY883433 | — |
| *Melanoleuca communis* | ZRL20151882-1 | China | KY418885 | — | KY419030 | KY419080 | — |
| *Melanoleuca verrucipes* | AFTOL-ID 818 | / | DQ457687 | — | DQ474119 | GU187726 | — |

“*A*.” is abbreviation of the generic name “*Amanita*”, “*C*.” is abbreviation of the generic name “*Catatrama*”, “*L.*” is abbreviation of the generic name “*Limacella*”, “*Lim*.” is abbreviation of the generic name “*Limacellopsis*” and “*M*.” is abbreviation of the generic name “*Myxoderma”*.

－ represents missing corresponding sequences.

Table S2 Accession numbers and voucher information of species used for the phylogeny of Agaricales in Dataset I.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Taxon | Herbarium ID | GenBank accession numbers | | |
| nrLSU | *rpb1* | *rpb2* |
| *Agaricus bisporus* | AFTOL ID 448 | AY635775 | — | AF107785 |
| *Agrocybe pediades* | AFTOL-ID 1493 | DQ110872 | — | — |
| *Agrocybe praecox* | AFTOL ID 728 | AY646101 | DQ516069 | DQ385876 |
| *Alnicola escharoides* | WTU PBM 1719 | AY380405 | AY351840 | AY337411 |
| *Amanita brunnescens* | AFTOL-ID 673 | AY631902 | AY788847 | AY780936 |
| *Amanita phalloides* | Ben Woo Oct 1986  (WTU) | AY380359 | AY485639 | AY485609 |
| *Ampulloclitocybe clavipes* | AFTOL ID 542 | AY639881 | AY788848 | AY780937 |
| *Anamika angustilamellata* | AFTOL ID 543 | AY575919 | — | — |
| *Anthracophyllum archeri* | AFTOL ID 973 | AY745709 | DQ435799 | DQ385877 |
| *Antrodia* sp. | AFTOL-ID 1504 | DQ457649 | — | — |
| *Armillaria mellea* | AFTOL ID 449 | AY700194 | AY788849 | AY780938 |
| *Asterophora lycoperdoides* | CBS170-86 | AF223190 | DQ367424 | DQ367431 |
| *Athelia bombacina* | ATCC 20629 | AF279377 | — | AY641027 |
| *Baeospora myosura* | AFTOL-ID 1799 | DQ457648 | DQ435801 | DQ470827 |
| *Bolbitius vitellinus* | AFTOL-ID 730 | AY691807 | DQ435802 | DQ385878 |
| *Boletopsis leucomelaena* | AFTOL-ID 1527 | DQ154112 | — | — |
| *Bondarzewia montana* | AFTOL-ID 452 | DQ234539 | — | — |
| *Calathella mangrovei* | 1-30-01Jones | AF426954 | — | — |
| *Callistosporium* sp. | AFTOL ID 978 | AY745702 | DQ825413 | DQ825406 |
| *Calocybe carnea* | CBS 552.50 | AF223178 | DQ825423 | DQ367432 |
| *Camarophyllopsis hymenocephala* | AFTOL-ID 1892 | DQ457679 | DQ516070 | DQ472726 |
| *Camarophyllus basidiosus* | AFTOL-ID 1759 | DQ457651 | DQ435805 | DQ470828 |
| *Catathelasma ventricosum* | AFTOL-ID 1488 | DQ089012 | — | DQ470830 |
| *Chaetocalathus liliputianus* | MCA485 | AY916680 | AY916683 | — |
| *Chamaeota sinica* | AFTOL-ID 1382 | DQ457653 | — | — |
| *Cheimonophyllum candidissimum* | AFTOL-ID 1765 | DQ457654 | DQ447888 | DQ470831 |
| *Cheimonophyllum candidissimum* | AFTOL-ID 1765 | DQ457654 | DQ447888 | DQ470831 |
| *Chlorophyllum agaricoides* | AFTOL ID 440 | AY700187 | DQ447889 | — |
| *Chondrostereum purpureum* | HHB-13334-sp. | AF518607 | — | AY218477 |
| *Chromosera cyanophylla* | AFTOL-ID 1684 | DQ457655 | — | — |
| *Chrysomphalina chrysophylla* | AFTOL ID 1523 | DQ457656 | DQ516071 | — |
| *Chrysomphalina grossula* | Gulden 417/75, O | U66444 | DQ516072 | DQ470832 |
| *Clavaria zollingeri* | AFTOL-ID 563 | AY639882 | AY857987 | AY780940 |
| *Clavulinopsis laeticolor* | AFTOL-ID 984 | AY745693 | DQ447890 | DQ385880 |
| *Clitocybe dealbata* | HC 95.cp3 | AF223175 | DQ825414 | DQ825407 |
| *Clitopilus* sp. | AFTOL-ID 522 | AY700181 | DQ825416 | DQ825408 |
| *Collybia tuberosa* | AFTOL ID 557 | AY639884 | AY857982 | AY787219 |
| *Coniophora arida* | 373 | AF098375 | — | DQ366282 |
| *Conocybe lactea* | AFTOL-ID 1675 | DQ457660 | DQ447893 | DQ470834 |
| *Coprinellus disseminatus* | — | AF056456 | — | DQ056143 |
| *Coprinus cinereus* | C13 | AF041494 | — | — |
| *Cortinarius iodes* | AFTOL ID 285 | AY702013 | AY857984 | AY536285 |
| *Cotylidia* sp. | AFTOL-ID 700 | AY629317 | — | — |
| *Crepidotus variabilis* | REG JE 5.3 | AY293174 | — | — |
| *Crinipellis zonata* | OKM 25450 | AY916690 | AY916693 | — |
| *Crucibulum laeve* | Crul1 | AF336246 | — | DQ470836 |
| *Cyathus striatus* | Cyst1 | AF336247 | DQ447895 | DQ472711 |
| *Cyphella digitalis* | AFTOL-ID 663 | AY635771 | — | — |
| *Cyphellopsis anomala* | CBS151.79 | AF426955 | — | — |
| *Cyphellostereum laeve* | AFTOL-ID 982 | AY745705 | — | — |
| *Cyptotrama asprata* | RV98/78 | AF261353 | — | — |
| *Cystoderma amianthinum* | AFTOL-ID 1553 | DQ154108 | DQ516073 | — |
| *Dendrocollybia racemosa* | DED5575 | AF042598 | DQ825417 | DQ825409 |
| *Dendrocollybia racemosa* | DED5575 | AF042598 | DQ825417 | DQ825409 |
| *Descolea maculata* | AFTOL-ID 1521 | DQ457664 | DQ447897 | — |
| *Echinodontium tinctorium* | DAOM16666 | AF393056 | — | — |
| *Entoloma prunuloides* | AFTOL-ID 523 | AY700180 | DQ447898 | DQ385883 |
| *Epithele typhae* | AFTOL-ID 1724 | DQ457665 | — | — |
| *Fibulorhizoctonia* sp. | AFTOL-ID 576 | AY635779 | AY857985 | AY885161 |
| *Fistulina antarctica* | CBS 701.85 | AY293181 | DQ447899 | DQ472713 |
| *Flammula alnicola* | AFTOL-ID 1501 | DQ457666 | DQ447900 | DQ472714 |
| *Flammulaster* sp. | PBM 1871 | AY380408 | AY333308 | AY333315 |
| *Flammulina velutipes* | AFTOL-ID 558 | AY639883 | AY858966 | AY786055 |
| *Galerina atkinsoniana* | AFTOL-ID 1760 | DQ457668 | — | — |
| *Galerina semilanceata* | PBM 1398 | AY038309 | AF389531 | AY337357 |
| *Gliophorus laetus* | AFTOL-ID 1555 | DQ154109 | — | — |
| *Gloeophyllum sepiarium* | DAOM137861 | AF393059 | — | — |
| *Gloiocephala aquatica* | AFTOL-ID 517 | DQ097343 | — | DQ472715 |
| *Granulobasidium vellereum* | AFTOL-ID 887 | AY745729 | — | — |
| *Gymnopilus sapineus* | PBM 1541 (WTU) | AY380362 | AY351789 | AY337358 |
| *Gymnopus contrarius* | AFTOL-ID 1758 | DQ457670 | DQ447902 | DQ472716 |
| *Halocyphina villosa* | IFO32086 | AF426957 | — | — |
| *Hebeloma velutipes* | AFTOL-ID 980 | AY745703 | DQ447904 | DQ472718 |
| *Hemimycena gracilis* | AFTOL-ID 1732 | DQ457671 | DQ447905 | DQ472719 |
| *Henningsomyces candidus* | RGThorn156 | AF287864 | AY860521 | AY218513 |
| *Hericium americanum* | AFTOL-ID 469 | DQ411538 | — | — |
| *Heterobasidion annosum* | DAOM73191 | AF287866 | — | — |
| *Hohenbuehelia tristis* | RV95/573 | AF042602 | — | — |
| *Humidicutis marginata* | JM96/33 | AF042580 | — | — |
| *Hydnellum geogenium* | AFTOL-ID 680 | AY631900 | — | — |
| *Hydnochaete duportii* | AFTOL-ID 666 | AY635770 | — | — |
| *Hydropus* cf*. scabripes* | PBM2513 | DQ411536 | DQ447908 | DQ457634 |
| *Hydropus marginellus* | AFTOL-ID 1720 | DQ457674 | — | DQ472722 |
| *Hygrocybe cantharellus* | AFTOL-ID 1714 | DQ457675 | DQ447909 | — |
| *Hygrocybe coccinea* | AFTOL-ID 1715 | DQ457676 | DQ447910 | DQ472723 |
| *Hygrophoropsis aurantiaca* | AFTOL-ID 714 | AY684156 | AY858961 | AY786059 |
| *Hygrophorus auratocephala* | AFTOL-ID 1727 | DQ457672 | DQ447906 | DQ472720 |
| *Hymenagaricus taiwanensis* | AFTOL-ID 1383 | DQ457680 | — | — |
| *Hyphoderma praetermissum* | AFTOL-ID 518 | AY700185 | — | — |
| *Hypholoma fasciculare* | PBM 1844 | AY380409 | AY351829 | AY337413 |
| *Infundibulicybe gibba* | AFTOL-ID 1508 | DQ457682 | DQ447913 | DQ472727 |
| *Inocephalus* sp. | AFTOL-ID 1558 | DQ457683 | — | DQ472728 |
| *Inocybe dulcamara* | AFTOL-ID 482 | AY700196 | DQ447916 | AY803751 |
| *Kuehneromyces rostratus* | AFTOL-ID 1676 | DQ457684 | DQ447918 | DQ472730 |
| *Laccaria ochropurpurea* | AFTOL-ID 477 | AY700200 | — | DQ472731 |
| *Laccaria pumila* | — | AF287869 | — | — |
| *Lachnella villosa* | CBS609.87 | DQ097362 | — | DQ472732 |
| *Lachnocladium* sp. | AFTOL-ID 1556 | DQ154110 | — | — |
| *Lacrymaria velutina* | AFTOL-ID 478 | AY700198 | — | DQ472733 |
| *Lactarius lignyotus* | AFTOL-ID 681 | AY631898 | — | — |
| *Langermannia gigantea* | DSH 96-032 | AF518603 | — | — |
| *Lentinula edodes* | TMI1941 | AF261557 | — | — |
| *Lentinula lateritia* | DSH92-143 | AF287872 | — | AY218492 |
| *Lepista irina* | AFTOL-ID 815 | DQ234538 | DQ447919 | DQ385885 |
| *Leptonia canescens* | TB5657 | AF261307 | — | — |
| *Lichenomphalia umbellifera* | DAOM180811 | AF261445 | — | — |
| *Limnoperdon incarnatum* | IFO30398 | AF426958 | — | — |
| *Lycoperdon pyriforme* | DSH96-054 | AF287873 | AY860523 | AY218495 |
| *Lycoperdon pyriforme* | DSH96-054 | AF287873 | AY860523 | AY218495 |
| *Lyophyllum decastes* | JM 87/16 | AF042583 | DQ825418 | DQ367433 |
| *Macrocystidia cucumis* | AFTOL-ID 1343 | DQ094787 | — | — |
| *Macrolepiota dolichaula* | AFTOL-ID 529 | DQ411537 | DQ447920 | DQ385886 |
| *Marasmius rotula* | AFTOL-ID 1505 | DQ457686 | DQ447922 | DQ474118 |
| *Megacollybia platyphylla* | AFTOL-ID 560 | AY635778 | DQ447923 | DQ385887 |
| *Melanoleuca verrucipes* | AFTOL-ID 818 | DQ457687 | DQ447924 | DQ474119 |
| *Moniliophthora perniciosa* | DIS71 | AY916738 | AY916740 | — |
| *Mycaureola dilseae* | BM17/85 | DQ097348 | — | — |
| *Mycena amabilissima* | AFTOL-ID 1686 | DQ457691 | DQ447926 | DQ474121 |
| *Mycena amicta* | AFTOL-ID 1908 | DQ457692 | — | — |
| *Mycetinis alliaceus* | AFTOL-ID 556 | AY635776 | AY860525 | AY786060 |
| *Mythicomyces corneipes* | AFTOL-ID 972 | AY745707 | DQ447929 | DQ408110 |
| *Naucoria vinicolor* | AFTOL-ID 499 | DQ536415 | DQ536419 | DQ536418 |
| *Neohygrophorus angelesianus* | AFTOL-ID 1719 | DQ470814 | — | — |
| *Nia vibrissa* | M200 | AF334750 | — | DQ408111 |
| *Nivatogastrium nubigenum* | AFTOL-ID 1500 | DQ470815 | — | — |
| *Nolanea sericea* | VHAs03/02 | DQ367423 | DQ825424 | DQ367435 |
| *Omphalotus olearius* | AFTOL-ID 1718 | DQ470816 | — | — |
| *Ossicaulis lignatilis* | DAOM188196 | AF261396 | DQ825420 | DQ825410 |
| *Oudemansiella radicata* | AFTOL-ID 561 | AY645051 | DQ447946 | AY786067 |
| *Panaeolina foenisecii* | J152 | AF041537 | — | — |
| *Panaeolus sphinctrinus* | AFTOL-ID 1499 | DQ470817 | — | — |
| *Panellus stypticus* | DSH 93-213 | AF518634 | — | — |
| *Peniophora nuda* | FPL4756 | AF287880 | — | — |
| *Phaeocollybia festiva* | PBM 2366 | AY509119 | AY509117 | AY509118 |
| *Phaeomarasmius proximans* | PBM 1936 | AY380410 | AY333307 | AY333314 |
| *Phanerochaete chrysosporium* | FPL5175 | AF287883 | — | — |
| *Phlebia radiata* | FPL6140 | AF287885 | — | — |
| *Pholiota squarrosa* | AFTOL-ID 1627 | DQ470818 | DQ447931 | — |
| *Pholiotina filaris* | AFTOL-ID 1498 | DQ470819 | DQ447932 | — |
| *Phyllotopsis nidulans* | RV96/1 | AF042578 | — | — |
| *Phyllotopsis* sp. | AFTOL-ID 773 | AY684161 | DQ447933 | AY786061 |
| *Physalacria bambusae* | AFTOL-ID 515 | DQ097349 | DQ447934 | DQ474123 |
| *Pleuroflammula flammea* | MCA339 | AF367962 | DQ447935 | DQ474124 |
| *Pleurotopsis longinqua* | RV95/473 | AF042604 | — | — |
| *Pleurotus ostreatus* | AFTOL-ID 564 | AY645052 | AY862186 | AY786062 |
| *Pluteus petasatus* | JB91/21 | AF042611 | — | — |
| *Pluteus romellii* | AFTOL-ID 625 | AY634279 | AY862187 | AY786063 |
| *Podoserpula pusio* | AFTOL-ID 1522 | DQ470821 | — | — |
| *Polyporus squamosus* | AFTOL-ID 704 | AY629320 | — | — |
| *Porodisculus pendulus* | HHB-13576-sp | AY293204 | — | — |
| *Psathyrella rhodospora* | AFTOL-ID 723 | AY645058 | — | — |
| *Pseudoarmillariella ectypoides* | AFTOL-ID 1557 | DQ154111 | DQ516076 | DQ474127 |
| *Psilocybe montana* | AFTOL-ID 820 | DQ470823 | — | — |
| *Pterula echo* | AFTOL-ID 711 | AY629315 | — | — |
| *Punctularia strigosozonata* | HHB-11897-sp. | AF518642 | — | — |
| *Pycnoporus* sp. | AFTOL-ID 772 | AY684160 | — | — |
| *Resupinatus alboniger* | RV/JMs.n. | AF042600 | — | — |
| *Rhodocollybia maculata* | AFTOL-ID 540 | AY639880 | DQ447936 | AY787220 |
| *Rhodocybe mundula* | AFTOL-ID 521 | AY700182 | DQ447937 | Q474128 |
| *Rickenella fibula* | AFTOL-ID 486 | AY700195 | — | — |
| *Sarcomyxa serotina* | AFTOL-ID 536 | AY691887 | DQ447938 | Q859892 |
| *Schizophyllum commune* | Sco1, REG | AF334751 | — | AY218515 |
| *Schizophyllum radiatum* | AFTOL-ID 516 | AY571023 | DQ447939 | Q484052 |
| *Serpula himantioides* | HB-17587-sp. | AF518648 | — | Q366283 |
| *Simocybe serrulata* | AFTOL-ID 970 | AY745706 | DQ447940 | Q484053 |
| *Stereum hirsutum* | FPL8805 | AF393078 | AY864885 | AY218520 |
| *Stropharia ambigua* | AFTOL-ID 726 | AY646102 | DQ447941 | Q484054 |
| *Tephrocybe boudieri* | BSI96/84 | DQ825430 | DQ825421 | DQ825411 |
| *Termitomyces* sp. | AFTOL-ID 1384 | DQ110875 | DQ447942 | — |
| *Tetrapyrgos subdendrophora* | ATCC 42449 | AY445115 | — | — |
| *Thelephora* sp. | DSH 96-010 | AF287890 | — | — |
| *Trametes versicolor* | AFTOL-ID 768 | AY684159 | — | — |
| *Tricholoma aestuans* | AFTOL-ID 497 | AY700197 | — | DQ484055 |
| *Tricholoma myomyces* | KMS 589 | U76459 | DQ842013 | DQ367436 |
| *Tricholomella constricta* | HC 84.75 | AF223188 | DQ825422 | DQ825412 |
| *Tricholomopsis decora* | AFTOL-ID 537 | AY691888 | DQ447943 | DQ408112 |
| *Tubaria confragosa* | AFTOL-ID 498 | AY700190 | DQ447944 | DQ408113 |
| *Tulostoma macrocephala* | Long 10111 FH | AF518663 | — | — |
| *Typhula phacorrhiza* | DSH96-059 | AF393079 | — | AY218525 |
| *Vararia* sp. | AFTOL-ID 662 | DQ470824 | — | — |
| *Verrucospora flavofusca* | AFTOL-ID 655 | DQ470825 | — | — |
| *Volvariella gloiocephala* | AFTOL-ID 890 | AY745710 | DQ447945 | — |
| *Vuilleminia comedens* | T-583 | AF518666 | — | — |
| *Waitea circinata* | AFTOL-ID 1129 | AY885164 | — | — |
| *Xeromphalina campanella* | AFTOL-ID 1524 | DQ470826 | DQ516077 | — |
| *Xerula furfuracea* | AFTOL-ID 538 | AY691890 | — | — |

－ represents missing corresponding sequences.

Table S3 Accession numbers and voucher information of species used for the phylogeny of Amanitaceae in Dataset III.

|  |  |  |  |
| --- | --- | --- | --- |
| Taxon | Herbarium ID | Locality | Accession number |
| *A. abrupta* | ASIS23702 | South Korea | KT894839 |
| *A. abrupta* | LEM960299a | Japan | AB015685 |
| *A.* aff. *caesaroides* | RET-356-10 | Yunnan, China | JX844688 |
| *A.* aff. *citrina* | HKAS 34170 | Sichuan, China | AY436449 |
| *‘A.* aff. *esculenta’* | TRTC-150406 | Thailand | JX844708 |
| *‘A.* aff. *esculenta’* | TRTC-150410 | Thailand | JX844709 |
| *‘A.* aff. *excelsa’* | HKAS 32451 | Sichuan, China | AY436452 |
| *‘A.* aff. *fulva’* | TENN60329 | USA | FJ596776 |
| *A.* aff. *hemibapha* | GMB-2014 | Australia | KP012791 |
| *‘A.* aff. *hemibapha’* | MEL2382921 | Australia | KP012790 |
| *‘A.* aff. *javanica’* | HKAS53281 | China | JX998041 |
| *‘A.* aff. *javanica’* | HKAS56863 | Yunnan, China | JX998040 |
| *‘A.* aff. *javanica’* | HKAS56957 | Yunnan, China | JX998039 |
| *A*. aff. *muscaria* | FB-30986 | Japan | AB096051 |
| *A.* aff. *princeps* | RET-357-5 | Yunan, China | JX844735 |
| *A.* aff. *princeps* | TRTC-150309 | Thailand | JX844734 |
| *‘A.* aff. *princeps’* | DMSC10883 | Thailand | KT213710 |
| *‘A.* aff. *princeps’* | DMSC10886 | Thailand | KT213715 |
| *A.* aff. *tanzanica* | RET-346-7 | Zambia | JX844743 |
| *A.* aff. *virginioides* | 1D5 | Japan | AB973731 |
| *A.* aff. *volvata* | TENN61187 | Tennessee, USA | FJ596795 |
| *A.* aff. *volvata* | TENN61188 | Tennessee, USA | FJ596796 |
| *A. alboverrucosa* | — | Australia | AY194973 |
| *A. alliodora* | DSN062 | Madagascar | KX185611 |
| *A. altipes* | HKAS36609 | Yunnan, China | AY436445 |
| *A. amerivirosa nom. prov.* | RET327-10 | Canada | KJ466396 |
| *A. amerivirosa nom. prov.* | RET368-8 | USA | KJ466397 |
| *A. amerivirosa nom. prov.* | RET397-8 | USA | KJ466398 |
| *A. amerivirosa nom. prov.* | RET480-1 | Canada | KJ466399 |
| *A. aporema* | FRIM 62674 | Malaysia | KU714575 |
| *A. arenaria* | VPI 364 | Australia | GQ925388 |
| *A. arenaria* | VPI 412 | Australia | GQ925393 |
| *A. arenicola* | BA 03.12.26 | Guadeloupe | FR682088 |
| *A. arkansana* | RET-139-10 | USA | JX844675 |
| *A. arkansana* | RET-354-9 | USA | JX844674 |
| *A. atrobrunnea* | BZ\_N09 | Thailand | KY747455 |
| *‘A. atrofusca’* | HKAS36610 | Yunnan, China | AY436446 |
| *A. augusta* | DBB49390 | California, USA | JQ937287 |
| *A. australis* | PDD 89861 | New Zealand | GU222314 |
| *A. austroviridis* | KS 899 / 96 | Australia | JX398324 |
| *A. avellaneosquamosa* | HKAS 38300 | Yunnan, China | AY436447 |
| *A. ballerina* | OR1014 | Thailand | KY747466 |
| *A. ballerina* | OR1026 | Thianland | KY747467 |
| *A. banningiana nom. prov.* | RET 063-2 | USA | KP258985 |
| *A. banningiana nom. prov.* | RET 236-8 | USA | KX348046 |
| *A. basiana* | RET 308-4 | Italy | KP258986 |
| *A. basii* | FCME-Sanchez-S-44 | Mexico | JX844680 |
| *A. basii* | RET-260-6 | Mexico | JX844682 |
| *A. basiorubra* | EMD 16-2011 | Australia | KF815731 |
| *A. basiorubra* | KS1878\_clone\_6.30 | Australia | KF803244 |
| *‘A. battarrae’* | LE<RUS>:296458 | Russia | KM658290 |
| *A. beckeri* | 7826 | Italy | JF907758 |
| *A. bisporigera* | RET 505-7 | USA | KP224347 |
| *A. bisporigera* | RET377-9 | USA | KJ466374 |
| *A. breckonii* | NY 00066695 | California, USA | KJ535439 |
| *A. brunneitoxicaria* | BZ2015\_02 | Thailand | KY747463 |
| *A. brunneolocularis* | ANDES\_F313 NVE57 | Colombia | FJ890033 |
| *A. brunneoprocera* | BZ2015-24 | Thailand | MF461573 |
| *A. brunneosquamata* | BZ2015-73 | Thailand | MF461581 |
| *A. brunneoumbonata* | BZ2015-67 | Thailand | MF461579 |
| *A. brunnescens* | RET 488-6 | USA | KC855218 |
| *A. brunnescens* | RET 554-1 | USA | KP284275 |
| *A. caesarea* | 10350 | Italy | JF907759 |
| *A. caesarea* | AH 31721 | Spain | AY486237 |
| *A. caesarea* | BL-1 | Bulgaria | LC056763 |
| *A. caesarea* | RET-036-2 | Italy | JX844687 |
| *A. caesarea* | SP-1 | Spain | LC056762 |
| *A. caesareoides* | Ajav070921 | Japan | LC056752 |
| *A. caesareoides* | ASIS07719 | South Korea | KP004949 |
| *A. caesareoides* | ASIS26932 | South Korea | KU139501 |
| *A. caesareoides* | S-125 | Japan | AB759082 |
| *A. caesareoides* | S-259 | Japan | LC056756 |
| *A. caesareoides* | S-292 | Japan | LC056757 |
| *A. caesareoides* | S-323 | Japan | LC056758 |
| *A. calyptratoides* | RET 614-6 | USA | KP258994 |
| *A. calyptroderma* | CB0847 | Mexico | KT874940 |
| *A. calyptroderma* | CB0874 | Mexico | KT874938 |
| *A. calyptroderma* | RET-092-6 | USA | JX844696 |
| *A. calyptroderma* | RET-385-3 | USA | JX844692 |
| *A. calyptroderma* | RET-385-4 | USA | JX844698 |
| *A. campinaranae* | TH8453 | Guayana | KC155383 |
| *A. carneiphylla* | LEM11-2005 | Australia | JX398325 |
| *A. castanea* | MFLU:15-01424 | Thailand | KU904823 |
| *A. ceciliae* | KA12-0758 | South Korea | KF017929 |
| *A. ceciliae* | KA12-0916 | South Korea | KF017930 |
| *A. ceciliae* | LEM950069 | Japan | AB015694 |
| *‘A. calyptroderma’* | DAK-M-08 | India | KC797155 |
| *A.* cf. *caesarea* | LM-UNAH 0056 | Honduras | HM639264 |
| *A.* cf. *flavorubescens* | JMP0098 | Western Wisconsin, USA | EU819454 |
| *‘A.* cf. *hemibapha’* | TRTC-150286 | Thailand | JX844714 |
| *‘A.* cf. *hemibapha’* | TRTC-150314 | Thailand | JX844717 |
| *A.* cf. *longistriata* | 92 | Sichuan, China | JN182879 |
| *‘A.* cf. *manginiana’* | BZ\_N11 | Thailand | KY747457 |
| *A.* cf. *sinicoflava* | NAMA235 | Western Wisconsin, USA | EU819496 |
| *A. chatamagotake* | Asim090716 | Jpan | AB750727 |
| *‘A. chepangiana’* | HKAS34218 | Sichuan, China | AY436450 |
| *A. chepangiana* | HKAS56718 | Yunnan, China | KU714569 |
| *A. cinnamomea* | BZ2015-48 | Thailand | MF461576 |
| *‘A. cinnamomescens’ nom. prov.* | RET 718-7 | India | KX810029 |
| *‘A. cinnamomescens’ nom. prov.* | RET-290-5 | Pakistan | JX844699 |
| *‘A. citrina* f. *lavendula’* | TENN61710 | North Carolina, USA | JF313666 |
| *‘A. citrina’* | TENN61704 | North Carolina, USA | FJ596864 |
| *‘A. citrina’* | TENN61704 | USA | FJ596868 |
| *A. cinereopannosa* | — | North Carolina, USA | FJ596835 |
| *A. cinereopannosa* | TENN61560 | USA | FJ596838 |
| *A. cinereopannosa* | TENN61560 | USA | FJ596837 |
| *A. cingulata* | HKAS100640 | Jiangxi, China | MF952721 |
| *A. cingulata* | HKAS75600 | Hunnan, China | KY949582 |
| *A. citrina* | CBS441.91 | South Korea | AF085489 |
| *A. citrina* | HKAS31449 | Germany | AY436481 |
| *A. citrina* | KF02-04 | Denmark | AJ889919 |
| *A. citrina* | KF02-48 | Denmark | AJ889920 |
| *A. citrina* var. *grisea* | LEM970501 | Japan | AB015680 |
| *‘A. clarisquamosa’* | — | Yunnan, China | FJ375331 |
| *A. concentrica* | CBM:FB-24901 | Japan | NR\_119387 |
| *A. conicobulbosa* | LEM25-2005 | Australia | JX398327 |
| *A. conicoverrucosa* | — | Australia | AY194972 |
| *A. constricta* | SMI197 | British Columbia, Canada | HQ650724 |
| *A. constricta* | F1430 | Canada | AY228351 |
| *A. constricta* | F15191 | Canada | DQ384583 |
| *A. constricta* | UBCOGTR0411s | Canada | EU597073 |
| *A. craseoderma* | TH 8907 | Guyana | KC155382 |
| *A. crocea* | HKAS 31489 | Germany | AY436484 |
| *‘A. crocea’* | 2192 | Canada | KJ638266 |
| *‘A. crocea’* | A3 | Yunnan, China | FJ441033 |
| *‘A. crocea’* | AT2002097 | Sweden | JQ912665 |
| *A. cruzii* | Baroni8998 | Dominican Republic | KC855223 |
| *A. cruzii* | Baroni9791 | Dominican Republic | KC855222 |
| *A. curtipes* | AH19766 | Spain | AY486235 |
| *A. curtipes* | AH31924 | Spain | EF653963 |
| *A. curtipes* | ASIS24777 | South Korea | KM052544 |
| *A. cylindrispora* | RET 8-11-96-B | USA | AY325839 |
| *A. digitosa* | DMSC20382 | Thailand | KT213722 |
| *A. djarilmari* | PERTH08776075\_1 | Australia | KY977737 |
| *A. djarilmari* | PERTH08776083\_5 | Australia | KY977746 |
| *A. eijii* | A9 | Yunnan, China | FJ441039 |
| *A. eijii* | SFC20140912-04 | South Korea | KT779087 |
| *A. esculenta* | ASIS18388 | South Korea | KP004947 |
| *A. esculenta* | ASIS23297 | South Korea | KM052528 |
| *A. esculenta* | HKAS34169 | Yunnan, China | AY436451 |
| *A. esculenta* | S-331 | Japan | LC056777 |
| *A. eucalypti* | PERTH 8809828 | Australia | KU057396 |
| *A. eucalypti* | PERTH 8809968 | Australia | KU057380 |
| *A. excelsa* | HKAS 31510 | Germany | AY436453 |
| *A. exitialis* | HKAS74673 | Yunnan, China | KJ466375 |
| *A. exitialis* | HKAS75774 | Guangdong, China | JX998027 |
| *A. exitialis* | HKAS75775 | Guangdong, China | JX998026 |
| *A. exitialis* | HKAS75776 | Guangdong, China | JX998025 |
| *A. farinosa* | A6 | Yunan, China | FJ441036 |
| *A. farinosa* | KA12-1009 | South Korea | KF017932 |
| *A. farinosa* | LE 296435 | Russia | KJ739808 |
| *A. fibrillopes* | PERTH 08353158 | Australia | JX398314 |
| *A. flavidocera* | BZ2015-60 | Thailand | MF461578 |
| *A. flavidogrisea* | BZ2015-44 | Thailand | MF461574 |
| *A. flavipes* | HKAS36582 | Yunnan, China | AY436455 |
| *‘A. flavipes’* | LEM960088a | Japan | AB015696 |
| *A. flavipes* | KA12-0685 | South Korea | KF245911 |
| *‘A. flavipes’* | KA12-1517 | South Korea | KF245912 |
| *A. flavoconia* | HKAS 34047 | USA | AY436456 |
| *‘A. flavoconia’* | JMP0097 | USA | EU819463 |
| *A. flavoconia* | LNorvelle2004-07-13-05 | USA | JF313656 |
| *‘A. flavoconia’* | MHM196 | Mexico | EU569281 |
| *‘A. flavoconia’* | MLS029 | USA | GQ452058 |
| *A. flavoconia* | NVE 242 | Colombia | KF937300 |
| *A. flavoconia* | NVE 351 | Colombia | KF937301 |
| *A. flavorubescens* | F:PRL6062 | USA | GQ166902 |
| *A. franchetii* | DBB52095 | Bulgaria | JX515562 |
| *A. franchetii* | DBBJUS01 | Spain | JX515563 |
| *‘A. fritillaria’* | ASIS23437 | South Korea | KM052533 |
| *‘A. fritillaria’* | HKAS38331 | Yunnan, China | AY436457 |
| *‘A. fritillaria’* | KA12-1231 | South Korea | KF245913 |
| *A. frostiana* | 2185 | Canada | KJ638273 |
| *A. fuliginea* | HKAS75782 | Guangdong, China | JX998022 |
| *A. fuliginea* | 87-411 | Japan | AB509747 |
| *A. fuliginea* | ASIS18723 | South Korea | KP004944 |
| *A. fuliginea* | DMSC21015 | Thailand | KT213707 |
| *A. fuliginea* | HKAS74673 | Jiangxi, China | KJ466375 |
| *A. fuliginea* | HKAS75780 | Guangdong, China | JX998023 |
| *A. fuliginea* | HKAS75781 | Guangdong, China | JX998021 |
| *A. fuliginea* | HKAS77132 | Hunan, China | KJ466376 |
| *A. fuliginea* | HKAS77342 | Guangdong, China | KF479045 |
| *A. fuliginea* | HKAS77343 | Guangdong, China | KJ466401 |
| *A. fuliginea* | HKAS77344 | Guangdong, China | KJ466402 |
| *A. fuliginea* | HKAS77351 | Taiwan, China | KJ466403 |
| *A. fuligineodisca* | ANDES\_F404 AFM1812 | Colombia | FJ890027 |
| *A. fuligineoides* | HKAS52316 | Hunan, China | FJ176721 |
| *A. fuligineoides* | HKAS52727 | Hunan, China | JX998024 |
| *A. fulva* | 2741 | Canada | KJ638270 |
| *A. fulva* | 2229 | Canada | KJ638269 |
| *A. fulva* | d14 | Finland | KM517238 |
| *A. fulva* | DG05-04 | United Kingdom | JQ888151 |
| *A. fulva* | KA12-1406 | South Korea | KF017933 |
| *A. fulva* | LE<RUS>:296456 | Russia | KM658291 |
| *A. fulva* | LEM960312b | Japan | AB015692 |
| *A. fulva* | MSC 380554 |  | AY325844 |
| *A. fulva* | TRTC156894 | Canada | JN020968 |
| *A. furfuracea* | HKAS77321 | Yunnan, China | KJ466416 |
| *A. fuscosquamosa* | — | Australia | AY194974 |
| *A. garabitoana* | RET-333-2 | Costa Rica | JX844710 |
| *A. gemmata* | 07045 | California, USA | GQ250399 |
| *‘A. gemmata’* | MHM116 | Mexico | EU569282 |
| *‘A. gemmata’* | UBC F19764 | Canada | HQ604824 |
| *A. gilbertii* | 7813 | Italy | JF907757 |
| *A. gilbertii* | RET 97016 | France | AY325838 |
| *A. glarea* | SUA712(LAH35217) | Pakistan | KY817312 |
| *‘A. gleocystidiosa’* | DMSC09613 | Thailand | KT213717 |
| *‘A. gleocystidiosa’* | DMSC09620 | Thailand | KT213720 |
| *A. griseofolia* | HKAS38159 | Yunnan, China | NR\_119498 |
| *A. griseofolia* | KA12-0818 | South Korea | KF017934 |
| *A. griseofolia* | KA12-0994 | South Korea | KF017935 |
| *A. griseofolia* | KA12-1454 | South Korea | KF017936 |
| *A. griseorosea* | HKAS77332 | Hainan, China | KJ466411 |
| *A. griseorosea* | HKAS77333 | Hainan, China | KJ466412 |
| *A. griseorosea* | HKAS77334 | Hainan, China | KJ466413 |
| *A. griseoturcosa* | FB-30253 | Japan (T) | NR\_119390 |
| *A. griseoverrucosa* | A14 | Yunnan, China | FJ441044 |
| *A. griseoverrucosa* | ASIS22875 | South Korea | KM052536 |
| *A. heishidingensis* | HKAS76122 | Guangdong, China | NR\_151651 |
| *A. heishidingensis* | HKAS81484 | Guandong, China | KJ922999 |
| *‘A. hemibapha’* | A8 | Yunnan, China | FJ441038 |
| *A. hemibapha* | Microbiology M2 | Thailand | AB458888 |
| *‘A. hemibapha’* | GB576 | Australia | KP311468 |
| *‘A. hemibapha’* | GB577 | Australia | KP311467 |
| *‘A. hemibapha’* | HKAS38416 | Yunnan, China | AY436460 |
| *‘A. hemibapha’* | LEM960013 | Japan | AB015697 |
| *‘A. hemibapha’* | MRNo316 | Thailand | LC068790 |
| *A. hemibapha* | MS-1 | Thailand | LC056764 |
| *A. hemibapha* | RET 718-2 | India | KY349225 |
| *A. hemibapha* | RET-342-8 | India | JX844716 |
| *A. hemibapha* | TBGT-Pradeep 5872 | India | KU714567 |
| *‘A. hemibapha’* | — | Yunnan, China | FJ375334 |
| *‘A. hemibapha’* | 84 | Sichua, China | JN182877 |
| *‘A. hemibapha* subsp. *javanica’* | — | Guangdong, China | KC755031 |
| *A. hyperborea* | 15159 | Italy | JF907761 |
| *A. ibotengutake* | LEM970680 | Japan | AB015701 |
| *A. imazekii* | ASIS21934 | South Korea | KM052523 |
| *A. imazekii* | FB-24747 | Japan | AB038765 |
| *A. jacksonii* | 3752 | Canada | KJ638293 |
| *A. jacksonii* | HKAS34041 | USA | AY436461 |
| *A. jacksonii* | RET-393-6 | USA | JX844725 |
| *A. japonica* | LEM960167 | Japan | AB015684 |
| *A. javanica* | DMSC25894 | Thailand | KT213709 |
| *A. javanica* | FRIM 61503 | Malaysia | KU714572 |
| *‘A. javanica’* | MHHNU 30270 | China | KU497535 |
| *A. javanica* | MRNo569 | Thailand | LC068801 |
| *‘A. javanica’* | S-170 | Japan | LC056770 |
| *‘A. javanica’* | S-170 | Japan | LC056768 |
| *‘A. javanica’* | S-170 | Japan | LC056769 |
| *‘A. javanica’* | S-353 | Japan | LC100003 |
| *A. kitamagotake* | Ajav090716 | Japan | AB759083 |
| *A. kitamagotake* | EN-4 | Japan | AB721450 |
| *A. kitamagotake* | S-72 | Japan | AB755778 |
| *A. kotohiraensis* | ASIS25144 | South Korea | KT894850 |
| *A. kotohiraensis* | MHHNU 6998 | Hunan, China | FJ176722 |
| *A. kotohiraensis* | MHHNU 7112 | Guangdong, China | FJ176723 |
| *A. lanei* | src437 | USA | DQ974693 |
| *‘A. lanei’* | src644 | USA | EF559283 |
| *‘A. lavendula’* | FCME Cifuentes 2005-311 | USA | JF313661 |
| *‘A. lavendula’* | FCME Cifuentes 2005-311 | USA | JF313660 |
| *‘A. lignitincta’* | A15 | Yunnan, China | FJ441045 |
| *‘A. longistriata’* | ASIS24976 | South Korea | KM052553 |
| *A. lavendula* | RET 554-8 | USA | KP877552 |
| *A. lesueurii* | PERTH 08351325 | Australia | JX398315 |
| *A. levistriata* | RET 005-2 | USA | KR822251 |
| *A. levistriata* | RET 085-7 | USA | KU248111 |
| *A. lippiae* | RET 418-2 | Brazil | KP258991 |
| *A. liquii* | 0809HT45 | Taiwan, China | GQ466392 |
| *A. liquii* | HKAS36611 | Yunnan, China | AY436462 |
| *A. longipes* | TENN61554 | USA | FJ596830 |
| *A. longipes* | TENN61554 | USA | FJ596834 |
| *A. longistriata* | ASIS22701 | South Korea | KM052525 |
| *A. longistriata* | LE 296420 | Russia | KJ739811 |
| *A. longistriata* | LEM950067 | Japan | AB015678 |
| *A. luteoparva* | BZ2015-46 | Thailand | MF461575 |
| *A. macrocarpa* | 31939I | Guangdong, China | KC408379 |
| *A. macrocarpa* | 32531I | Guangdong, China | KC408380 |
| *A. macrocarpa* | OR1223 | Thailand | KY747471 |
| *A. mafingensis* | H 7002971 | Tanzania | JF710834 |
| *A. mafingensis* | H 7002973 | Tanzania | JF710835 |
| *A. mafingensis* | PC 0084424 | Zambia | JQ512089 |
| *‘A. manginiana’* | HKAS 38460 | Yunnan, China | AY436463 |
| *‘A. manginiana’* | SFC20140823-10 | South Korea | KT779083 |
| *A. magniverrucata* | RET 594-5 | USA | KR919765 |
| *A. magniverrucata* | RET 686-5 | USA | KY296457 |
| *A. marmorata* | PERTH 08690596 | Australia | KU057406 |
| *A. marmorata* | RET 623-7 | Australia | KP757875 |
| *A. masasiensis* | H 7002977 | Tanzania | JF710837 |
| *A. masasiensis* | H 7002979 | Tanzania | JF710836 |
| *A. masasiensis* | PC 0084425 | Zambia | JQ512090 |
| *A. masasiensis* | RET-344-5 | Zambia | JX844730 |
| *A. melleiceps* | FB-30953 | Japan | AB015688 |
| *A. millsii* | HKAS77322 | Australia | KJ466395 |
| *A. millsii* | HO581533\_3 | Australia (T) | KY977716 |
| *A. modesta* | ASIS25166 | South Korea | KT894851 |
| *A. molliuscula* | HKAS75555 | Hubei, China | KJ466408 |
| *A. molliuscula* | HKAS77324 | Shaanxi, China | KJ466409 |
| *A. molliuscula* | HMJAU20469 | Jilin, China | KJ466410 |
| *A. morrisii* | RET 271-7 | USA | KT213441 |
| *A. morrisii* | RET 448-5 | USA | KP284300 |
| *‘A. multisquamosa’* | 15239 (NY) | USA | AB080786 |
| *A. multisquamosa* | 36442(NY) | USA | AB103329 |
| *‘A. muscaria’* | GAL15335 | Alaska, USA | EU071945 |
| *‘A. muscaria’* | GAL2810 | Alaska, USA | DQ060904 |
| *‘A. muscaria’* | GAL3169 | Alaska, USA | DQ060905 |
| *‘A. muscaria’* | NY45883 | Massachusetts, USA | AB080792 |
| *‘A. muscaria’* | RET 124-2 | Massachusetts, USA | EU071896 |
| *‘A. muscaria’* | RET 271-2 | New Jersey, USA | EU071899 |
| *‘A. muscaria’* | RET 271-3 | New Jersey, USA | EU071919 |
| *‘A. muscaria’* | RET 303-4 | New Jersey, USA | EU071917 |
| *‘A. muscaria* var. *regalis’* | 4220 (O) | Norway | AB080782 |
| *‘A. muscaria* var. *regalis’* | 506 | Norway | AB080780 |
| *A. murrilliana* | RET 076-3 | USA | KX219633 |
| *A. murrilliana* | RET 715-10 | USA | KY655758 |
| *A. muscaria* | GAL 18810-2 | Alaska, USA | EU071954 |
| *A. muscaria* | GAL 8950 | Alaska, USA | DQ060901 |
| *A. muscaria* | GAL3643 | Alaska, USA | EU071948 |
| *A. muscaria* | RET 136-2 | Washington, USA | EU071936 |
| *A. muscaria* | RET 152-6 | Germany | EU071897 |
| *A. muscaria* | RET 264-7 | Washington, USA | EU071898 |
| *A. neoovoidea* | A10 | Yunnan, China | FJ441040 |
| *A. neoovoidea* | RET 359-1 | Yunnna, China | KX270315 |
| *‘A. novinupta’* | HC-PNNT-114 | Mexico | KT874947 |
| *A. novinupta* | NY 00066710 | USA | KJ535437 |
| *‘A. novinupta’* | — | USA | GQ250403 |
| *‘A. novinupta’* | GO-2009-234 | Mexico | KC152066 |
| *‘A. novinupta’* | src669 | Mexico | KT874948 |
| *A. oberwinklerana* | MHHNU 6826 | Hunan, China | FJ176727 |
| *A. oberwinklerana* | MHHNU 7114 | Guangdong, China | FJ176726 |
| *A. oblongispora* | 15831 | USA | JF907762 |
| *A. ochrophylla* | — | Australia | AY194977 |
| *A. ochroterrea* | PERTH:08334897 | Australia | KF815732 |
| *A. ochroterrea* | PERTH:08334897 | Australia | KF815735 |
| *A. ocreata* | HKAS79686 | USA | KJ466381 |
| *A. orientifulva* | ASIS15547 | South Korea | KP004956 |
| *A. orientifulva* | HKAS 32522 | Yunnan, China | AY436464 |
| *A. orientifulva* | KA12-0642 | South Korea | KF017940 |
| *A. orientigemmata* | HKAS 38345 | Yunan, China | AY436465 |
| *‘A. orsonii’* | RET 140-6 | Pakistan | KU248133 |
| *‘A. orsonii’* | RET 390-4 | Pakistan | KU248132 |
| *‘A. orsonii’* | RET 717-8 | India | KX270327 |
| *A. ovalispora* | A11 | Yunnan, China | FJ441041 |
| *A. pachycolea* | SMI351 | Canada | HQ650725 |
| *A. pakistanica* | NY 00632703 | Pakistan | KX061524 |
| *A. pallidorosea* | HKAS 54164 | Chongqing, China | FJ176736 |
| *A. pallidorosea* | HKAS61937 | Shaanxi, China | KJ466382 |
| *A. pallidorosea* | HKAS71023 | Hokkaido, Japan | KJ466383 |
| *A. pallidorosea* | HKAS75483 | Hubei, China | KJ466384 |
| *A. pallidorosea* | HKAS75783 | Yunnan, China | JX998035 |
| *A. pallidorosea* | HKAS77328 | Henan, China | JX998036 |
| *A. pallidorosea* | HKAS75786 | Gansu, China | JX998037 |
| *A. pallidorosea* | HKAS77327 | Guizhou, China | KJ466386 |
| *A. pallidorosea* | HKAS77329 | Hunan, China | KJ466387 |
| *A. pallidorosea* | HKAS77329 | Guizhou, China | KJ466387 |
| *A. pallidorosea* | HKAS77349 | Shandong, China | KJ466389 |
| *‘A. pantherina’* | FB-30956 | Japan | AB080973 |
| *‘A. pantherina’* | LEM960235 | Japa | AB080976 |
| *A. pantherina* | M-31408 (K) | United Kingdom | AB080774 |
| *A. pantherina* | M-61495 (K) | United Kingdom | AB096046 |
| *A. pantherina* | M-66889 (K) | United Kingdom | AB080776 |
| *‘A. pantherina’* | 9013 | USA | GQ401354 |
| *‘A. pantherina’* | 45927 (NY) | USA | AB080785 |
| *‘A. pantherina’* | 45927 (NY) | USA | AB080784 |
| *A. perpasta* | — | Australia | AB509926 |
| *A. persicina* | RET 112-6 | Mississippi, USA | EU071888 |
| *A. persicina* | RET 151-6 | Alabama, USA | EU071891 |
| *A. persicina* | RET 328-2 | New Jersey, USA | EU071926 |
| *A. phalloides* | HKAS75773 | USA | JX998031 |
| *A. ponderosa* | AH 19699 | Spain | EF653962 |
| *A. ponderosa* | AH 19752 | Spain | AY486234 |
| *A. ponderosa* | AH31718 | Spain | AY486233 |
| *A. populiphila* | RET 103-3 | USA (T) | KP224318 |
| *A. populiphila* | RET 423-2 | USA | KP224322 |
| *A. populiphila* | RET 447-1 | Canada | KP224317 |
| *A. porphyria* | HKAS 31531 | Germany | AY436471 |
| *A. porphyria* | RET 077-1 | USA | KP866179 |
| *A. porphyria* | RET 311-2 | Norway | KP866177 |
| *A. porphyria* | RET 366-3 | USA | KP866180 |
| *A. porphyria* | SMI240 | Canada | HQ650726 |
| *A. porphyria* | TRTC156850 | Canada | JN020970 |
| *A. preissii* | PERTH 8690766\_1 | Australia | KY290657 |
| *A. princeps* | FRIM 62849 | Malaysia | KU714576 |
| *A. protecta* | NY00066692 | USA | KP224324 |
| *A. protecta* | RET 277-5 | USA | KP224326 |
| *A. pseudopantherina* | HKAS26746 | Yunnan, China | AY436466 |
| *‘A. pseudoporphyria’* | A16 | Yunnan, China | FJ441046 |
| *‘A. pseudoporphyria’* | A4 | Yunnan, China | FJ441034 |
| *A. pseudoporphyria* | ASIS26942 | South Korea | KU139526 |
| *‘A. pseudoporphyria’* | FB-30951(CBM) | Japan | AB015702 |
| *‘A. pseudovaginata’* | LE<RUS>:216819 | Russia | KM658285 |
| *A. pseudoporphyria* | MHHNU 30897 | China | KU497541 |
| *A. pseudovaginata* | HKAS 38323 | Yunnan, China | AY436470 |
| *A. punctata* | — | Australia | AY194978 |
| *A. punctata* | LEM960270 | Japan | AB015693 |
| *A. pyramidifera* | — | Australia | AY194979 |
| *‘A. pyriformis’* | DMSC410876 | Thailand | KT213723 |
| *A. quenda* | PERTH:08587116 | Australia | KP137063 |
| *A. rhacopus* | RET 181-8 | USA | KP224332 |
| *A. rhacopus* | RET 313-3 | USA | KP224334 |
| *A. rimosa* | HKAS49675 | Hunan, China | FJ176728 |
| *A. rimosa* | HKAS75777 | Hainan, China | JX998018 |
| *A. rimosa* | HKAS75778 | Hainan, China | JX998019 |
| *A. rimosa* | HKAS75779 | Guangdong, China | JX998020 |
| *A. rimosa* | HKAS77105 | Jiangxi, China | KJ466391 |
| *A. rimosa* | HKAS77120 | Jiangxi, China | KF479044 |
| *A. rimosa* | HKAS77279 | Guangdong, China | KJ466392 |
| *A. rimosa* | HKAS77335 | Hainan, China | KJ466393 |
| *A. rimosa* | HKAS77336 | Hainan, China | KJ466394 |
| *A. rimosa* | MFLU:15-0153 | Tailand | KU904819 |
| *A. roanokensis* | FLAS-F-60017 | USA | KY654730 |
| *A. roseitincta* | RET 032-7 | USA | KC855226 |
| *A. roseitincta* | RET 284-10 | USA | KC855224 |
| *A. roseitincta* | RET 313-5 | USA | KC855225 |
| *A. roseolamellata* | — | Australia | AY194980 |
| *A. roseolamellata* | RET 473-4 | Australia | KP866164 |
| *A. roseolamellata* | RET 497-5 | Australia | KP866166 |
| *A. rubescens* | — | Spain | KY595996 |
| *A. rubescens* | ANDES\_F415 NVE3 | Colombia | FJ890030 |
| *A. rubescens* | ANDES\_F416 NVE160 | Colombia | FJ890031 |
| *A. rubescens* | IFO-8266 | South Korea | AF085484 |
| *‘A. rubescens’* | JMP0003 | USA | EU819464 |
| *A. rubescens* | KA12-1221 | South Korea | KF245919 |
| *‘A. rubescens’* | LEM950063 | Japan | AB015682 |
| *A. rubescens* | RK01-01 | Denmark | AJ889923 |
| *‘A. rubescens’* | SOC1252 | USA | FJ235155 |
| *A. rubromarginata* | MFLU:15-01420 | Thailand | KU904822 |
| *A. rubromarginata* | RET 383-1 | Japan | KP662538 |
| *A. rubrovolvata* | BZ2015\_68 | Tailand | KY747465 |
| *A. silvicola* | 7061 | California, USA | GQ250408 |
| *A. silvicola* | 07061 | USA | GQ250408 |
| *A. silvicola* | MK2 | Canada | KP406556 |
| *A. silvicola* | RET 594-9 | USA | KR919766 |
| *‘A. similis’* | Asim090716-2 | Japan | LC056774 |
| *A. similis* | FRIM 3740 | Malaysia | KU714566 |
| *A. similis* | TFM-M P934 | Indonesia | KU714568 |
| *‘A. similis’* | S-305 | Japan | LC056775 |
| *A. sinensis* | LEM960255 | Japan | AB080979 |
| *A. sinicoflava* | 2589 | Canada | KJ638257 |
| *A. sinicoflava* | 1023 | Canada | KJ638262 |
| *A. sinicoflava* | 2738 | Canada | KJ638258 |
| *A. sinicoflava* | 3580 | Canada | KJ638260 |
| *A. solitaria* | HKAS 31459 | Germany | AY436475 |
| *‘A.* sp. 1*’* | HKAS 38419 | Yunnan, China | AY436474 |
| *A.* sp. | 157\_13 | Yunan, China | FJ378735 |
| *‘A.* sp.*’* | DMSC09996 | Thailand | KT213721 |
| *A.* sp. | EMD 11-200 | Australia | KF859748 |
| *A.* sp. | EMD 11-2002 | Australia | KF859749 |
| *A.* sp. | EMD 11-2002 | Australia | KF859751 |
| *A.* sp. | EMD 11-2002 | Australia | KF859750 |
| *A.* sp. | FCME-Sanchez-S-31 | Mexico | JX844703 |
| *A.* sp. | HKAS75150 | Bangladesh | KJ466414 |
| *A.* sp. | HKAS77323 | Fujian, China | KJ466415 |
| *A.* sp. | JMAW | USA | KF986265 |
| *A.* sp. | K11 | USA | DQ273350 |
| *A.* sp. | LE 296431 | Russia | KM658293 |
| *A.* sp. | LEM13-2005 | Australia | JX398328 |
| *A.* sp. | LEM41-2005 | Australia | JX398329 |
| *A.* sp. | LG1045 | California, USA | EU071961 |
| *A.* sp. | LG1066 | California, USA | EU071962 |
| *A.* sp. | LG862 | Califonia, USA | EU071958 |
| *A.* sp. | LG864 | Califonia, USA | EU071959 |
| *A.* sp. | MEL:2382912 | Australia | KP012781 |
| *A.* sp. | MEL2151456 | Australia | AY194971 |
| *A.* sp. | MEL2151459 | Australia | AY194967 |
| *A.* sp. | MEL2151460 | Australia | AY194968 |
| *A.* sp. | MEL2151465 | Australia | AY194965 |
| *A.* sp. | NC-2-7294/1 | Switzerland | AY456334 |
| *A.* sp. | RET 128-5 | Washington, USA | KF561972 |
| *A.* sp. | RET 390-3 | Pakistan | KX354365 |
| *A.* sp. | RET 391-7 | India | KC855219 |
| *A.* sp. | RET 426-3 | USA | KP866196 |
| *A.* sp. | RET-292-1 | Mexico | JX844689 |
| *A.* sp. | RET-373-9 | USA | JX844754 |
| *A.* sp. | RET422-8 | USA | KJ466406 |
| *A.* sp. | RET493-6 | USA | KJ466407 |
| *A.* sp. | TENN65597 | North Carolina, USA | KC841904 |
| *‘A.* sp-Thai03*’* | CMU-MC06 | Nepal | JX844763 |
| *A. spissa* | KF02-47 | Denmark | AJ889924 |
| *‘A. spissa’* | — | South Korea | AF085486 |
| *‘A. spissacea’* | LEM960187 | Japan | AB015683 |
| *A. spreta* | RET 234-6 | USA | KX365200 |
| *A. spreta* | RET 632-3 | Canada | KU248117 |
| *A. spreta* | RET-296-2 | USA | JX844742 |
| *A. spreta* | RET-315-10 | USA | JX844740 |
| *A. sturgeonii nom. prov.* | RET 725-1B | USA | KX270303 |
| *A. sturgeonii nom. prov.* | RET 725-1D | USA | KX270305 |
| *A. suballiacea* | FLAS-F-60189 | USA | MF074851 |
| *A. suballiacea* | RET478-6 | USA | KJ466419 |
| *A. suballiacea* | RET490-1 | USA | KJ466420 |
| *A. suballiacea* | RET491-7 | USA | KJ466421 |
| *A. subfrostiana* | HKAS34551 | Yunan, China | AY436476 |
| *A. subfuliginea* | HKAS77326 | Guangdong, China | KJ466404 |
| *A. subfuliginea* | HKAS77347 | Hunan, China | KJ466405 |
| *A. subjunquillea* | HKAS54509 | Yunnan, China | KJ466422 |
| *A. subjunquillea* | HKAS63418 | Jilin, China | KJ466423 |
| *A. subjunquillea* | HKAS74993 | Yunnan, China | KJ466424 |
| *A. subjunquillea* | HKAS75770 | Shaanxi, China | JX998034 |
| *A. subjunquillea* | HKAS75771 | Hubei-China | JX998032 |
| *A. subjunquillea* | HKAS75772 | Gansu, China | JX998033 |
| *A. subjunquillea* | HKAS77325 | Henan, China | KJ466425 |
| *A. subjunquillea* | HKAS77345 | Hubei, China | KJ466426 |
| *A. subjunquillea* | HMJAU20412 | Jilin, China | KJ466427 |
| *A. subjunquillea* | HMJAU23276 | Jilin, China | KJ466428 |
| *‘A. subjunquillea* var. *alba’* | YWE2-20040808 | Yunnan, Chin | EF442101 |
| *‘A. subjunquillea* var. *alba’* | YWE3-20050806 | Yunnan, China | EF442102 |
| *A. submembranacea* | A-9 | Czech Republic | FJ705275 |
| *A. submembranacea* | LE<RUS>:296460 | Russia | KM658295 |
| *A. suborientifulva* | OR1276 | Thailand | MF461584 |
| *A. subovalispora* | BZ2015-70 | Thailand | MF461580 |
| *A. subpallidorosea* | HKAS77350 | Taiwan, China | KJ466400 |
| *A. subpallidorosea* | LHJ140923-17 | Guizhou, China | KP691677 |
| *A. subpallidorosea* | LHJ140923-41 | Guizhou, China | KP691683 |
| *A. subpallidorosea* | LHJ140923-55 | Guizhou, China | KP691680 |
| *A. supravolvata* | RET 103-7 | France | KP258995 |
| *A. sychnopyramis*  f. *subannulata* | LEM960112a | Japan | AB015690 |
| *‘A. tanzanica’* | H 7002986 | Tanzania | JF710839 |
| *‘A. tanzanica’* | H 7002992 | Tanzania | JF710838 |
| *A. texasorora* | RET 575-7 | USA | KP662527 |
| *A. torrendii* | LOU-Fungi 17408 | Spain | GQ925386 |
| *A. tuza* | AR09562 | Mexico | KT874955 |
| *A. tuza* | GO-2009-224 | Mexico | KT874956 |
| *A. umbrinolutea* | HKAS 31451 | Germany | AY436478 |
| *‘A. vaginata’* | — | Thailand | AB451971 |
| *‘A. vaginata’* | 2550 | Italy | JF907756 |
| *‘A. vaginata’* | 332 | Russia | KP783429 |
| *‘A. vaginata’* | ASIS15487 | South Korea | KP004955 |
| *‘A. vaginata’* | BHS2009-05 | USA | GU220372 |
| *‘A. vaginata’* | BHS2009-05 | USA | GU220372 |
| *‘A. vaginata’* | ID PAN 628 | Poland | KM085387 |
| *‘A. vaginata’* | JMP0004 | USA | EU819489 |
| *‘A. vaginata’* | KA12-1190 | South Korea | KF017949 |
| *‘A. vaginata’* | KF02-44 | Denmark | AJ889925 |
| *‘A. vaginata’* | KULG-22 | India | KF306094 |
| *‘A. vaginata’* | LE<RUS>:217377 | Russia | KM658299 |
| *‘A. vaginata’* | LEM950304a | Japan | AB015691 |
| *A. velosa* | 07004 | USA | GQ250409 |
| *A. velosa* | APNo.1 | USA | EU909453 |
| *A. velosa* | SOC 669 | USA | AY918961 |
| *A. vernicoccora* | DBB43538 | USA | NR\_119968 |
| *A. vernicoccora* | MICH:232904 | USA | KR338835 |
| *A. vernicoccora* | RET 385-5 | USA | KY655747 |
| *A. virgineoides* | A2 | Yunnan, China | FJ441032 |
| *A. virgineoides* | LEM960205 | Japan | AB015686 |
| *A. virginiana* | RET-361-6 | USA | JX844749 |
| *A. virginiana* | RET-374-8 | USA | JX844750 |
| *A. virosa* | HKAS56694 | Finland | JX998030 |
| *A. virosa* | HKAS71040 | Hokkaido, Japan | KJ466429 |
| *A. virosa* | HMJAU20396 | Jilin, China | JX998029 |
| *A. virosa* | HMJAU23303 | Jilin, China | KJ466430 |
| *‘A. volvata’* | ASIS24970 | South Korea | KM052547 |
| *A. volvata* | LEM960165 | Japan | AB015681 |
| *A. wadjukiorum* | PERTH 08403988 | Australia | KF258721 |
| *A. wadjukiorum* | PERTH:08403988 | Australia | KF258720 |
| *A. wadjukiorum* | PERTH:08403988 | Australia | KF258722 |
| *A. walpolei* | 46-2012 | Australia | KF815739 |
| *A. xerocybe* | TH 8930 | Guyana | KC155384 |
| *A. yuaniana* | HKAS29516 | Yunnan, China | AY436479 |
| *A. yuaniana* | HKAS32491 | Japan | AB039792 |
| *A. zangii* | GDGM29241 | Fujian, China | KJ466432 |
| *A. zangii* | HKAS77331 | Hainan, China | KJ466433 |
| *A. zangii* | MFLU:15-0144 | Thiland | KU904818 |

Table S4 The best partition schemes and nucleotide substitution models selected by PartitionFinder for Dataset I.

|  |  |  |
| --- | --- | --- |
| Dataset | Partition scheme | Model (RAxML) |
| 3-gene | nrLSU | GTR+I+G |
| *rpb*1\_codon1,2; *rpb*2\_codon1,2;  *tef1-α*\_codon1,2 | GTR+I+G |
| *rpb*1\_codon3; *rpb*2\_codon3;  *tef1-α*\_codon3 | GTR+I+G |

Table S5 The best partition schemes and nucleotide substitution models selected by PartitionFinder for both single gene and 4-gene dataset applied in phylogenetic analyses based on Dataset II.

|  |  |  |
| --- | --- | --- |
| Dataset | Partition scheme | Model (RAxML) |
| nrLSU | full | GTR+I+G |
| *rpb*2 | codon1 | GTR+I+G |
| codon2 | GTR+I+G |
| codon3 | GTR+I+G |
| *tef1-α* | codon1 | GTR+I+G |
| codon2 | GTR+I+G |
| codon3 | GTR+I+G |
| *β-tubulin* | codon1, 2 | GTR+I+G |
| codon3 | GTR+I+G |
| 4-gene | nrLSU | GTR+I+G |
| *rpb*2\_codon2; *tef1*-*α*\_codon2; *β*-*tubulin*\_codon1,2 | GTR+I+G |
| *rpb2\_codon3; tef1-α\_codon3; β-tubulin\_codon3* | GTR+I+G |
| *rpb*2\_codon1 | GTR+I+G |
| *tef1*-*α*\_codon1 | GTR+I+G |

Table S6 The best partition schemes and nucleotide substitution models selected by PartitionFinder for III.

|  |  |  |
| --- | --- | --- |
| Dataset | Partition scheme | Model (RAxML) |
| ITS | ITS1; ITS2 | GTR+G |
| 5.8S | GTR+G |

Table S7 The best partition schemes and nucleotide substitution models selected by PartitionFinder for both single gene and 3-gene dataset applied in phylogenetic analyses based on Dataset IV.

|  |  |  |
| --- | --- | --- |
| Dataset | Partition scheme | Model (RAxML) |
| nrLSU | full | GTR+I+G |
| *rpb*2 | codon1 | GTR+I+G |
| codon2 | GTR+I+G |
| codon3 | GTR+I+G |
| *tef1-α* | codon1 | GTR+I+G |
| codon2 | GTR+I+G |
| codon3 | GTR+I+G |
| 3-gene | nrLSU | GTR+I+G |
| *rpb*2\_codon2; *tef1*-*α*\_codon2 | GTR+I+G |
| *rpb*2\_codon3; *tef1*-*α*\_codon3 | GTR+I+G |
| *rpb*2\_codon1 | GTR+I+G |
| *tef1*-*α*\_codon1 | GTR+I+G |