Manuscript title: *Title: Novel Laccaria species from Juglandaceae forest in Panama with notes on their ecology*

Table S1. Specimen data for molecular phylogenetic datasets. Species described as part of this paper are highlighted in a gray background.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SpecimenID** | **Genus Species** | **Location** | **Host** | **ITS** | **28S** | **RPB2** | **ef1a** |
| A0051 | *Laccaria* sp. | Japan, Narusawa | Abies sp., Tsuga diversifolia, Larix leptolepis | KU685613 | - | - | - |
| A0544 | *Laccaria japonica* | Japan, Funyu | - | JN942802 | JN939755 | JN993509 | - |
| A0578 | *Laccaria japonica* | Japan, Tsuchiyu | - | JN942783 | - | - | - |
| A2986 | *Laccaria vinaceoalvanea* | Japan, Fushimi | - | JN942810 | JN939738 | JN993520 | - |
| A2987 | *Laccaria* sp. | Japan, Fushimi | - | JN942786 | JN939739 | JN993521 | - |
| A3344 | *Laccaria amethystina* | China | - | KU685627 | - | - | - |
| ALB183 | *Laccaria amethystina* | China, Tibet  | - | JX504092 | JX504176 | KU686058 | KU686161 |
| AWW251 | *Laccaria* sp. | Malaysia, Pahang Prov., Frazier's Hill | - | JX504093 | JX504177 | - | - |
| AWW438 | *Laccaria alba* | China, Yunan, Shangrila Co. | - | JX504094 | JX504178 | KU685912 | KU686072 |
| AWW446 | *Laccaria montana* | China, Xizang, Bomi Xian | - | JX504097 | JX504181 | KU686054 | KU686157 |
| AWW463 | *Laccaria himalayensis* | China, Tibet, Linzhi Co. | - | JX504098 | JX504182 | KU685913 | - |
| AWW465 | *Laccaria bullipellis* TYPE | China, Tibet, Linzhi Co. | - | JX504100 | JX504184 | KU685914 | -- |
| AWW484 | *Laccaria himalayensis* TYPE | China, Tibet, Linzhi Co. | - | JX504101 | JX504185 | KU685915 |  |
| AWW485 | *Laccaria acanthospora* TYPE | China, Tibet, Linzhi Co. | - | JX504102 | JX504186 | KU685916 | KU686073 |
| AWW544 | *Laccaria* aff. *bicolor* | USA, IL, Johnson Co. | - | KM067820 | - | **MT431173** | - |
| AWW545 | *Laccaria* aff. *ohiensis* | USA, IL, Johnson Co. | - | JX504106 | JX504190 | KU685917 | - |
| AWW557 | *Laccaria* sp. | USA, CA, Nevada Co. | - | **MT279220** | **MT279200** | **MT431174** | **MT436061** |
| AWW567 | *Laccaria bicolor* | USA, MI, Upper Peninsula | - | KM067824 | KU685765 | - | - |
| AWW572 | *Laccaria* sp. | USA, MI, Upper Peninsula | - | KM067827 | KU685767 | KU685921 | - |
| AWW583 | *Laccaria laccata* | USA, OR, Benton Co. | - | KM067828 | KU685768 |  - | - |
| AWW590 | *Laccaria amethysteo-occidentalis* | USA, OR, Benton Co. | - | JX504112 | JX504195 | KU685923 | - |
| AWW591 | *Laccaria* sp. | USA, OR, Benton Co. | - | KM067830 | KU685769 | KU685924 | - |
| AWW595 | *Laccaria* sp. | USA, AK | - | JX504115 | JX504198 | - | - |
| BAP360 | *Laccaria negrimarginata* TYPE | China, Tibet | - | JX504120 | - | - | - |
| Cripps1625 | *Laccaria pseudomontana* TYPE | USA, CO | - | DQ149871 | - | - | - |
| Cripps1771 | *Laccaria pseudomontana* | USA, CO | - | DQ149870 | - | - | - |
| F1061267 | *Hydnangium vinaceoavellanea* | Japan, Tottori | *Castanopsis*  | JX504121 | - | - |  |
| F1098987 | *Laccaria bicolor* | USA, NY | *Pinus* | KM067813 | **MT279201** | **MT431175** | **MT436062** |
| F1121424 | *Laccaria striatula* | China | Pinaceae  | JX504127 | JX504207 | KU686064 | - |
| F1123822 | *Laccaria amethystea* | USA, WI | *Juniperus*  | KU685760 | KU685911 | KU686071 |  - |
| GMM7020 | *Laccaria proxima* | Russia, Caucasus | Fagaceae, Pinaceae | KU685652 | KU685795 | KU685938 | - |
| GMM7167 | *Laccaria amethystina* | - | - | KU685655 | KU685798 | - | KU686083 |
| GMM7584 | *Laccaria proxima* | Komorav Forest, Russia | - | KU685717/KM067833  | KU685858 | KU685999 | KU686120 |
| GMM7586 | *Laccaria striatula* | Komorav Forest, Russia | - | KM067835 | KU685859 | KU686000 | - |
| GMM7596tibet | *Laccaria salmonicola* | China, Tibet |  Picea, Larix  | JX504143 | JX504218 | KU686045 | KU686151 |
| GMM7602Tibet | *Laccaria salmonicola* | China, Tibet | - | JX504145 | JX504220 | - | - |
| PRL7587 | *Laccaria trullisata* | - | - | KM067882 | JX504247 | KU686047 | KU686153 |
| WCG2072 | *Laccaria trullisata* | - | - | KU685749 | - | KU686044 | KU686150 |
| SB2151 | *Laccaria laccata* | Portugal | - | KM067888/JX504173 | JX504250 | **MT431176** | **MT436063** |
| GMM7038 | *Laccaria proxima* | Russia, Caucasus | Fagaceae, Pinaceae | **MT279221** | **MT279202** | **MT431177** | **MT436064** |
| SB2135 | *Laccaria laccata* | Portugal | - | JX504172 | JX504249 | KU686028 | KU686140 |
| SB2238 | *Laccaria bicolor* | Portugal | - | KM067892 | KU685886 | KU686030 | - |
| SB2239 | *Laccaria bicolor* | Portugal | - | KM067893 | KU685887 | KU686031 | - |
| GMM6131 | *Laccaria alba* | China | - | JX504131 | JX504210 | KU685930 | KU686079 |
| F1120750 | *Laccaria alba* | China | Pinaceae, Fagaceae | JX504126 | JX504242 | - | - |
| F1133825 | *Laccaria proxima* | USA, MS | Pinaceae, Fagaceae | KU686064 | KU685786 | KU686065 | - |
| F1068333 | *Laccaria amethysteo-occidentalis* | USA, WI | - | KU685629 | KU685773 | KU686061 | - |
| SB2133 | *Laccaria laccata* | Portugal | - | KM067887 | KU685884 | KU686027 | KU686139 |
| SB2210 | *Laccaria laccata* | Portugal | - | KM067890 | KU685885 | KU686029 | KU686141 |
| F1123584 | *Laccaria ochropurpurea* | USA, IL | Quercus  | **MT279222** | **MT279203** |  - | - |
| F1121451 | *Laccaria laccata* | China | Pinaceae  | JX504128 | JX504208 | - | - |
| AWW585 | *Laccaria bicolor* | USA, OR, Benton Co. | - | JX504111 | JX504194 | - | - |
| GMM7607 | *Laccaria bicolorproxima* | Vallon d. Arcillac, France | - | KM067846 | **MT279204** | **MT431178** | **MT436065** |
| GMM7612 | *Laccaria macrocystidia?* | Vallon d. Arcillac, France | - | KM067847 | KU685861 | KU686002 | KU686122 |
| GMM7620 | *Laccaria* sp. | Forest comaniale de Ste. Croix, France | - | KM067854/ JX504149 | JX504223 | **MT431179** | **MT436066** |
| GMM7621 | *Laccaria amethystina* | Forest comaniale de Ste. Croix, France | - | JX504150 | JX504224 | KU686046 | KU686152 |
| GMM7628 | *Laccaria proxima*? | Forest comaniale de Ste. Croix, France | - | KM067857 | KU685867 | KU686008 | KU686127 |
| GMM7631France | *Laccaria bicolor / proxima* | Forest comaniale de Ste. Croix, France | - | KM067858 | KU685869 | KU686010 | KU686129 |
| GMM7733 | *Laccaria trichodermophora* | USA, TX, Tyler Co. | - | KM067870/JX504157 | JX504230 | KU686013 | - |
| HKAS41483 | *Laccaria angustilamella* TYPE | China, Longling County | *Quercus*, *Lithocarpus* |   | JX504233 |  - | -  |
| HKAS44062 | *Laccaria bicolor* | China, Yunnan | - | JX504159 | JX504235 | KU686068 | - |
| HKAS45998 | *Laccaria acanthospora* | China, Tibet | - | KU685719 | KU685870 | KU686069 | - |
| HKAS57950 | *Laccaria alba* | China, Tibet | - | JX504166 | JX504242 | - | - |
| HMAS\_264310 | *Laccaria yunnanensis* | China, Yunnan | - | KX496978 | - | - | - |
| HMAS\_271732 | *Laccaria aurantia* | China, Yunnan | - | KX496971 | - | - | - |
| KH\_07192006\_1 | *Laccaria* JP1 | USA, IN | *Quercus*  | KU685720 | KU685871 | KU686014 | - |
| KH\_LA06\_002 | *Laccaria amethystina* | USA, LA | *Quercus, Fagus* | KU685759 | KU685910 | KU686059 | KU686162 |
| KU962988 | *Laccaria japonica* TYPE | - | - | KU962988 | - | - | - |
| KU962989 | *Laccaria moshuijun* TYPE |  | - | KU962989 | - | - | - |
| LaAM/08/1 | *Laccaria amethystina* | JGI Genome |  - | JGI | JGI | JGI | JGI |
| MB\_FB\_001101 | *Laccaria fulvogrisea* | China, Yunnan | - | JQ670896 | - | - | - |
| MB\_FB\_001107 | *Laccaria yunnanensis* | China, Yunnan | - | JQ670897 | - | - | - |
| MB\_FB\_001109 | *Laccaria aurantia* | China, Yunnan | - | JQ681209 | - | - | - |
| MB\_FB\_001110 | *Laccaria fulvogrisea* | China, Yunnan | - | JQ681210 | - | - | - |
| PRL3777 | *Laccaria ochropurpurea* | USA, IL  | - | KU685732 | JX504246 | KU686024 | - |
| PRL4777 | *Laccaria ochropurpurea* | USA, IL  | Quercus  | KU685733 | KU685883 | KU686025 | - |
| S238N | *Laccaria bicolor* | JGI Genome | - | DQ179123 | - | JGI | JGI |
| MS\_13 | *Laccaria rubroalba* | China | - | KX449360 | - | - | - |
| MS\_28 | *Laccaria rubroalba* | China | - | KX449359 | - | - | - |
| MS\_15 | *Laccaria rubroalba* | China |  - | KX449358 | -  | - | - |
| MS\_20 | *Laccaria rubroalba* | China | - | KX449357 | - | - | - |
| DED7419 | *Laccaria* sp. | Thailand | Dipterocarpus | KX513839/KX513840 | KU685770 | KU685925 | KU686075 |
| DED7426 | *Laccaria* sp. | Thailand | Pinus, Dipterocarpus | KU685628 | KU685771 | KU685926 | KU686076 |
| DED7435 | *Laccaria* sp. | Thailand | Dipterocarpus | KX513841 | KU685772 | KU686060 | **MT436067** |
| TWO1166 | *Laccaria* sp. | Thailand, ChaingMai | Castanopsis, Dipterocarps | KU685744 | KU685895 | KU686041 | **MT436068** |
| TWO1168 | *Laccaria* sp. | Thailand, ChaingMai | Castanopsis, Dipterocarps | KU685745 | KU685896 | KU686042 | KU686146 |
| TWO1178 | *Laccaria* sp. | Thailand, ChaingMai | Pinus, Dipterocarpus | KU685746 | KU685897 | KU686043 | KU686147 |
| TWO1184 | *Laccaria* sp. | Thailand, ChaingMai | Castanopsis  | KU685747 | KU685898 | - | KU686148 |
| TWO1194 | *Laccaria* sp. | Thailand, Prajenburi | - | KU685748 | KU685899 | - | KU686149 |
| TWO1200 | *Laccaria* sp. | Thailand |  - | KU685743 | KU685894 | KU686040 | **MT436069** |
| TWO319 | *Laccaria montana*  | - | - | DQ149862 | - | - | - |
| TWO591 | *Laccaria montana*  | - | - | DQ149865 | - | - | - |
| DKP303 | *Laccaria violaceotincta* | India TYPE | - | MK141034 | - | - | - |
| ASIS24249 | *Laccaria murina* | Korea, Jeju-do | - | MG519552 | MG519592 | MG551625 | MG551658 |
| SFC20120919-81 | *Laccaria vinaceoavellanea* | Korea, Chungcheongnam-do | - | MG519534 | MG519577 | MG551609 | - |
| SFC20150810-10 | *Laccaria vinaceoavellanea* | Korea, Soul, Gwanak-gu | - | MG519539 | MG519580 | MG551614 | MG551646 |
| TPML20120912-40 | *Laccaria araneosa* | Korea, Gyeongsangbuk-do | - | MG519548 | MG519588 | MG551621 | MG551654 |
| SFC20130917-21 | *Laccaria araneosa* | Korea, Gyeongsangbuk-do | - | MG519549 | MG519589 | MG551622 | MG551655 |
| SFC20120919-05 | *Laccaria parva* | Korea, Soul, Gwanak-gu | - | MG519529 | MG519573 | MG551604 | MG551640 |
| ASIS21282 | *Laccaria parva* | Korea, Gyeonggi-do |  - | MG519526 | MG519571 | MG551601 | MG551638 |
| SFC20150902-17 | *Laccaria torosa* | Korea, Gyeongsangbuk-do | - | MG519561 | MG519598 | MG551631 | MG551664 |
| SFC20121010-51 | *Laccaria versiforma* | Korea, Gyeongsangbuk-do | - | MG519555 | MG519593 | MG551626 | MG551659 |
| SFC20120926-01 | *Laccaria versiforma* | Korea, Gyeongsangbuk-do | - | MG519556 | MG519594 | MG551627 | MG551660 |
| F1102432 | *Laccaria amethystea* | CostaRica | Quercus  | KU685638 | KU685781 | KU686062 | - |
| F1102433 | *Laccaria gomezii* | CostaRica | Quercus | - | **MT279205** | **MT431180** | **-** |
| F1102471 | *Laccaria major* | CostaRica, San Jose | Quercus  | **MT279224** | **-** | - | - |
| F1104722 | *Laccaria calospora* | CostaRica | Quercus  | KU685639 | KU685782 | - | - |
| F1111951 | *Laccaria trichodermophora* | CostaRica | Quercus  | KU685640 | KU685784 | KU686063 | - |
| F1112018 | *Laccaria amethystina* | CostaRica | Quercus  | **MT279225** | **-** | - | - |
| GMM6012 | *Laccaria major* | Costa Rica | Quercus | KU685758 | KU685909 | KU686057 | -  |
| GMM6013 | *Laccaria ohiensis* | CostaRica, San Jose | Quercus | **MT279226** | **MT279206** | **MT431181** | **MT436070** |
| GMM6019 | *Laccaria major* | CostaRica, San Gerardo | Quercus | KU685757 | KU685908 | KU686056 | KU686160 |
| GMM6020 | *Laccaria major* | CostaRica, San Gerardo | Quercus | **KM067854 / JX504149** | **JX504223** | **-** | - |
| GMM7173 | *Laccaria gomezii* | - | - | **MT279227** | **MT279207** | **MT431182** | **MT436071** |
| GMM6021 | *Laccaria gomezii* | - | - | **MT279228** | **-** | - | - |
| GMM6022 | *Laccaria gomezii* | - | - | KU685644 | - | - | - |
| GMM6023 | *Laccaria ohiensis* | CostaRica, San Gerardo | Quercus | **MT279229** | **MT279208** | **MT431183** | **MT436072** |
| GMM6585 | *Laccaria* sp. | CostaRica, San Gerardo | Quercus | KU685647 | KU685791 | KU685933 | - |
| SYC109 | *Laccaria stellata* | Panama, Fortuna | *Quercus insignis* | KP877340 | - | - | - |
| SYC702 | *Laccaria stellata* | Panama, Fortuna | *Quercus insignis* | KP877339 |  - | - | - |
| DM121 | *Laccaria squarrosa* | Mexico: Veracruz | *Fagus grandifolia* | MF669960 | MF669967 | - | - |
| DM63 | *Laccaria squarrosa* TYPE | Mexico: Veracruz | *Fagus grandifolia* | MF669958 | MF669965 | - | - |
| DM93 | *Laccaria squarrosa* | Mexico: Veracruz | *Fagus grandifolia* | MF669959 | MF669966 | - | - |
| VB4678 | *Laccaria roseoalbescens* | Mexico | *Quercus, Carpinus* | KJ590509 | KJ590510 | - | - |
| PG03 | *Laccaria roseoalbescens* | Mexico | *Quercus, Carpinus* | KJ874329 | KJ874332 | - | - |
| LM5042 | *Laccaria roseoalbescens* | Mexico | *Quercus, Carpinus* | KJ874327 | KJ874330 | - | - |
| LM5099 | *Laccaria roseoalbescens* | Mexico | *Quercus, Carpinus* | KJ874328 | KJ874331 | - | - |
| VB4677 | *Laccaria roseoalbescens* | Mexico | *Quercus, Carpinus* | KJ590508 | KJ590511 | - | - |
| GMM6016 | *Laccaria ohiensis* | CostaRica, San Jose | *Quercus* | **MT279230** | **MT279209** | **MT431184** | **MT436073** |
| Corrales\_27 | *Laccaria stellata* | Panama | *Oreomunnea mexicana* | **MT279231** | **MT279210** | **MT431185** |  - |
| Corrales\_576 | *Laccaria stellata* | Panama | *Oreomunnea mexicana* | **MT279232** | **-** | - | - |
| Corrales\_467 | ***Laccaria nitrophila*** | Panama | *Oreomunnea mexicana* | **MT279233** | **-** | - | - |
| Corrales\_547 | ***Laccaria nitrophila*** | Panama | *Oreomunnea mexicana* | **MT279234** | **-** | - | - |
| Corrales\_423 | ***Laccaria nitrophila*** | Panama | *Oreomunnea mexicana* | **MT279235** | **-** | - | - |
| Corrales\_595 | ***Laccaria nitrophila*** | Panama (TYPE) | *Oreomunnea mexicana* | **MT279236** | **MT279211** | **MT431186** | **MT436074** |
| Corrales\_646 | ***Laccaria dallingii*** | Panama | *Oreomunnea mexicana* | **MT279237** | **MT279212** | **-** | **MT436075** |
| Corrales\_543 | ***Laccaria dallingii*** | Panama | *Oreomunnea mexicana* | **MT279238** | **MT279213** | **MT431187** | **MT436076** |
| Corrales\_457 | ***Laccaria dallingii*** | Panama | *Oreomunnea mexicana* | **MT279239** | **-** | - | - |
| Corrales\_571 | ***Laccaria dallingii*** | Panama (TYPE) | *Oreomunnea mexicana* | **MT279240** | **MT279214** | **-** | - |
| Corrales\_397 | ***Laccaria dallingii*** | Panama | *Oreomunnea mexicana* | **MT279241** |  - | - | - |
| Corrales\_262 | ***Laccaria dallingii*** | Panama | *Oreomunnea mexicana* | **MT279242** | **-** | - | - |
| Ovrebo 5293 | ***Laccaria dallingii*** | Panama | *Oreomunnea mexicana* | **MT279243** | **-** | - | - |
| Corrales\_268 | *Laccaria* PAN3 | Panama | *Oreomunnea mexicana* | **MT279244** | **MT279215** | **MT431188** | **MT436077** |
| Corrales\_25 | ***Laccaria*** [***fortunensis***](http://www.mycobank.org/BioloMICSDetails.aspx?Rec=579956) | Panama | Oreomunnea mexicana | **MT279245** | **-** | - | - |
| Corrales\_74 | ***Laccaria*** [***fortunensis***](http://www.mycobank.org/BioloMICSDetails.aspx?Rec=579956) | Panama (TYPE) | Oreomunnea mexicana | **MT279246** | **-** | - | - |
| Corrales\_75 | ***Laccaria*** [***fortunensis***](http://www.mycobank.org/BioloMICSDetails.aspx?Rec=579956) | Panama | Oreomunnea mexicana | **MT279247** | **-** | - | - |
| Corrales\_274 | *Laccaria* aff. *roseoalbescens2* | Panama | Oreomunnea mexicana | **MT279248** | **MT279216** | **-** | **MT436078** |
| Corrales\_70 | *Laccaria* aff. *roseoalbescens2* | Panama | Oreomunnea mexicana | **MT279249** | **MT279217** | **-** | **MT436079** |
| Ovrebo5332 | *Laccaria* aff. *roseoalbescens1* | Panama | Oreomunnea mexicana | **MT279250** | **MT279218** | **-** | **MT436080** |
| Corales\_676A | *Laccaria* sp. | Panama | Oreomunnea mexicana |  - | **MT279219** |  - | - |
| O\_mexicana\_roots | *Laccaria* sp. | Panama | Oreomunnea mexicana | KM595030 | - | - | - |
| O\_mexicana\_roots | *Laccaria* sp. | Panama | Oreomunnea mexicana | KM594869 | - | - | - |
| O\_mexicana\_roots | *Laccaria* sp. | Panama | Oreomunnea mexicana | KM594870 | - | - | - |
| O\_mexicana\_roots | *Laccaria* sp. | Panama | Oreomunnea mexicana | KM594892 | - | - | - |
| O\_mexicana\_roots | *Laccaria* sp. | Panama | Oreomunnea mexicana | KM594912 | - | - | - |
| O\_mexicana\_roots | *Laccaria* sp. | Panama | Oreomunnea mexicana | KM594925 | - | - | - |
| O\_mexicana\_roots | *Laccaria* sp. | Panama | Oreomunnea mexicana | KM595045 | - | - | - |
| O\_mexicana\_roots | *Laccaria* sp. | Panama | Oreomunnea mexicana | KM594950 | - | - | - |
| O\_mexicana\_roots | *Laccaria* sp. | Panama | Oreomunnea mexicana | KM594954 | - | - | - |
| O\_mexicana\_roots | *Laccaria* sp. | Panama | Oreomunnea mexicana | KM595048 | - | - | - |
| O\_mexicana\_roots | *Laccaria* sp. | Panama | Oreomunnea mexicana | KM594962 | - | - | - |
| O\_mexicana\_roots | *Laccaria* sp. | Panama | Oreomunnea mexicana | KM594997 | - | - | - |
| O\_mexicana\_roots | *Laccaria* sp. | Panama | Oreomunnea mexicana | KM595049 | - | - | - |
| O\_mexicana\_roots | *Laccaria* sp. | Panama | Oreomunnea mexicana | KM594982 | - | - | - |
| O\_mexicana\_roots | *Laccaria* sp. | Panama | Oreomunnea mexicana | KM594835 | - | - | - |
| O\_mexicana\_roots | *Laccaria* sp. | Panama | Oreomunnea mexicana | KM594848 | - | - | - |
| O\_mexicana\_roots | *Laccaria* sp. | Panama | Oreomunnea mexicana | KM594856 | - | - | - |
| GMM7402 | *Laccaria* Q1 | Queensland | Allocasuarina, Eucalyptus | KU685688 | KU685832 | KU685974 | KU686106 |
| GMM7403 | *Laccaria* Q1 | Queensland | Allocasuarina, Eucalyptus | KU685689 | KU685833 | KU685975 | KU686107 |



Figure S1.

ITS only dataset using RAxML analysis with 1000 bootstrap replicates. NTAX = 166. Colored terminals identify *Laccaria* species from Panama. Blue *L.*

[*fortunensis*](http://www.mycobank.org/BioloMICSDetails.aspx?Rec=579956); purple *L. dallingii*; orange *L. nitrophilous*; red *L. roseoalbescens*; dark green *L. stellata*; light green *Laccaria* ECM from *Oreomunnea mexicana* roots.



Figure S2.

28S only dataset using RAxML analysis with 1000 bootstrap replicates. NTAX = 110. Colored terminals identify *Laccaria* species from Panama. Blue *L. fortunensis*; purple *L. dallingii*; orange *L. nitrophilous*; red *L. roseoalbescens*; green *L. stellata*.



Figure S3.

RPB2 only dataset using RAxML analysis with 1000 bootstrap replicates. NTAX = 83. Colored terminals identify *Laccaria* species from Panama. Blue *L. fortunensis*; purple *L. dallingii*; orange *L. nitrophilous*; red *L. roseoalbescens*; green *L. stellata*.



Figure S4.

EF1a only dataset using RAxML analysis with 1000 bootstrap replicates. NTAX = 58. Colored terminals identify *Laccaria* species from Panama. Blue *L. fortunensis*; purple *L. dallingii*; orange *L. nitrophilous*; red *L. roseoalbescens*.

*Laccaria* of Panama Combined Dataset. Aligned in FASTA gapped format.

>A0051\_Laccaria\_sp\_JAPAN\_KU685613\_\_\_

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>AWW251\_Laccaria\_\_MALAYSIA\_JX504093\_JX504177\_\_

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CCTGA-TGTGGCTGTTAGCTGGC-TTTTCGAAGCATGTGCTCGT-CCGTCATCTTTAATCTCT--CCA-CCTGTGCACATTTTGTAGTCTTT-GGATACCTCTCGAGGCAA-CTCGGATA----TTAG-GATTGCCGTGC---TGT---ACAAGTCGGCTTTTCTTTCATTTCC-AAGACTATGTTTT----T--A-TATACC-CCAAAGTATGTTTAAAGAATGTCATC-AATGGGAAC---TTGTTTCCTA--T-AAAATTATACAACTTTCAGCAACGGATCTCTTGGCTCTCGCATCGATGAAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTCAGTGAATCATCGAATCTTTGAACGCACCTTGCGCTCCTTGGTATTCCGAGGAGCATGCCTGTTTGAGTGTCATTAAA-TTCTCAA-CCTTCCAGC--------T-TTTATTAGCTTGG--TTAGGCTTGGA-TGT-GGGGG--TTGCGGGCTTC-AT-----C---AATGAGGTCGGCTCTCCTTAAATGCATTAGCGGAACTTTTGTGGACCGTCTA-TTGGTGTGAT-AATTATCTACGCCGTGGAT-GTAAAGCAG-CTTTAT---AAAGTT-CAGCTTCT-AACCGTCC---ATTGACTTGGACAA-----TTTTGACAA-TTTGAAAGCTCAAATTTAAAATCTGGCAGT-CTTTGGCTGT-CCGAGTTGTAATCTAGAGAAGTATTATCCGCGCTGGACCGTGTACAAGTCTCCTGGAATGGAGCGTCATAGAGGGTGAGAATCCCGTCTTTGACACGGACTGCCAGGGC-TTTGTGATGTGCTCTCGAAGAGTCGAGTTGTTTGGGAATGCAGCTCAAAATGGGTGGTAAATTCCATCTAAAGCTAAATATTGGCGAGAGACCGATAGCGAACAAGTACCGTGAGGGAAAGATGAAAAGAACTTTGGAAAGAGAGTTAAACAGTACGTGAAATTGCTGAAAGGGAAACGCTTGAAGTCAGTCGCGTTGGCCAGGGATCAA-CCTTGC----TTTTTT---GCTTGGCTTACTTTCTGGTCGATGGG-TCAGCATCAATTTTGACTGGTGG-AAAAAGTTCAAGGGAATGTGGCAT-CTTCGGATGTGTTATAGCCTTTGTTCACATATATCAGTTGGGATTGAGGAACTCAGCACGCCGCAAGGCCGGG---TTTTTAACCACGTACGTGCTTAGGATGCTGGCATAATGGCTTTAATCGACCCGTCTTGAAACACGGACCAAGGAGTCTAACATGCCTGCGAGTGTTTGGGTGAAAAACCCGAGCGCGTAATGAAAGTG-AAAGTTGAGATCCCTGTCGTGGGGAGCATTGACGCCCGGATCTGACCTTTTGTGACGATTCTGCGGTAAAGCATGTTTTTCGCATGCTTTTCCGAAAGTTGACCAAGGACGTTTATCGTTATCTACAAAAGgttgctgaccttcgctcaagtgccatgagatgagatgtgctga-cccctct---tcttcagTGCGTCGAGACCCACAAGGAGTTCAACCTTGCCCTTGCAGTTAAGCATCAAACCATCACAAACGGCCTCAAATACTCTCTGGCGACAGGTAACTGGGGAGATCAGAAAAAGTCAATGTCTTCCAAAGCAGGAGTATCTCAGGTCTTGAACAGATRCACATATGCATCCACTCTATCACATCTTCGTCGGTGTAACACTCCTCTAGGGCGCGAAGGCAAGATCGCCAAACCTCGTCAGTTGCACAACACTCATTGGGGTATGGTGTGTCCTGCCGAAACTCCTGAAGGTCAAGCCTGTGGTCTTGTCAAGAACCTCGCCCTTATGGCGTGCATATCAGTCGGGTCTTACTCTGCGCCCGTTATCGAGTTTTTGGAGGAGTGGGGATTGGAGTCATTGGAAGAGAACGCGCACTCATCAACACCTTGCACAAAAGTTTTCGTGAACGGTGTCTGGATGGGTGTGCATCGCGATCCTGCCAATTTGGTGAAGACGATAAAGAAATTGAGAAGGAAAGACGATATTAGCCCAGAAGTGTCAGTTGTGAGAGACATCAGGGAGAAGGAATTGAGGTTGTATACCGATGCTGGACGTGTTTGTCGACCACTCTTCATCGTCGAGAACCAACAGCTGGCACTTCAGAAGAAGCATGTCAAATGG------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

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>AWW591\_Laccaria\_sp\_USA\_OR\_KM067830\_28S\_RPB2\_

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>Cripps1625\_Laccaria\_pseudomontana\_TYPE\_USA\_CO\_DQ149871\_\_\_

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>Cripps1771\_Laccaria\_pseudomontana\_USA\_CO\_DQ149870\_\_\_

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>LaAM/08/1\_Laccaria\_amethystina\_JGI Genome\_ITS\_28S\_RPB2\_EF1a

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>MB\_FB\_001107\_Laccaria\_yunnanensis\_CHINA\_JQ670897\_\_\_

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>MB\_FB\_001109\_Laccaria\_aurantia\_CHINA\_JQ681209\_\_\_

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>MB\_FB\_001110\_Laccaria\_fulvogrisea\_CHINA\_JQ681210\_\_\_

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>PRL3777\_Laccaria\_ochropurpurea\_USA\_IL\_KU685732\_JX504246\_KU686024\_

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>PRL4777\_Laccaria\_ochropurpurea\_USA\_IL\_KU685733\_KU685883\_KU686025\_

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>S238N\_Laccaria \_bicolor\_USA\_OR\_DQ179123\_\_XM001873347\_XM001873347

CCTGA-TGTGATTGTTAGCTGGC-TTTTCGAAGCATGTGCTCAT-CCGTCATCTTT-ATCTCT--CCA-CCTGTGCACATTTTGTAGTC-TT-GGATACCTCTCGAGGAAA-CTCGGATT----TTAG-AATCGCTGTGC---TGT---ACAAGTCGGCTTTTCTTTCATTTCC-AAGACTATGTTTT----T--A-TATACA-CCAAAGTATGTTTATAGAATGTCATC-AATGGGAAC---TTGTTTCCTA--T-AAAATTATACAACCTTCAGCAACGGATCTCTTGGCTCTCGCATCGATGAAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTCAGTGAATCATCGAATCTTTGAACGCACCTTGCGCTCCTTGGTATTCCGAGGAGCATGCCTGTTTGAGTGTCATTAAA-TTCTCAA-CCTTCCAAC--------T-TTTATTAGCTTGG--TTAGGCTTGGA-TGT-GGGGG--TTGCGGGCTTC-AT-----T---AATGAGGTCGGCTCTCCTTAAATGCATTAGCGGAACTTTTGT-GACCGTCTA-TTGGTGTGAT-AATTATCTACGCCGTGGAT-GTGAAGCAG-CTTTAT---GAAGTTCCTGCTTCT-AACCGTCC---ATTGACTTGGACAA-----TTTTGATAA--TTGA--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------TTTCCGCATGCTTTTCCGAAAGTTGACCAAGGACGTTTATCGTTATCTACAAAA-------------------------------------------------------------GTGCGTCGAGACCCATAAGGAGTTCAACCTTGCCCTTGCAGTTAAGCATCAAACCATCACAAACGGCCTCAAATACTCTCTGGCGACAGGTAACTGGGGGGATCAGAAAAAGTCAATGTCTTCCAAGGCAGGAGTATCTCAGGTCTTGAACAGATACACATATGCATCCACTCTGTCACATCTTCGTCGGTGTAACACTCCTCTAGGGCGCGAAGGCAAGATCGCCAAACCTCGTCAGTTGCACAACACCCATTGGGGTATGGTGTGCCCTGCGGAAACCCCTGAAGGTCAAGCCTGTGGTCTTGTCAAGAACCTCGCCCTTATGGCGTGCATATCAGTCGGGTCTTACTCCGCGCCCGTTATCGAGTTTTTGGAGGAATGGGGATTGGAGTCATTGGAAGAGAACGCGCACTCATCAACTCCCTGCACAAAAGTTTTCGTGAACGGTGTATGGATGGGTGTGCATCGCGATCCTGCCAACTTGGTGAAGACGATAAAGAAATTGAGAAGGAAAGACGACATTAGCCCTGAAGTGTCAGTTGTGCGAGACATCCGAGAGAAGGAATTGAGGTTGTACACCGATGCTGGACGTGTTTGTCGACCACTTTTCATCGTCGAGAACCAACAGCTGGCACTTCAGAAGAAGCACGTCAAATGGCTCAGTAACGGCCTCAACGATGATGGCGACGAATACAAATGGGAACATCTGGTAAAGGGTGGCATCATTGAGTTACTGGATGCTGAGGAAGAGGAAACGGTGATGATATCCATGACTCCTGAAGATCTTGAAAATTCTCGCCTACAGCAAAGTGGCGTTGATCTTCACGCGAACGACGGCGAGTTTGATCCAGCAGCCCGATTAAAGGCTGGCACTCACGCACACACATGGACACATTGCGAAATTCATCCTAGCATGATTCTTGGCATTTGTGCCAGCATTATTCCTTTCCCCGATCATCTGCGCCATTCTCATCATTGCTGGTGGTACTGGTGAGTTTGAGGCTGGTATCTCCAAGGATGGCCAGACCCGCGAGCACGCTCTCCTCGCTTTCACCCTCGGTGTGCGGCAACTCATCGTTGCCGTCAACAAGATGGACACCACCA-----------------------------------------------------------AGTGGAGCGAGGACCGTTTCAACGAAATTATCAAGGAGACGTCAAGCTTCATCAAGAAGGTTGGTTACAACCCCAAGGCCGTTGCCTTTGTTCCTATTTCCGGCTGGCACGGTGACAACATGTTGGAGGAGTCCCCT------------------------------------------------------AACATGCCTTGGTTCAAGGGCTGGACCAAGGAGACCAAGGCTGGTGTCGTCAAGGGCAAGACCCTCCTCGATGCTATTGATGCCATTGAGCCCCCCGTCCGACCTTCCGACAAGCCCCTCCGTCTTCCCCTCCAGGACGTCTACAAAATTGGCGGTATCGGAACTGTGCCCGTCGGTCGTGTTGAGACTGGTATCATCAAGGCCGGAATGGTCGTCAATTTCGCTCCCTCCAACGTCACCACTGAAGTCAAGTCCGTCGAAATGCATCACGAACAGCTCGAGCAGGGTAACCCCGGTGACAATGTCGGTTTCAACGTCAAGAACGTGTCAGTGAAGGATATTCGTCGTGGCAACGTGGCCTCCGACTCCAAGAACGATCCCGCCAAGGAAGCGGCCTCTTTCAACGCACAGGTCATCGTCCTCAACCACCCTGGTCAAATTGGTGCTGGTTATGCCCCGGTTCTCGACTGTCACACCGCCCACATTGCCTGCAAGTTCGCCGAGCTCATCGAGAAGATCGATCGTCGTACGGGTAAATCCATTGAAAACTCACCCAAATTCGTCAAGTCGGGTGACGCCTGCATCGTCAAGCTCGTTCCCAGCAAGCCTATG

>MS\_13\_Laccaria\_rubroalba\_CHINA\_KX449360\_\_\_

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>MS\_28\_Laccaria\_rubroalba\_CHINA\_KX449359\_\_\_

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>MS\_15\_Laccaria\_rubroalba\_CHINA\_KX449358\_\_\_

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TCTGA-TGTGGCTGTTAGCTGGCTTTTTTGAAGCATGTGCTCGT-CCGTCATCTTT-ATATCT--CCA-CCTGTGCACATTTTGTAGTC-TT-GGATACCTCTCGAGGCAA-CTCGGATT----TAAG-GATC------------------GTGTTGGCTTTCCTTTCACTTCC-AAGACTATGTTTT----T--A-TATACA-CCAAAGTATGTTTAAAGAATGTCATC-AATAGGAAC---TTGTTTCCTA--TAAAAACTATACAACTTTCAGCAACGGATCTCTTGGCTCTCGCATCGATGAAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTCAGTGAATCATCGAATCTTTGAACGCACCTTGCGCTCCTTGGTATTCCGAGGAGCATGCCTGTTTGAGTGTCATTAAA-TTCTCAA-CCTTCCAGC--------T-TTTATTAGCTTGG--TTAGGCTTGGA-TGT-GGGGG--TTGCAGGCTTC-AT-----T---ATTGAGGTCAGCTCTCCTTAAATGCATTAGCGGAACTTTTGTGGACCGTCTA-TTGGTGTGAT-AATTATCTACGCCGTGGAT-GTGAAGCAG-CTTTAT---AAAGTT-CAGCTTCT-AACCGTCC---ATTGACTTGGACAA---TTTTATGACAA-TTTGA-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

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>GMM6012\_Laccaria\_major\_COSTA\_RICA\_KU685758\_KU685909\_KU686057\_

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>VB4678\_Laccaria\_roseoalbescens\_MEXICO\_KJ590509\_KJ590510\_\_

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>LM5099\_Laccaria \_roseoalbescens\_MEXICO\_KJ874328\_KJ874331\_\_

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>VB4677\_Laccaria \_roseoalbescens\_MEXICO\_KJ590508\_KJ590511\_\_

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>GMM6016\_Laccaria\_ohiensis\_COSTA\_RICA\_GMM6016\_GMM6016\_GMM6016\_GMM6016

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>Corrales\_27\_Laccaria\_stellata\_PANAMA\_ITS\_28S\_RPB2\_

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>Corrales\_576\_Laccaria\_stellata\_PANAMA\_ITS\_\_\_

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>Corrales\_467\_Laccaria\_PAN1\_PANAMA\_ITS\_\_\_

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>Corrales\_547\_Laccaria\_PAN1\_PANAMA\_ITS\_\_\_

--------------------------------------------------------------------------GCACATTTTGTAGTC-TT-GGATACCTCTCGAGGCAA-CTCGGATT----TTAG-GATCGCT---------------AAGTCAGCTTTCCTTTCATTTCC-AAGACTATGTTTT-----TTA-TATACA-CCAAAGTATGTTTAAAGAATGTCATN-AATAGGAAC---TTGTTTCCTA--T-AAAATTATACAACTTTCAGCAACGGATCTCTTGGCTCTCGCATCGATGAAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTCAGTGAATCATCGAATCTTTGAACGCACCTTGCGCTCCTTGGTATTCCGAGGAGCATGCCTGTTTGAGTGTCATTAAA-TTCTCAA-CCTTCCAGC--------T-TTTATTAGCTTGG--TTAGGCTTGGA-TGT-GGGGG--TTGCAGGCTTC-AN-----T---AGTGAGGTCGGCTCTCCTTAAATGCATTAGTGGAACTTTTGTGAACCATCTA-TTGGTGTGAT-AATTATCTACGCCGTGGAT-GTGAAGCAG-CTTT-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

>Corrales\_423\_Laccaria\_PAN1\_PANAMA\_ITS1F\_\_\_

---------------------------------------------------------------------------------------------------------------------------------------T---------------AAGTCAGCTTTCCTTTCATTTCC-AAGACTATGTTTT----TTTA-TATACA-CCAAAGTATGTTTAAAGAATGTCATC-AATAGGAAC---TTGTTTCCTA--T-AAAATTATACAACTTTCAGCAACGGATCTCTTGGCTCTCGCATCGATGAAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTCAGTGAATCATCGAATCTTTGAACGCACCTTGCGCTCCTTGGTATTCCGAGGAGCATGCCTGTTTGAGTGTCATTAAA-TTCTCAA-CCTTCCAGC--------T-TTTATTAGCTTGG--TTAGGCTTGGA-TGT-GGGGG--TTGCAGGCTTC-AT-----T---AGTGA----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

>Corrales\_595\_Laccaria\_PAN1\_PANAMA\_ITS4B\_28S\_6f\_EF1a

-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------GGCTCTCGCATCGATGAAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTCAGTGAATCATCGAATCTTTGAACGCACCTTGCGCTCCTTGGTATTCCGAGGAGCATGCCTGTTTGAGTGTCATTAAA-TTCTCAA-CCTTCCAGC--------T-TTTATTAGCTTGG--TTAGGCTTGGA-TGT-GGGGG--TTGCAGGCTTC-AT-----T---AGTGAGGTCGGCTCTCCTTAAATGCATTAGTGGAACTTTTGTGAACCATCTA-TTGGTGTGAT-AATTATCTACGCCGTGGAT-GTGAAGCAG-CTTTTAT--GAAGTT-CAGCTTCT-AACCGTCC---ATTGACTTGGACAA-----TTTTGACAA-TTTGAAAGCTCAAATTTAAAATCTGGCAGT-CTT-GGCTGT-CCGAGTTGTAATCTAGAGAAGTATTATCCGCGCTGGACCGTGTACAAGTCTCCTGGAATGGAGCGTCATAGAGGGTGAGAATCCCGTCTTTGACACGGACTGCCAGGGCTTT-GTGATGTGCTCTCAAAGAGTCGAGTTGTTTGGGAATGCAGCTCAAAATGGGTGGTAAATTCCATCTAAAGCTAAATATTGGCGAGAGACCGATAGCGAACAAGTACCGTGAGGGAAAGATGAAAAGAACTTTGGAAAGAGAGTTAAACAGTACGTGAAATTGCTGAAAGGGAAACGCTTGAAGTCAGTCGCGTTGGCCAGGGATCAA-CCCTGC----ATTTTT---GCTTGGCTTACTTTCTGGTCAACGGG-TCAGCATCAATTTTGACTGGTGG-AAAAAGTTCAAGGGAATGTGGCAT-CTTCGGATGTGTTATAGCCTTTGTTCGCATACATTGGTTGGGATTGAGGAACTCAGCACGCCGCAAGGCCGGG---TTTTTAACCACGTACGTGCTTAGGATGCTGGCATAATGGCTTTAATCGACCCGTCTTGAAACACGGACCAAGGAGTCTAACATGCCTGCGAGTGTTTGGGTGAAAAACCCGAGTGCGTAATGAAAGTG-AAAGTTGAGATCCCTGTCGTGGGGAGCATTGACGCCCGGATCTGACCTTTTGTGACGATTCTGCGGTAGAGCATGT------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------AGGAAACAGTGATGATATCCATGACTCCTGAAGATCTTGAAAATTCTCGCCTACAGCAAAGTGGTGTTGATCCTCACGCGAACGATGGCGAGTTTGATCCAGCAGCTCGATTGAAGGCTGGCACTCATGCACACACATGGACACATTGCGAAATCCATCCTAGCATGATTCTTGGCATTTGTGCTAGCATTATTCCTTTCCCAGATCAT-----------------------------------------------------------------------------------------------------------------------TTGCCGTCAACAAGATGGATACCACTAAGGTAAGAAACTTTTCAG-TGATAGTTAGGCCTCTTGCACATTCTCATCATCTTAT-GTAGTGGAGCGAGGACCGTTTCAACGAAATCATCAAGGAGACGTCAACCTTCATCAAGAAGGTTGGTTACAACCCCAAGGCCGTTGCCTTTGTCCCTATTTCCGGCTGGCACGGTGACAACATGTTGGAGGAGTCCTCTAAGTAAGCAATC--TCGTGTTGTCATAGT-GTCCCGTCGCTCATGTTGCACAC-AGCATGCCTTGGTACAAGGGTTGGACCAAGGAGACCAAGGCTGGTGTTGTCAAGGGCAAGACCCTCCTCGATGCTATTGATGCCATTGAGCCTCCCGTCCGACCTTCCGACAAACCCCTCCGTCTCCCCCTCCAGGATGTCTACAAAATTGGCGGTATCGGAACTGTGCCCGTCGGCCGTGTTGAGACTGGCATCATCAAAGCCGGAATGGTCGTCACTTTCGCTCCCTCGAACGTCACAACTGAAGTCAAGTCCGTCGAAATGCATCACGAACAGCTCGAGCAGGGTAACCCTGGTGACAATGTCGGTTTCAACGTCAAGAACGTGTCGGTGAAGG-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

>Corrales\_646\_Laccaria\_PAN2\_PANAMA\_ITS\_28S\_\_2218R

CCTGA-TGTGGCTGTTAGCTGGC-TTTTTGAAGCATGTGCTCGTCCCGTCATCTTT-ATCTCT--CCA-CCTGTGAACATTTTGTAGTC-TT-GAATACCTCTTGAGGCAA-CTCGGGTTAGGGTTAG-GATTGCCGTGC---TGT---ACAAGCAGGCTTTCTTATCATTTTC-AAGACTATGTTTT---TTTAA-TATACA-CCAAAGCATGTTTAAAGAATGTCATC-AATAGGAAC---TTGTTTCCTA--T-AAAATTATACAACTTTCAGCAACGGATCTCTTGGCTCTCGCATCGATGAAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTCAGTGAATCATCGAATCTTTGAACGCACCTTGCGCTCCTTGGTATTCCGAGGAGCATGCCTGTTTGAGTGTCATTAAA-TTCTCAA-CCTTCCAGC--------T-TTTATTAGCTTGG--TTAGGCTTGGA-TGT-GGGGG--TTGTGGGCTTC-AT-----T---ATTGAGGTCAGCTCTCCTTAAATGCATTAGCAGAACTTTTGTGGACTGTCTA-TTGGTGTGAT-AATTATCTACGCCGTGGAT-GTGAAGCAG-ATTTAT---GAAGTT-CAGCTTCC-AACNGTCC---ATTGACATGGACAA-----TTTTGACAA-TTTGAAAGCTCAAATTTAAAATCTGGCAGT-CTTTGGCTGT-CCGAGTTGTAATCTAGAGAAGTATTATCCGCGCTGGACCGTGTACAAGTCTCCTGGAATGGGGCGTCATAGAGGGTGAGAATCCCGTCTTTGACACGGACTGCCAGGGCTTT-GTGATGTGCTCTCGAAGAGTCGAGTTGTTTGGGAATGCAGCTCAAAATGGGTGGTAAATTCCATCTAAAGCTAAATATTGGCGAGAGACCGATAGCGAACAAGTACCGTGAGGGAAAGATGAAAAGAACTTTGGAAAGAGAGTTAAACAGTACGTGAAATTGCTGAAAGGGAAACGCTTGAAGTCAGTCGCGTTGGCCAGGGATCAA-CCTTGC----TTTTTT---GCTTGGCTTACTTTCTGGTCGATGGG-TCAGCATCAATTTTGACTGGTGG-AAAAAGTTCAAGGGAATGTGGCAT-CTTCGGATGTGTTATAGCCTTTGTTCGCATACATTGGTTGGGATTGAGGAACTCAGCACGCCGCAAGGCCGGG---TTTTTAACCACGTACGTGCTTAGGATGCTGGCATAATGGCTTTAATCGACCCGTCTTGAAACACGGACCAAGGAGTCTAACATGCCTGCAAGTGTTTGGGTGAAAAACCCGAGCGCGTAATGAAAGTG-AAAGTTGAGATCCCTGTCGTAGGGAACATTGACGCCCGGATCTGACCTTTTGTGACGATTCTGCGGTAGAGCATGT------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------TTCGACCTTCCGACAAACCCCTCCGTCTCCCCCTCCAGGATGTCTACAAAATTGGTGGTATTGGAACTGTGCCTGTCGGTCGTGTTGAGACTGGTATCATCAAGGCCGGAATGGTCGTCACTTTCGCTCCCTCCAACGTCACCACTGAAGTCAAGTCCGTCGAAATGCATCACGAACAGCTCGAACAGGGTAACCCTGGTGACAATGTCGGTTTCAACGTCAAGAACGTGTCAGTGAAGGATATTCGTCGTGGCAACGTGGCCTCTGACTCCAAGAACGATCCCGCCAAGGAAGCGGCTTCTTTCAACGCACAGGTCATCGTCCTCAACCACCCTGGTCAAATTGGTGCTGGTTACGCCCCAGTTCTCGACTGTCACACCGCCCACATCGCCTGCAAGTTCGCCGAGCTCATCGAGAAGATCGATCGTCGTACGGGTAAATCCATTGAAAA----------------------------------------------------------------

>Corrales\_543\_Laccaria\_PAN2\_PANAMA\_ITS\_28S\_RPB2\_EF1a

CCTGA-TGTGGCTGTTAGCTGGC-TTTTTGAAGCATGTGCTCGTCCCGTCATCTTT-ATCTCT--CCA-CCTGTGAACATTTTGTAGTC-TT-GAATACCTCTTGAGGCAA-CTCGGGTTAGGGTTAG-GATTGCCGTGC---TGT---ACAAGCAGGCTTTCTTATCATTTTC-AAGACTATGTTTT--TTTTAA-TATACA-CCAAAGCATGTTTAAAGAATGTCATC-AATAGGAAC---TTGTTTCCTA--T-AAAATTATACAACTTTCAGCAACGGATCTCTTGGCTCTCGCATCGATGAAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTCAGTGAATCATCGAATCTTTGAACGCACCTTGCGCTCCTTGGTATTCCGAGGAGCATGCCTGTTTGAGTGTCATTAAA-TTCTCAA-CCTTCCAGC--------T-TTTATTAGCTTGG--TTAGGCTTGGA-TGT-GGGGG--TTGTGGGCTTC-AT-----T---ATTGAGGTCAGCTCTCCTTAAATGCATTAGCAGAACTTTTGTGGACTGTCTA-TTGGTGTGAT-AATTATCTACGCCGTGGAT-GTGAAGCAG-ATTTAT---GAAGTT-CAGCTTCC-AACCGTCC---ATTGACATGGACAA-----TTTTGACAA-TTTGAAAGCTCAAATTTAAAATCTGGCAGT-CTTTGGCTGT-CCGAGTTGTAATCTAGAGAAGTATTATCCGCGCTGGACCGTGTACAAGTCTCCTGGAATGGGGCGTCATAGAGGGTGAGAATCCCGTCTTTGACACGGACTGCCAGGGCTTT-GTGATGTGCTCTCGAAGAGTCGAGTTGTTTGGGAATGCAGCTCAAAATGGGTGGTAAATTCCATCTAAAGCTAAATATTGGCGAGAGACCGATAGCGAACAAGTACCGTGAGGGAAAGATGAAAAGAACTTTGGAAAGAGAGTTAAACAGTACGTGAAATTGCTGAAAGGGAAACGCTTGAAGTCAGTCGCGTTGGCCAGGGATCAA-CCTTGC----TTTTTT---GCTTGGCTTACTTTCTGGTCGATGGG-TCAGCATCAATTTTGACTGGTGG-AAAAAGTTCAAGGGAATGTGGCAT-CTTCGGATGTGTTATAGCCTTTGTTCGCATACATTGGTTGGGATTGAGGAACTCAGCACGCCGCAAGGCCGGG---TTTTTAACCACGTACGTGCTTAGGATGCTGGCATAATGGCTTTAATCGACCCGTCTTGAAACACGGACCAAGGAGTCTAACATGCCTGCAAGTGTTTGGGTGAAAAACCCGAGCGCGTAATGAAAGTG-AAAGTTGAGATCCCTGTCGTAGGGAACATTGACGCCCGGATCTGACCTTTTGTGACGATTCTGCGGTAGAGCATGT--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------AGCCCGGAAGTGTCAGTTGTGCGAGACATCAGGGAGAAGGAATTGAGGCTGTACACCGATGCTGGACGTGTTTGTCGGCCACTCTTCATCGTCGAGAACCAACAGCTGGCACTTCAGAAGAAGCACGTCAAATGGCTCAGTAACGGCCTCAACGATGATGGCGATGAGTACAAATGGGAACATCTGGTAAAGGGTGGCATCATCGAGTTACTGGATGCTGAGGAAGAGGAAACGGTGATGATATCTATGACCCCTGAAGATCTTGAAAATTCTCGCCTACAGAAAAGTGGTGTTGATCCTCATGCAAACGACGGCGAGTTTGATCCAGCAGCTCGATTGAAGGCTGGCACTCACGCACACACATGGACACATTGCGAAATTCATCCCAGCATGATTCTTGGTATTTGCGCCAGCATTATTCCTTTCCCTGATCAT---------------------------------------------------------------------------------------------------------------------------------------------------------AAACTTTTGAC-TTATAGTTAGGCTTCTTTCACATTCTCATCATCTCAT-GTAGTGGAGTGAGGACCGTTTCAACGAAATCATCAAGGAGACGTCAACCTTCATCAAGAAGGTTGGCTACAACCCCAAGGCCGTTGCATTTGTCCCTATTTCCGGCTGGCACGGTGACAACATGTTGGAGGAATCCGCTAAGTGAGCATTC--TCGCATCGTCATGGTCGCCCC-TCGCTCATGTTGTACTC-AGCATGCCTTGGTACAAGGGCTGGACCAAGGAGACCAAGGCTGGTGTCGTCAAGGGCAAGACCCTCCTTGATGCTATTGATGCCATTGAGCCCCCCGTTCGACCTTCCGACAAACCCCTCCGTCTCCCCCTCCAGGATGTCTACAAAATTGGTGGTATTGGAACTGTGCCTGTCGGTCGTGTTGAGACTGGTATCATCAAGGCCGGAATGGTCGTCACTTTCGCTCCCTCCAACGTCACCACTGAAGTCAAGTCCGTCGAAATGCATCACGAACAGCTCGAGCAGGGTAACCCTGGTGACAATGTCGGTTTCAACGTCAAGAACGTGTCAGTGAAGGATATTCGTCGTG-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

>Corrales\_457\_Laccaria\_PAN2\_PANAMA\_ITS\_\_\_

CCTGA-TGTGGCTGTTAGCTGGC-TTTTTGAAGCATGTGCTCGTCCCGTCATCTTT-ATCTCT--CCA-CCTGTGAACATTTTGTAGTC-TT-GAATACCTCTTGAGGCAA-CTCGGGTTAGGGTTAG-GATTGCCGTGC---TGT---ACAAGCAGGCTTTCTTATCATTTTC-AAGACTATGTTTT--TTTTAA-TATACA-CCAAAGCATGTTTAAAGAATGTCATC-AATAGGAAC---TTGTTTCCTA--T-AAAATTATACAACTTTCAGCAACGGATCTCTTGGCTCTCGCATCGATGAAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTCAGTGAATCATCGAATCTTTGAACGCACCTTGCGCTCCTTGGTATTCCGAGGAGCATGCCTGTTTGAGTGTCATTAAA-TTCTCAA-CCTTCCAGC--------T-TTTATTAGCTTGG--TTAGGCTTGGA-TGT-GGGGG--TTGTGGGCTTC-AT-----T---ATTGAGGTCAGCTCTCCTTAAATGCATTAGCAGAACTTTTGTGGACTGTCTA-TTGGTGTGAT-AATTATCTACGCCGTGGAT-GTGAAGCAG-ATTTAT---GAAGTT-CAGCTTCC-AACCGTCC---ATTGACATGGACAA-----TTTTGACNA-TTTGA-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

>Corrales\_571\_Laccaria\_PAN2\_PANAMA\_ITS\_28S\_\_

CCTGA-TGTGGCTGTTAGCTGGC-TTTTTGAAGCATGTGCTCGTCCCGTCATCTTT-ATCTCT--CCA-CCTGTGAACATTTTGTAGTC-TT-GAATACCTCTTGAGGCAA-CTCGGGTTAGGGTTAG-GATTGCCGTGC---TGT---ACAAGCAGGCTTTCTTATCATTTTC-AAGACTATGTTTT--TTTTAA-TATACA-CCAAAGCATGTTTAAAGAATGTCATC-AATAGGAAC---TTGTTTCCTA--T-AAAATTATACAACTTTCAGCAACGGATCTCTTGGCTCTCGCATCGATGAAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTCAGTGAATCATCGAATCTTTGAACGCACCTTGCGCTCCTTGGTATTCCGAGGAGCATGCCTGTTTGAGTGTCATTAAA-TTCTCAA-CCTTCNAGC--------T-TTTATTAGCTTGG--TTAGGCTTGGA-TGT-GG------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------T-CTTTGGCTGT-CCGAGTTGTAATCTAGAGAAGTATTATCCGCGCTGGACCGTGTACAAGTCTCCTGGAATGGGGCGTCATAGAGGGTGAGAATCCCGTCTTTGACACGGACTGCCAGGGCTTT-GTGATGTGCTCTCGAAGAGTCGAGTTGTTTGGGAATGCAGCTCAAAATGGGTGGTAAATTCCATCTAAAGCTAAATATTGGCGAGAGACCGATAGCGAACAAGTACCGTGAGGGAAAGATGAAAAGAACTTTGGAAAGAGAGTTAAACAGTACGTGAAATTGCTGAAAGGGAAACGCTTGAAGTCAGTCGCGTTGGCCAGGGATCAA-CCTTGC----TTTTTT---GCTTGGCTTACTTTCTGGTCGATGGG-TCAGCATCAATTTTGACTGGTGG-AAAAAGTTCAAGGGAATGTGGCAT-CTTCGGATGTGTTATAGCCTTTGTTCGCATACATTGGTTGGGATTGAGGAACTCAGCACGCCGCAAGGCCGGG---TTTTTAACCACGTACGTGCTTAGGATGCTGGCATAATGGCTTTAATCGACCCGTCTTGAAACACGGACCAAGGAGTCTAACATGCCTGCAAGTGTTTGGGTGAAAAACCCGAGCGCGTAATGAAAGTG-AAAGTTGAGATCCCTGTCGTAGGGAACATTGACGCCCGGATCTGACCTTTTGTGACGATTCTGCGGTAGAGCATGT-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

>Corrales\_397\_Laccaria\_PAN2\_PANAMA\_ITS\_\_\_

CCTGA-TGTGGCTGTTAGCTGGC-TTTTTGAAGCATGTGCTCGTCCCGTCATCTTT-ATCTCT--CCA-CCTGTGAACATTTTGTAGTC-TT-GAATACCTCTTGAGGCAA-CTCGGGTTAGGGTTAG-GATTGCCGTGC---TGT---ACAAGCAGGCTTTCTTATCATTTTC-AAGACTATGTTTT--TTTTAA-TATACA-CCAAAGCATGTTTAAAGAATGTCATC-AATAGGAAC---TTGTTTCCTA--T-AAAATTATACAACTTTCAGCAACGGATCTCTTGGCTCTCGCATCGATGAAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTCAGTGAATCATCGAATCTTTGAACGCACCTTGCGCTCCTTGGTATTCCGAGGAGCATGCCTGTTTGAGTGTCATTAAA-TTCTCAA-CCTTCCAGC--------T-TTTATTAGCTTGG--TTAGGCTTGGA-TGT-GGGGG--TTGTGGGCTTC-AT-----T---ATTGAGGTCAGCTCTCCTTAAATGCATTAGCAGAACTTTTGTGGACTGTCTA-TTGGTGTGAT-AATTATCTACGCCGTGGAT-GTGAAGCAG-ATTTAT---GAAGTT-CAGCTTCC-AACCGTCC---ATTGACATGGACAA-----TTTTGACAA-TTTGA-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

>Corrales\_262\_Laccaria\_PAN2\_PANAMA\_ITS\_\_\_

CCTGA-TGTGGCTGTTAGCTGGC-TTTTTGAAGCATGTGCTCGTCCCGTCATCTTT-ATCTCT--CCCACCTGTGAACATTTTGTAGTC-TT-GAATACCTCTKGAGGCAA-CTCGGGTTAGGGTTAG-GATTGCCGTGC---TGT---ACAASCAGGCTTTCTTATCATTTTC-AARACTATGTTTT--TTTTAA-TATACA-CCAAAGCATGTTTAAAGAATGTCATC-AATAGGAAC---TTGTTTCCTA--T-AAAATTATACAACTTTCAGCAACGGATCTCTTGGCTCTCGCATCGATGAAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTCAKTGAATCATCGAATCTTTGAACGCACCTTGCGCTCCTTGGTATTCCGAGGAGCATGCCTGTTTGAGTGTCATTAAA-TTCTCAA-CCTTCCAGC--------T-TTTATTAGCTTGG--TTAGGCTTGGA-TGT-GGGGG--TTGTGGGCTTC-AT-----T---ATTGAGGTCAGCTCTCCTTAAATGCATTAGCAGAACTTTTGTGGACTGTCTA-TTGGTGTGAT-AATTATCTACGCCGTGGAT-GTGAAGCAG-ATTTAT---GAAGTT-CAGCTTCC-AACCGTCC---ATTGACATGGACAA-----TTTTGACAA-TTTGA-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

>Ovrebo5293\_Laccaria\_PAN2\_PANAMA\_ITS\_\_\_

------------------------------------------------------------------------------------------TT------------GAGGCAA-CTCGGGTTAGGGTTAG-GATTGCCGTGC---TGT---ACAAGCAGGCTTTCTTATCATTTTC-AAGACTATGTTTT--TTTTAA-TATACA-CCAAAGCATGTTTAAAGAATGTCATC-AATAGGAAC---TTGTTTCCTA--T-AAAATTATACAACTTTCAGCAACGGATCTCTTGGCTCTCGCATCGATGAAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTCAGTGAATCATCGAATCTTTGAACGCACCTTGCGCTCCTTGGTATTCCGAGGAGCATGCCTGTTTGAGTGTCATTAAA-TTCTCAA-CCTTCCAGC--------T-TTTATTAGCTTGG--TTAGGCTTGGA-TGT-GGGGG--TTGTGGGCTTC-AT-----T---ATTGAGGTCAGCTCTCCTTAAATGCATTAGCAGAACTTTTGTGGACTGTCTA-TTGGTGTGAT-AATTATCTACGCCGTGGAT-GTGAAGCAG-ATTTAT---GAAGTT-CAGCTTCC-AACCGTCC---ATTGACATGGACAA-----TTTTGACAA-TTTGA-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

>Corrales\_268\_Laccaria\_PAN3\_PANAMA\_ITS\_28S\_6F\_EF1a

------------------------------------------------TCATTTTT-ATCTCT--CCA-CCTGTGCACATTTTGTAGTC-TT-GGATAACCCTCGAGGCAA-CTCGGATT----TTTG-GATCGCTGTGC---TGT---ACAAGTCGGCTTTCCTTTCATTTCC-AAGACTATGTTTT------TA-TACACA-CCAATGTATGTTTAAAGAATGTCATC-AATGGGAAC---TTGTTTCCTA--T-AAAATTATACAACTTTCAGCAACGGATCTCTTGGCTCTCGCATCGATGAAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTCAGTGAATCATCGAATCTTTGAACGCACCTTGCGCTCCTTGGTATTCCGAGGAGCATGCCTGTTTGAGTGTCATTAAA-TTCTCAA-CCTTCCAGC--------T-TTTATTAGCTTGG--TGAGGCTTGGA-TGT-GGGGG--TTGCAGGCTTC-AT-----C---AATGAGGTCAGCTCTCCTTAAATGCATTAGTGGAACTTTTGTTGACCATCTA-TTGGTGTGAT-AACTATCTACGCCGTGGAT-GTAAAGCAA-CTTTAT---GAAGTT-CAGCTTCT-AACCGTCC---ATTAGCTTGGACAC-----TTTTGACAA-TTTGAAAGCTCAAATTTAAAATCTGGCAGT-CTTTGGCTGT-CCGAGTTGTAATCTAGAGAAGTATTATCCGCGCTGGACCGTGTACAAGTCTCCTGGAATGGAGCGTCATAGAGGGTGAGAATCCCGTCTTTGACACGGACTGCCAGGGCTTT-GTGATGTGCTCTCAAAGAGTCGAGTTGTTTGGGAATGCAGCTCAAAATGGGTGGTAAATTCCATCTAAAGCTAAATATTGGCGAGAGACCGATAGTGAACAAGTACCGTGAGGGAAAGATGAAAAGAACTTTGGAAAGAGAGTTAAACAGTACGTGAAATTGCTGAAAGGGAAACGCTTGAAGTCAGTCGCGTTGGCCAGGGATCAA-CCTTGC----TTTTTT---GCTTGGCTTACTTTCTGGTCAATGGG-TCAGCATCAATTTTGACTGGTGG-AAAAAGCTCAAAGGAATGTGGCAT-CTTCGGATGTGTTATAGCCTTTGTTCACATACATTAGTTGGGATTGAGGAACTCAGCATGCCGCAAGGCCGGG---TTTTTAACCACGTACATGCTTAGGATGCTGGCATAATGGCTTTAATCGACCCGTCTTGAAACACGGACCAAGGAGTCTAACATGCCTGCGAGTGTTTGGGTGAAAAACCCGAGCGCGTAATGAAAGTG-AAAGTTGAGATCCCTGTCGTGGGGAGCATTGACGCCCGGATCTGACCTTTTGTGACGATTCTGCGGTTGAGCATGC------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------AATACAAGTGGGAACATTTGGTAAAGGGTGGCATCATTGAGTTACTGGATGCTGAGGAAGAGGAAACAGTGATGATATCCATGACCCCTGAAGATCTTGAAAATTCTCGCCTACAGCAAAGTGGCGTTGATCCTCACGCGAACGACGGCGAGTTTGATCCAGCAGCTCGATTGAAGGCTGGCACTCACGCACACACATGGACACATTGCGAAATTCATCCTAGCATGATTCTTGGCATTTGTGCCAGCATTATTCCTTTCCCTGATCAT-------------------------------------------------------------------------------------------------------------------------------AACAAGATGGACACCACTAAGGTAAGAAACATATCAG-TTATAGTTAAGCTTTTTGCGCATTCTCATCATCTCAT-GTAGTGGAGCGAGGACCGTTTCAACGAAATCATCAAGGAGACGTCAACCTTCATCAAGAAGGTTGGTTACAACCCTAAGGCCGTTGCCTTTGTCCCTATTTCCGGCTGGCACGGTGACAACATGTTGGAGGAGTCCGCTAAGTAAGCATTC--TCGTATTGTCATGACCGCCCCGTCGCTCATGTTGCACTC-AGCATGCCTTGGTACAAGGGCTGGACCAAGGAGACAAAGGCTGGTGTTGTCAAGGGCAAGACCCTCCTTGATGCTATTGATGCCATTGAGCCACCTGTCCGACCTTCCGACAAACCCCTCCGTCTCCCCCTCCAGGATGTCTACAAAATTGGCGGTATCGGAACTGTGCCCGTCGGTCGTGTTGAGACTGGTATCATCAAGGCCGGAATGGTTGTCACTTTCGCTCCCTCCAACGTTACAACTGAAGTCAAGTCCGTCGAAATGCATCACGAACAGCTCGAGCAGGGCAACCCTGGTGACAATGTCGGTTTCAACGTCAAG---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

>Corrales\_25\_Laccaria\_PAN4\_PANAMA\_ITS\_\_\_

-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------CAAAGTATGTTTAAAGAATGTAATCTAATAGGAAC---TTGTTTGCC-TAT-AAAATTATACAACTTTCAGCAATGGATCTCTTGGCTCTCGCATCGATGAAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTCAGTGAATCATCGAATCTTTGAACGCACCTTGCGCTCCTTGGTATTCCGAGGAGCATGCCTGTTTGAGTGTCATTAAA-TTATCAACCTTTCCAGC--------T-TCTGTT-----GG--TTAGGCTTGGA-TGT-GGGGG--TTGCAGGCTTC-AT-----T---AATGAGGTCAGCTCTCCTTAAATGTATTAGCAGAACTTTTGTGGACTGTCTA-TTGGTGTGAT-AATTATCTATGCCGTGG---------CAG-CTTTAATATAAAGTT-CAGCTTCT-AACTGTCT---ATT-ACTG--AC--------TTTGACAA-TCTGA-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

>Corrales\_74\_Laccaria\_PAN4\_PANAMA\_ITS4B\_\_\_

----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------TCTCGCATCGATGAAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTCAGTGAATCATCGAATCTTTGAACGCACCTTGCGCTCCTTGGTATTCCGAGGAGCATGCCTGTTTGAGTGTCATTAAA-TTATCAACCTTTCCAGC--------T-TCTGTT-----GG--TTAGGCTTGGA-TGT-GGGGG--TTGCAGGCTTC-AT-----T---AATGAGGTCAGCTCTCCTTAAATGTATTAGCAGAACTTTTGTGGACTGTCTA-TTGGTGTGAT-AATTATCTATCCCGTGG---------CAG-CTTTAATATAAAGTT-CAGCTTCT-AACTGTCT---ATT-ACTG--AC--------TTTGACAA-TCTGA-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

>Corrales\_75\_Laccaria\_PAN4\_PANAMA\_ITS4B\_\_\_

----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------ACTTTCAGCAATGGATCTCTTGGCTCTCGCATCGATGAAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTCAGTGAATCATCGAATCTTTGAACGCACCTTGCGCTCCTTGGTATTCCGAGGAGCATGCCTGTTTGAGTGTCATTAAA-TTATCAACCTTTCCAGC--------T-TCTGTT-----GG--TTAGGCTTGGA-TGT-GGGGG--TTGCAGGCTTC-AT-----T---AATGAGGTCAGCTCTCCTTAAATGTATTAGCAGAACTTTTGTGGACTGTCTA-TTGGTGTGAT-AATTATCTATCCCGTGG---------CAG-CTTTAATATAAAGTT-CCGCTTCT-AACTGTCT---ATT-ACTG--AC--------TTTGACAA-TCTGA-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

>Corrales\_274\_Laccaria\_roseoalbescens2\_PANAMA\_ITS\_LROR\_\_EF1a

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