**Supplementary Table 3.** Isolates of Basidiomycete and Ascomycete species used for terpene cyclase (TC) prediction in Dykaria. All isolate genomes are available at the JGI MycoCosm data portal. 1KFG: 1000 Fungal Genomes Program.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **JGI Identifier** | **Phylum** | **Subphylum** | **Class** | **Order** | **Family** | **Species** | **Reference** |
| Aplpr1 | Ascomycota | Pezizomycotina | Dothideomycetes | Botryosphaeriales | Botryosphaeriaceae | *Aplosporella prunicola CBS 121.167 v1.0* | Haridas et al. (2020) |
| Bauco1 | Ascomycota | Pezizomycotina | Dothideomycetes | Capnodiales | Teratosphaeriaceae | *Baudoinia compniacensis UAMH 10762 (4089826) v1.0* | Ohm et al. (2012) |
| Aurpu\_var\_mel1 | Ascomycota | Pezizomycotina | Dothideomycetes | Dothideales | Dothioraceae | *Aureobasidium pullulans var. melanogenum CBS 110374* | Gostincar et al. (2014) |
| Hyspu1\_1 | Ascomycota | Pezizomycotina | Dothideomycetes | Hysteriales | Hysteriaceae | *Hysterium pulicare* | Ohm et al. (2012) |
| Micmi1 | Ascomycota | Pezizomycotina | Dothideomycetes | Microthyriales | Microthyriaceae | *Microthyrium microscopicum CBS 115976 v1.0* | Haridas et al. (2020) |
| Elsamp1 | Ascomycota | Pezizomycotina | Dothideomycetes | Myriangiales | Elsinoaceae | *Elsinoe ampelina CECT 20119 v1.0* | Haridas et al. (2020) |
| Lopmy1 | Ascomycota | Pezizomycotina | Dothideomycetes | Mytilinidiales | Mytilinidiaceae | *Lophium mytilinum CBS 269.34 v1.0* | Haridas et al. (2020) |
| Aaoar1 | Ascomycota | Pezizomycotina | Dothideomycetes | Pleosporales | Dacampiaceae | *Aaosphaeria arxii CBS 175.79 v1.0* | Haridas et al. (2020) |
| Tryvi1 | Ascomycota | Pezizomycotina | Dothideomycetes | Trypetheliales | Trypetheliaceae | *Trypethelium eluteriae v1.0* | Haridas et al. (2020) |
| Claca1 | Ascomycota | Pezizomycotina | Eurotiomycetes | Chaetothyriales | Herpotrichiellaceae | *Cladophialophora carrionii CBS 160.54* | Teixeira et al. (2017) |
| Aspacu1 | Ascomycota | Pezizomycotina | Eurotiomycetes | Eurotiales | Aspergillaceae | *Aspergillus aculeatinus CBS 121060 v1.0* | Vesth et al. (2018) |
| Artbe1 | Ascomycota | Pezizomycotina | Eurotiomycetes | Onygenales | Arthrodermataceae | *Arthroderma benhamiae CBS 112371* | Burmester et al. (2011) |
| EndpusZ1 | Ascomycota | Pezizomycotina | Eurotiomycetes | Verrucariales | Verrucariaceae | *Endocarpon pusillum Z07020* | Wang et al. (2014) |
| Pseel1 | Ascomycota | Pezizomycotina | Incertae\_sedis | Triblidiales | Triblidiaceae | *Pseudographis elatina* | **Unpublished (1KGF)** |
| Clagr3 | Ascomycota | Pezizomycotina | Lecanoromycetes | Lecanorales | Cladoniaceae | *Cladonia grayi Cgr/DA2myc/ss v2.0* | Armaleo et al. (2019) |
| Lobpul1 | Ascomycota | Pezizomycotina | Lecanoromycetes | Peltigerales | Lobariaceae | *Lobaria pulmonaria Scotland reference genome v1.0* | unpublished (Olafur S. Andrésson) |
| Xanpa2 | Ascomycota | Pezizomycotina | Lecanoromycetes | Teloschistales | Teloschistaceae | *Xanthoria parietina 46-1-SA22 v1.1* | **Unpublished (Paul Dyer)** |
| Acema1 | Ascomycota | Pezizomycotina | Leotiomycetes | Helotiales | Vibrisseaceae | *Acephala macrosclerotiorum EW76-UTF0540 v1.0* | **Unpublished (1KGF)** |
| Amore1 | Ascomycota | Pezizomycotina | Leotiomycetes | Incertae\_sedis | Myxotrichaceae | *Amorphotheca resinae v1.0* | Martino et al. (2018) |
| Cocst1 | Ascomycota | Pezizomycotina | Leotiomycetes | Rhytismatales | Rhytismataceae | *Coccomyces strobi CBS 202.91 v1.0* | **Unpublished (1KGF)** |
| Artol1 | Ascomycota | Pezizomycotina | Orbiliomycetes | Orbiliales | Orbiliaceae | *Arthrobotrys oligospora ATCC 24927* | Yang et al. (2011) |
| Aciaci1 | Ascomycota | Pezizomycotina | Pezizomycetes | Pezizales | Amplistromataceae | *Acidothrix acidophila CBS 136259 v1.0* | **Unpublished (1KGF)** |
| Calpu1 | Ascomycota | Pezizomycotina | Sordariomycetes | Calosphaeriales | Calosphaeriaceae | *Calosphaeria pulchella* | **Unpublished (1KGF)** |
| ThoPMI491\_1 | Ascomycota | Pezizomycotina | Sordariomycetes | Chaetosphaeriales | Chaetosphaeriaceae | *Thozetella sp. PMI\_491 v2.0* | **Unpublished (1KGF)** |
| ConPMI546 | Ascomycota | Pezizomycotina | Sordariomycetes | Coniochaetales | Coniochaetaceae | *Coniochaeta sp. PMI\_546 v1.0* | **Unpublished (1KGF)** |
| Crypa2 | Ascomycota | Pezizomycotina | Sordariomycetes | Diaporthales | Cryphonectriaceae | *Cryphonectria parasitica EP155 v2.0* | Crouch et al. (2020) |
| Acrchr1 | Ascomycota | Pezizomycotina | Sordariomycetes | Glomerellales | Plectosphaerellaceae | *Acremonium chrysogenum ATCC 11550* | Terfehr et al. (2014) |
| Beaba1 | Ascomycota | Pezizomycotina | Sordariomycetes | Hypocreales | Cordycipitaceae | *Beauveria bassiana ARSEF 2860* | Xiao et al. (2012) |
| Gaegr1 | Ascomycota | Pezizomycotina | Sordariomycetes | Magnaporthales | Magnaporthaceae | *Gaeumannomyces graminis var. tritici R3-111a-1* | Okagaki et al. (2015) |
| Melti1 | Ascomycota | Pezizomycotina | Sordariomycetes | Melanosporales | Melanosporaceae | *Melanospora tiffanyae F1KG0001 v1.0* | **Unpublished (1KGF)** |
| Corma2 | Ascomycota | Pezizomycotina | Sordariomycetes | Microascales | Halosphaeriaceae | *Corollospora maritima CBS 119819 v2.0* | **Unpublished (1KGF)** |
| Grocl1 | Ascomycota | Pezizomycotina | Sordariomycetes | Ophiostomatales | Ophiostomataceae | *Grosmannia clavigera kw1407* | DiGuistini et al. (2011) |
| Achstr1 | Ascomycota | Pezizomycotina | Sordariomycetes | Sordariales | Chaetomiaceae | *Achaetomium strumarium CBS333.67 v1.0* | **Unpublished (Pierre Gladieux, Francis Martin)** |
| Khuory1 | Ascomycota | Pezizomycotina | Sordariomycetes | Trichosphaeriales | Trichosphaeriaceae | *Khuskia oryzae ATCC 28132 v1.0* | **Unpublished (1KGF)** |
| Antav1 | Ascomycota | Pezizomycotina | Sordariomycetes | Xylariales | Diatrypaceae | *Anthostoma avocetta NRRL 3190 v1.0* | **Unpublished (1KGF)** |
| Trigu1 | Ascomycota | Pezizomycotina | Xylonomycetes | Xylonales | Xylonaceae | *Trinosporium guianense CBS132537 v1.0* | **Unpublished (1KGF)** |
| Neoirr1 | Ascomycota | Taphrinomycotina | Neolectomycetes | Neolectales | Neolectaceae | *Neolecta irregularis DAH-1 v1.0* | Nguyen et al. (2017) |
| Agabi\_varbisH97\_2 | Basidiomycota | Agaricomycotina | Agaricomycetes | Agaricales | Agaricaceae | *Agaricus bisporus var bisporus (H97) v2.0* | Morin et al. (2012) |
| Fibsp1 | Basidiomycota | Agaricomycotina | Agaricomycetes | Atheliales | Atheliaceae | *Fibulorhizoctonia sp. CBS 109695 v1.0* | Nagy et al. (2016) |
| Aurde3\_1 | Basidiomycota | Agaricomycotina | Agaricomycetes | Auriculariales | Auriculariaceae | *Auricularia subglabra v2.0* | Floudas et al. (2012) |
| Boled1 | Basidiomycota | Agaricomycotina | Agaricomycetes | Boletales | Boletaceae | *Boletus edulis v1.0* | **Unpublished (Francis Martin)** |
| Botbo1 | Basidiomycota | Agaricomycotina | Agaricomycetes | Cantharellales | Botryobasidiaceae | *Botryobasidium botryosum v1.0* | Riley et al. (2014) |
| Punst1 | Basidiomycota | Agaricomycotina | Agaricomycetes | Corticiales | Punctulariaceae | *Punctularia strigosozonata v1.0* | Floudas et al. (2012) |
| Sphst1 | Basidiomycota | Agaricomycotina | Agaricomycetes | Geastrales | Sphaerobolaceae | *Sphaerobolus stellatus v1.0* | Kohler et al. (2015) |
| Glotr1\_1 | Basidiomycota | Agaricomycotina | Agaricomycetes | Gloeophyllales | Gloeophyllaceae | *Gloeophyllum trabeum v1.0* | Floudas et al. (2012) |
| Gaumor1\_1 | Basidiomycota | Agaricomycotina | Agaricomycetes | Gomphales | Gautieriaceae | *Gautieria morchelliformis GMNE.BST v1.0* | **Unpublished (1KGF)** |
| Fomme1 | Basidiomycota | Agaricomycotina | Agaricomycetes | Hymenochaetales | Hymenochaetaceae | *Fomitiporia mediterranea v1.0* | Floudas et al. (2012) |
| Jaaar1 | Basidiomycota | Agaricomycotina | Agaricomycetes | Jaapiales | Jaapiaceae | *Jaapia argillacea v1.0* | Riley et al. (2014) |
| Mutel1 | Basidiomycota | Agaricomycotina | Agaricomycetes | Phallales | Phallaceae | *Mutinus elegans ME.BST v1.0* | **Unpublished (1KGF)** |
| Abobie1 | Basidiomycota | Agaricomycotina | Agaricomycetes | Polyporales | Meruliaceae | *Abortiporus biennis CIRM-BRFM1778 v1.0* | **Unpublished (Marie-Noëlle Rosso)** |
| Amycha1 | Basidiomycota | Agaricomycotina | Agaricomycetes | Russulales | Amylostereaceae | *Amylostereum chailletii DWAch2 v1.0* | **Unpublished (Francis Martin)** |
| Pirin1 | Basidiomycota | Agaricomycotina | Agaricomycetes | Sebacinales | Sebacinaceae | *Piriformospora indica DSM 11827 from MPI* | Zuccaro et al. (2011) |
| Thega1 | Basidiomycota | Agaricomycotina | Agaricomycetes | Thelephorales | Thelephoraceae | *Thelephora ganbajun P2 v1.0* | **Unpublished (1KGF)** |
| Sisni1 | Basidiomycota | Agaricomycotina | Agaricomycetes | Trechisporales | Trechisporaceae | *Sistotremastrum niveocremeum HHB9708 ss-1 1.0* | Nagy et al. (2016) |
| Calco1 | Basidiomycota | Agaricomycotina | Dacrymycetes | Dacrymycetales | Dacrymycetaceae | *Calocera cornea v1.0* | Nagy et al. (2016) |
| Walse1 | Basidiomycota | Agaricomycotina | Wallemiomycetes | Wallemiales | Wallemiaceae | *Wallemia mellicola v1.0* | Padamsee et al. (2012) |
| Atrsp2 | Basidiomycota | Pucciniomycotina | Atractiellomycetes | Atractiellales | Incertae\_sedis | *Atractiellales rhizophila v2.0* | **Unpublished (Francis Martin, Greg Bonito)** |
| Croqu1 | Basidiomycota | Pucciniomycotina | Pucciniomycetes | Pucciniales | Cronartiaceae | *Cronartium quercuum f. sp. fusiforme G11 v1.0* | Pendleton et al. (2014) |