Mollisia

Friday, 22 March 2019 9:46

These notes were Initially prepared in late 2017, additional species have subsequently been collected in NZ, but this summary gives an idea of the diversity present in NZs native forests, and its relationship to that found in the rest of the world.

Data is presented as an ITS gene tree, comparing the 50 or so New Zealand *Mollisia* and *Mollisia*-like species for which there are cultures, to specimens treated by Joey Tanney (2016; *Phialocephala*), Brian Douglas (2013, PhD thesis), and Genbank BLAST matches to accessions from type specimens (*Ascocoryne*, *Helicodendron* and *Dimorphospora* (*Gelatinodiscaceae*) as outgroups). UNITE Species Hypothesis matches are noted. Morphology has barely been compared, but in the case of NZ Species 31 morphology does not support the ITS-based genetic match. Any matches need confirming with a more discriminatory gene; RPB1 has been used by Tanney and others. Generic limits remain poorly resolved.

Data in Geneious Dan Discos\28 Sept 2017\Mollisia

'Mollisia' in the sense discussed here includes most of the New Zealand specimens having a sexual fruiting body with a *Dermateaceae* morphology in the sense of Korf (non-gelatinous excipulum of more or less globose cells, usually with dark walls) that have an ITS sequence available, in morphologically defined genera such as *Mollisia, Pyrenopeziza, Niptera*, and *Tapesia*. Also included are the (as yet unpublished) sequences from the *Mollisia* PhD thesis of Brian Douglas, the *Phialocephala* sequences from Joey Tanney (2016), and sequences that represent type specimens from Genbank BLAST search results based on the New Zealand sequences.

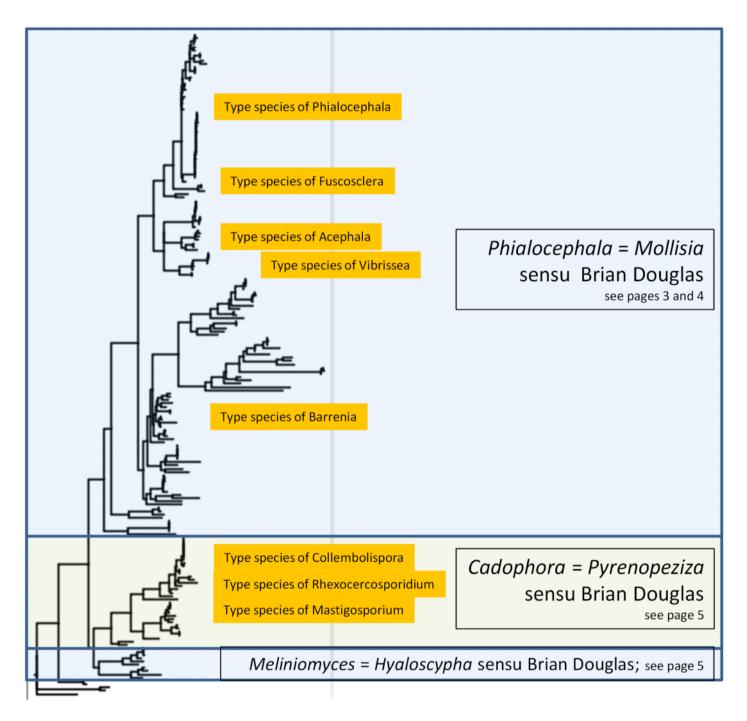
Included in the phylogeny on the basis of genetic similarity are a range of *Leotiomycetes* with reduced ascomata (e.g. *Loramyces*), several genera based on asexual morphologies (e.g. *Barrenia, Acephala, Fuscosclera* and *Phialocephala*, in addition to the genus *Vibrissea*. Genetically robust generic limits amongst these fungi remain to be resolved.

Some specimens with a more or less *Mollisia*-like morphology are genetically distinct. For example, D1091, D818, D770, in UNITE Species Hypothesis SH021623.07FU and genetically close to fungi with an aquatic hyphomycete like morphology such as *Helicodendron*, *Filosporella*, *Tricladium*, etc.

Tanney et al. 2016. Sexual and asexual states of some endophytic Phialocephala species of Picea. Mycologia 108: 255–280. DOI: 10.3852/15-136.

Douglas B 2013. The taxonomy, phylogenetics and ecology of fungal plant-endosymbionts assignable to the genera Mollisia, Pyrenopeziza and Hyaloscypha (Helotiales, Leotiomycetes, Ascomycota). PhD Thesis, Aberystwyth University.

ITS gene tree incoporating data from Brian Douglas (2013), Joey Tanney (2016), types from GenBank, and cultures from mollisioid apothecia from New Zealand



Note: there is no sequence data for the type specimens of *Mollisia*, *Pyrenopeziza*, *Cadophora* Outgroup, genera of *Gelatinodiscaceae* – *Ascocoryne*, *Helicodendron*, *Dimorphospora*

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AY249075.1_Phialocephala_dimorphospora_strain_P59_
Tanney_Phialocephala_dimorphospora_GQ241290.1
Genbank_NR_135931.1_Phialocephala_dimorphospora_CBS_300.62_ITS_region_FTE
Tanney_Phialocephala_dimorphospora_DAOMC250111
Tanney_Phialocephala_repens_MUCL1849
Tanney_Mollisia_heterosperma_CBS292.59
Genbank_NR_136124.1_Phialocephala_aylmerensis_DAOM_C_250106_ITS_region_TYPE
Tanney_Phialocephala_aylmerensis_DAOMC250106_TYPE
Genbank_AF083198.1_Phialocephala_botulispora_
Genbank_NR_119426.1_Phialocephala_lagerbergii_CBS_266.33_ITS_region_TYPE
D728_Dimorphospora
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Type species of Phialocephala
Tanney Phialocephala aylmerensis DAOMC250106_TYPE
Genbank AF083198.1 Phialocephala botulispora
Genbank NR_119426.1 Phialocephala_lagerbergii_CBS_266.33_ITS_region_TYPE
D738_Dimoprhospora
D1876_Mollisia_saturated_wood NZ species 1; no excat Genbank match
D655_Torrendella_madsenii_number_mixup
Genbank, NR_136123.1 Phialocephala_mallochii_DAOM_C_250113_ITS_region_TYPE
Tanney_Phialocephala_dimorphospora_AY606304.1
TTT1406_Mollisia_sp_6_wood NZ species 2; no exact Genbank match
D638_Mollisia_noth_wood
D703_Mollisia_cnoth_wood
D703_Mollisia_cnoth_wood
D703_Mollisia_cnoth_wood
D703_Mollisia_cnoth_wood
D703_Mollisia_cnoth_wood
D703_Mollisia_cnoth_wood
Genbank, NR_1361221. Phialocephala_catenospora_DAOM_C_250108_ITS_region_TYPE
Genbank, NR_1361221. Phialocephala_catenospora_DAOM_C_250115_ITS_region_TYPE
TTT2238_Phialocephala_dimorphospora_AY606303.1
Genbank, NR_136121.1_Phialocephala_nodosa_DAOM_C_250115_ITS_region_TYPE
TTT2238_Phialocephala_dr_dimorphospora_NZ_species 2s; ITS Phialocephala_nodosa_sensu Tanney
Douglas_Mollisia_cr_c_cinerea_benesuada_SW_2
903_Mollisia_cr_c_cinerea_benesuada_SW_2
903_Mollisia_cn_cr_cinerea_benesuada_SW_7
D1957_Mollisia_decort_wood
Tanney_Phialocephala_oblongum_DAOMC250118
D636_Mollisia_unth_wood
D1657_Mollisia_decort_wood
Tanney_Phialocephala_of_dimorphospora
D689_Mollisia_wet_wood
D1117_Mollisia_wood
D651_Mollisia_wood
D651_Mollisia_wood
D652_Mollisia_wet_wood
D1117_Mollisia_wood
NZ_species 3; ITS Phialocephala oblongasensu Tanney
but morphology does not seem to match
D726_Phialocephala_oblongum_DAOMC250118
D652_Mollisia_wood
NZ_species 5; no Genbank match
D727_Phialocephala_oblongum_DAOMC250118
D652_Mollisia_wood
NZ_species 5; no Genbank match
D728_Hollisia_wood
NZ_species 5; no Genbank match
D729_Mollisia_wood
NZ_species 5; no Genbank match
D7201_Hollisia_wood
NZ_species 6; no Genbank match
D721_Phialocephala_wood
NZ_species 6; no Genbank match
D721_Phialocephala_wood
NZ_species 8; no Genbank match
D721_Phialocephala_wood
NZ_species 8; no Genbank match
D721_Phialocephala_wood
NZ_specie
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Type species of Fuscosclera
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        putative specimens of Type species of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mollisia, M. cinerea [no epitype yet]
                            D1428_Mollisia_cut_end_of_branch
TTT196_Mollisia_sp_7
D2193_Mollisia_wood
D1696_Mollisia_Metrosideros_wood
D1710_Mollisia_Olearia_wood
                                                                                                                                                                                                                                                                                                             NZ species 9: no Genbank match
     D1710_Mollisia_Olearia_wood
D684_Mollisia_cinerea
Genbank_NR_103577.1_Phialocephala_fortinii_CBS_443.86_ITS_region
Genbank_NR_103577.1_Phialocephala_fortinii_strain_P58
Genbank_AY249076.1_Phialocephala_fortinii_strain_P58
Genbank_NR_119482.1_Acephala_applanata_CBS_109321_ITS_region
Genbank_NR_119482.1_Acephala_applanata_CBS_109321_ITS_region_TYPE
Tanney_Phaeomollisia_piceae_DAOMC250102
Genbank_NR_121349.1_Acephala_macrosclerotiorum_CBS_123555_ITS_region_TYPE
AK1039_Dermateaceae_wood_in_water
AK1035_Dermateaceae_wood_in_water
AK1025_Dermateaceae_wood_in_water
AK1025_Dermateaceae_submerged_wood
AK1075_Leotiales_submerged_wood
D772_Vibrissea_wood_in_stream KF429257
Genbank_AY789427_Vibrissea_flavovirens_stripped_
99892_Vibrissea_sp_Vibrissea_sp__SAmerican V. truncorum
Vibrissea close to here
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D669_Mollisia_Fuchsia_wood
D367_Mollisia_cinerea NZ species 11; ITS very close to Douglas SW-19, ex wood ex Wales
D643_Mollisia_cinerea UNITE SH211419.07FU, ex wood ex Sweden
                         22027 4101
                                               Douglas Mollisia sp. SW 19
D873 Leotiales
                                                     Douglas Mollisia sp. SW_3
D762 Mollisia noth bark
D2135 Mollisia Fuchsia wood
cam38as2 Mollisia Bulbinella

NZ species 12; ITS very close to Douglas S
ex wood ex Wales; No match in Genbank
NZ species 13; no Genbank match
                                                                                                                                                        NZ species 12; ITS very close to Douglas SW-3,
         D2135 Mollisia Bulbinella NZ species 13; no Genbank match NZ species 14; UNITE SH22581.07FU ex Antarctica D839 Mollisia Juncus Douglas Mollisia sp. PEN 8 NZ species 15; UNITE SH212581.07FU ex N temperate D834 Mollisia grunning water NZ species 16; no Genbank match D924 Mollisia [solepus ]eaf NZ species 17; UNITE SH025385.07FU ex Huperzia [moss] leaves, China D839 Pyrenopeziza Juncus leaf NZ species 17; UNITE SH025385.07FU ex Huperzia [moss] leaves, China D839 Mollisia cf. Pyrenopeziza revincta BDC PEN 10 Douglas Mollisia cf. Pyrenopeziza revincta SW 11 NZ species 18; no Genbank match D815 Mollisia wood NZ species 18; no Genbank match D815 Mollisia decort wood NZ species 20; no Genbank match D030 Mollisia Criaria wood NZ species 21; UNITE SH203613.07FU, Scandanavia D658 Mollisia decort wood NZ species 22; no Genbank match D1737 Mollisia Chionochloa NZ species 22; no Genbank match D1732 Helotiales wood NZ species 22; no Genbank match D1732 Helotiales wood NZ species 26; close to UNITE SH203614.07FU D817 Calycellina nikau reversed NZ species 26; close to UNITE SH203614.07FU D0313 Mollisia cf. Pyrenopeziza arenivaga CRB D0313 Mollisia cf. Pyrenopeziza arenivaga CRB D033 Mollisia cf. Pyrenopeziza arenivaga CRB D033 Mollisia cf. Pyrenopeziza arenivaga CRB D033 Mollisia cf. purablis EX 10s D033 Mollisia cf. poaeoides PEN 7
        Douglas Mollisia sp. AB 1

Douglas Mollisia cf_poaeoides._PEN_7

Genbank_KT598375.1_Barrenia_taeda_isolate_CM14P64

Type species of Barrenia

D2011_Mollisia_decort_wood NZ species 29; UNITE SH438281.07FU 0.5% ex. China, Korea
     D2308_Mollisia_Nothofagus_wood
D1302_Mollisia_wood_in_water
Au09_33_Mollisia_Nothofagus_wood
Douglas_Mollisia_Nothofagus_wood
Douglas_Mollisia_ct_olivascens_=_Phialocephala_urceolata_SW_20
Genbank_NR_119465.1_Phialocephala_hiberna_BPI_842235_ITS_region_TYPE
                  TTT2390
            TTT2397_Mollisia
TTT2397_Mollisia NZ species 34; no Genbank match
TTT2395_Mollisia
Au09_50_Mollisia_rotten_wood
Not Mollisia morphology,
                                                                                                                                                                                                                         have gel tissues in apothecia
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