

Mycological Notes 37

New Zealand Lyophyllaceae and broadly related species

Jerry Cooper, 1st Jan. 2017

At the time of writing the phylogenetic boundaries of the Lyophyllaceae are yet to be firmly established. The genera and species within the family are rather nondescript with the appearance of other genera such as *Tricholoma*, *Clitocybe*, *Gymnopus/Collybia* or *Mycena*. As a consequence members of the family are difficult to recognise, although the larger species seem to be characteristically fasciculate and have a greasy texture to the cap when fresh. They are distinguished microscopically because the nuclei within the basidia bind to iron salts and can be stained. The staining results in dark purple 'siderophilous' granules within the basidia. Such basidia are called carminophilous, after the stain used. I've found these are best seen by boiling a piece of gill material on a glass slide in a generous drop of concentrated acetocarmine solution, and then quickly and vigorously prodding/stirring with a rusty nail, repeat heat/prodding, and then finally blotting the result and mounting in fresh acetocarmine or lactic acid. Note that standard acetocarmine solution, which is generally used for staining chromosomes, is not sufficiently concentrated. See Clemençon 2009 for more details and more sophisticated staining methods. Cotton blue in lactic acid has a similar staining effect, although I find the results less convincing. Genera and species within a broader concept of the family may not show the reaction.

Early phylogenetic data confirmed the family and identified different clades but the genus *Lyophyllum* was clearly polyphyletic. As a consequence several new genera were erected for species that were previously treated as *Tephroclybe/Lyophyllum*. The new genera in the Lyophyllaceae and related groups includes *Sagaranelia*, *Myochromella*, *Leucocybe*, *Atractosporocybe*, *Rhizocybe*, *Calocybella*, *Musumecia*, *Sphagnurus* and *Tephroclybella*. Some of these new genera seem to be based on limited sampling of northern hemisphere taxa. Increasing sequence data, especially from a broader geographical range, suggest many more genera will be required to accommodate this level of splitting. There is perhaps a danger that we are creating a situation similar to *Boletus sensu lato* and a proliferation of new genera without clear and consistent morphological definitions. It is currently unclear whether existing perceived boundaries between some of these new genera in the Lyophyllaceae will persist when sampling becomes less biased. Fewer and more inclusive generic concepts may provide a pragmatic alternative.

1	Frb in modified grassland/lawns and with some shade of pink or violet	Calocybe carnea
1'	Natural habitats and colours otherwise	2
2	Associated with fire sites	Lyophyllum atratum
2'	Not associated with fire sites	3
3	Stipe base with profuse thick rhizoids	4
3'	Stipe base without profuse rhizoids	6
4	Associated with rotting ferns	Calocybe JAC10304

4'	On soil, litter	Rhizocybe sp. 'Lake Taylor'
4''	On wood	5
5	Frb white/yellow, centrally to eccentrically stipitate, gills decurrent	Rhizocybe albida
5'	Frb laterally stipitate to pleurotoid, brown.	Rhizocybe sp. 'Pureora'
6	On wood	7
6'	In soil, litter	8
7	Mouse brown. Stipe much longer than cap diameter. Tephroclybe-like	Myochromella sp. 'Craigieburn'
7'	Frb white, on wood, centrally to eccentrically stipitate, gills sinuate and crowded	Ossicaulis sp. 'Prices valley'
8	Frb mycenoid, with moss	Lyophyllum sp. 'Rangitaiki'
8'	Frb tricholomatoid. Cap with with greasy texture	9
9	Frb pale grey. Spores elongate, Q=2	Gerhardtia pseudosaponacea
9'	Frb darker brown. Spores globose	10
10	Fresh frbs with white gills. Frb not blackening on drying	Lyophyllum decastes aff.
10'	Fresh frbs grey/brown gills. Frb blackening on drying	Lyophyllum moncalvoanum

Calocybe carnea

In recent years the generic names *Rugosomyces* (type *R. onychinus*, 1979) and *Calocybe* (type *C. gambosa*, 1962) have been applied to this species. The current phylogenetic data suggests that even if *Rugosomyces* and *Calocybe* are considered as separate genera the correct name for the white gilled species, including *C. carnea*, *C. ionides* and *C. persicolor*, is *Calocybe* and not *Rugosomyces*. In New Zealand *Calocybe carnea* is common in urban lawns, at least in South Island. The species is variable with thin delicate cream or brown forms looking like *Marasmius oreades* or *Gymnopus* through to robust purple/lilac forms. There are separate names for different colour forms, e.g. *C. ionides* and *C. persicolor*, but the data suggest the latter two, at least, are synonyms. The photos presented here are of fruitbodies from the same mycelium, collected at different times, and with identical sequences.

Calocybe JAC10304

This has been collected a couple of times in association with rotting ferns. The fruitbodies have the appearance of a *Calocybe* but it is not congeneric. It is similar to *Rhizocybe* in possessing rhizoids. It is within the broad *Lyophyllum* clade.

Gerhardtia pseudosaponacea

This species turned up as a surprise in sequence data when working on *Tricholoma*. It looks like a washed out form of *Tricholoma saponaceum*. The species (indeed the genus) is difficult to recognise, although most species have spores with an irregular outline.

Lyophyllum atratum

This species is always associated with old bonfire sites and burnt wood. New Zealand seems to have relatively few fire adapted fungi, and like *Pholiota highlandensis* found in similar sites, this species is probably introduced. This used to be called *Tephroclybe atrata*. Species formerly placed in the genus

Tephrocybe (now considered congeneric with *Lyophyllum*), have a certain recognisable look to them.

Lyophyllum decastes* & *Lyophyllum moncalvoanum

Lyophyllum decastes and *L. moncalvoanum* are relatively large species that grow in clusters in soil in the beech forest. The caps are dark brown with a characteristic greasy texture when fresh. They could be confused with indigenous species of *Tricholoma* and *Porpoloma*, although both are paler, even when fresh. Our version of *L. decastes* isn't quite the same as the northern hemisphere version, but not worth a different name. *L. moncalvoanum* is part of a group that turns black on handling, although the New Zealand species has a weak reaction and is most noticeable one the material has dried.

***Myochromella* sp. 'Craigieburn (PDD96415)'**

Myochromella is a recent segregate in the family for species with a *Tephrocybe*-like appearance with mouse-brown colouration and not growing in clusters. In NZ just a single collection of an undescribed species has been found so far.

***Ossicaulis* sp. 'Prices valley (PDD87161)'**

I'm 95% sure this is the species known in Australia as *Clitocybe semiocculta*, but examination of Cleland's type, and in particular the pileipellis hyphae would be needed to confirm that before making the appropriate combination *Ossicaulis semiocculta*. The sequence data clearly indicate this species belongs in *Ossicaulis*. Morphologically it is somewhat similar to *Rhizocybe albida* (distinguished by rhizoids), and *Pleurocollybia cremea* (see Mycological Notes number 2). Singer's South American *Clitocybe pleurotus* with ellipsoid spores may be related.

Sagaranelia tylicolor

I have not seen this species in New Zealand but it has been reported from plots treated with urea under the name *Tephrocybe tesquorum*. I think there is the possibility these records refer to *Lyophyllum* sp. 'Rangitaiki'.

***Lyophyllum* sp. 'Rangitaiki (PDD96287)'**

This is a mycenoid species occurring singly on mossy soil. From a phylogenetic perspective this represents a different genus to *Lyophyllum* or any of the recent segregates. Siderophilous granules are absent in material tested so far.

Rhizocybe albida

Rhizocybe was erected for *Clitocybe vermicularis* and related species. They are characterised by clitocyboid fruitbodies and coarse rhizoids at the stem base. Stevenson's *Omphalina albida* was moved into *Clitocybe* by Horak and possesses rhizoids. Geoff Ridley coined the common name 'bootlace funnel-cap' for this species which both phylogenetic and morphological data clearly support as a *Rhizocybe*. Siderophilous granules are absent.


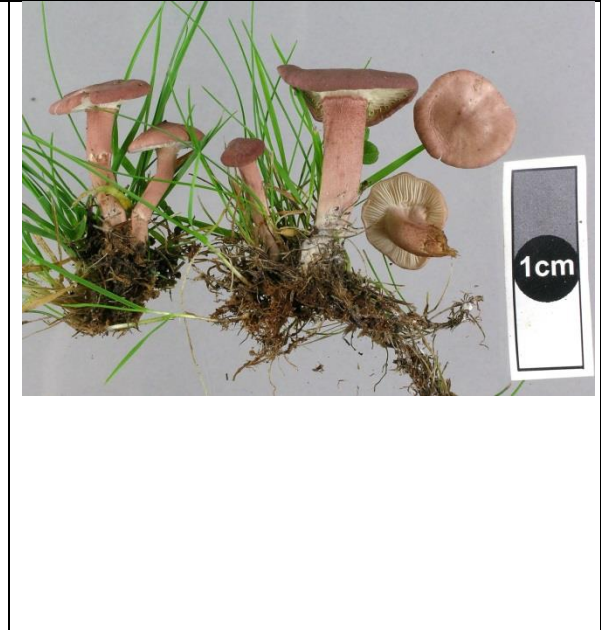


***Rhizocybe* sp. 'Lake Taylor (PDD 96758)'**

This species has been found just once in modified pasture and it may be an introduction. It more closely conforms to the European concept of *Rhizocybe* and *R. vermicularis*.

***Rhizocybe* sp. 'Pureora (PDD96261)'**

The fruitbodies are pleurotoid and the placement in *Rhizocybe* requires better support, but like *R. albida* it has strong basal rhizoids and growth on rotting wood.

It is the occurrence of species like this, and *Lyophyllum* sp. 'Rangitaiki' that bring into question the current morphological concepts and regionally restricted phylogenetic sampling associated with new genera within the Lyophyllaceae and related groups.

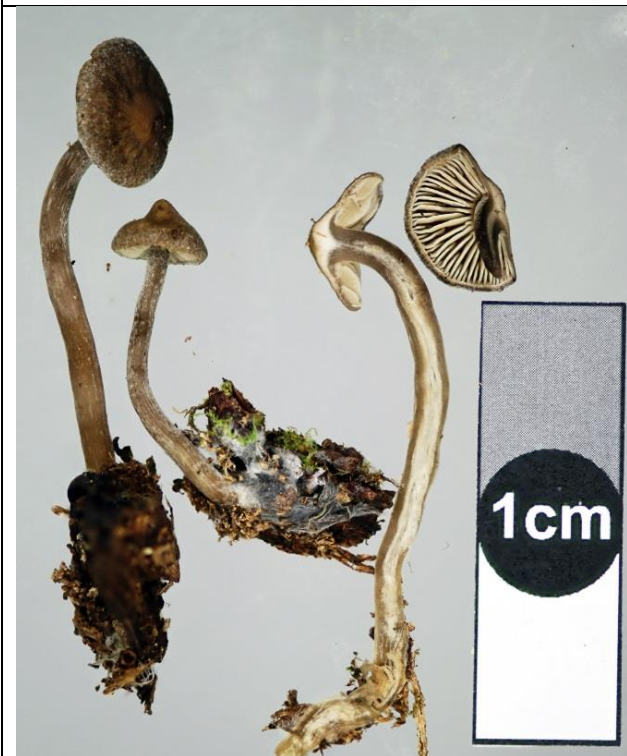
	
<p>Calocybe carnea PDD 95629=JAC11170</p>	<p>Calocybe carnea PDD 86973=JAC9864</p>
	
<p>Gerhardtia pseudosaponacea PDD96650=JAC12535</p>	<p>Lyophyllum atratum PDD 87010=JAC9901</p>



Lyophyllum decastes aff. PDD 106071=JAC13867



Lyophyllum moncalvoanum PDD 96328=JAC12088



Myochromella sp. 'Craigieburn' PDD 96415=JAC11326



Ossicaulis sp. 'Prices valley' PDD 96001=JAC11713



Lyphallum sp. 'Rangitaiki' PDD 106264=JAC14096



FUNNZ2011/161

Lyophyllum sp. 'Rangitaiki' PDD 96287=JAC12044



FUNNZ: 2007/0493

Calocybe JAC10304



A38

Rhizocybe albida PDD 106023=JAC 13818



Rhizocybe sp. 'Lake Taylor' PDD 96758=JAC12629



FUNNZ2011/1228

Rhizocybe sp. 'Pureora' PDD 96261=JAC 12008

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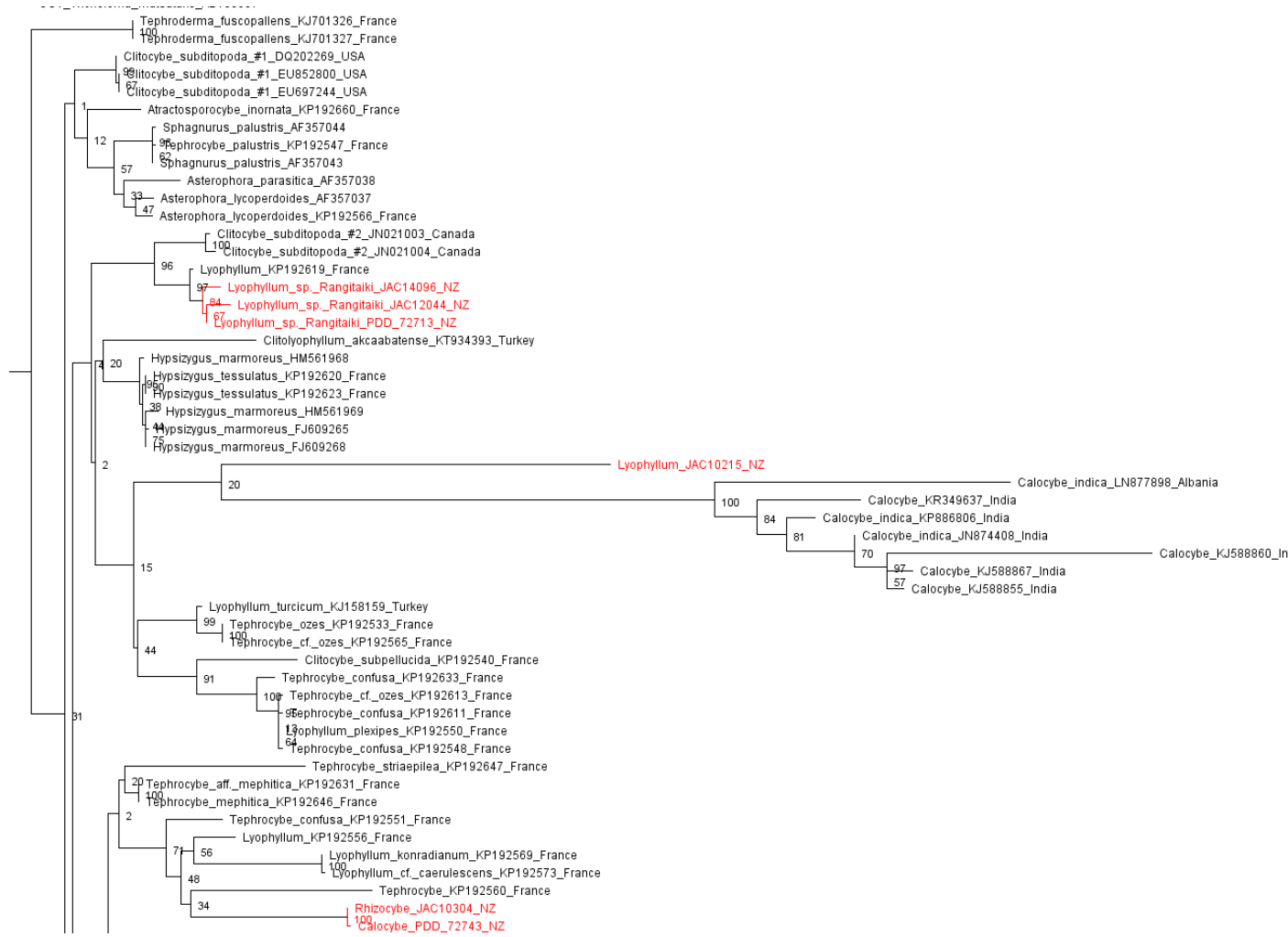
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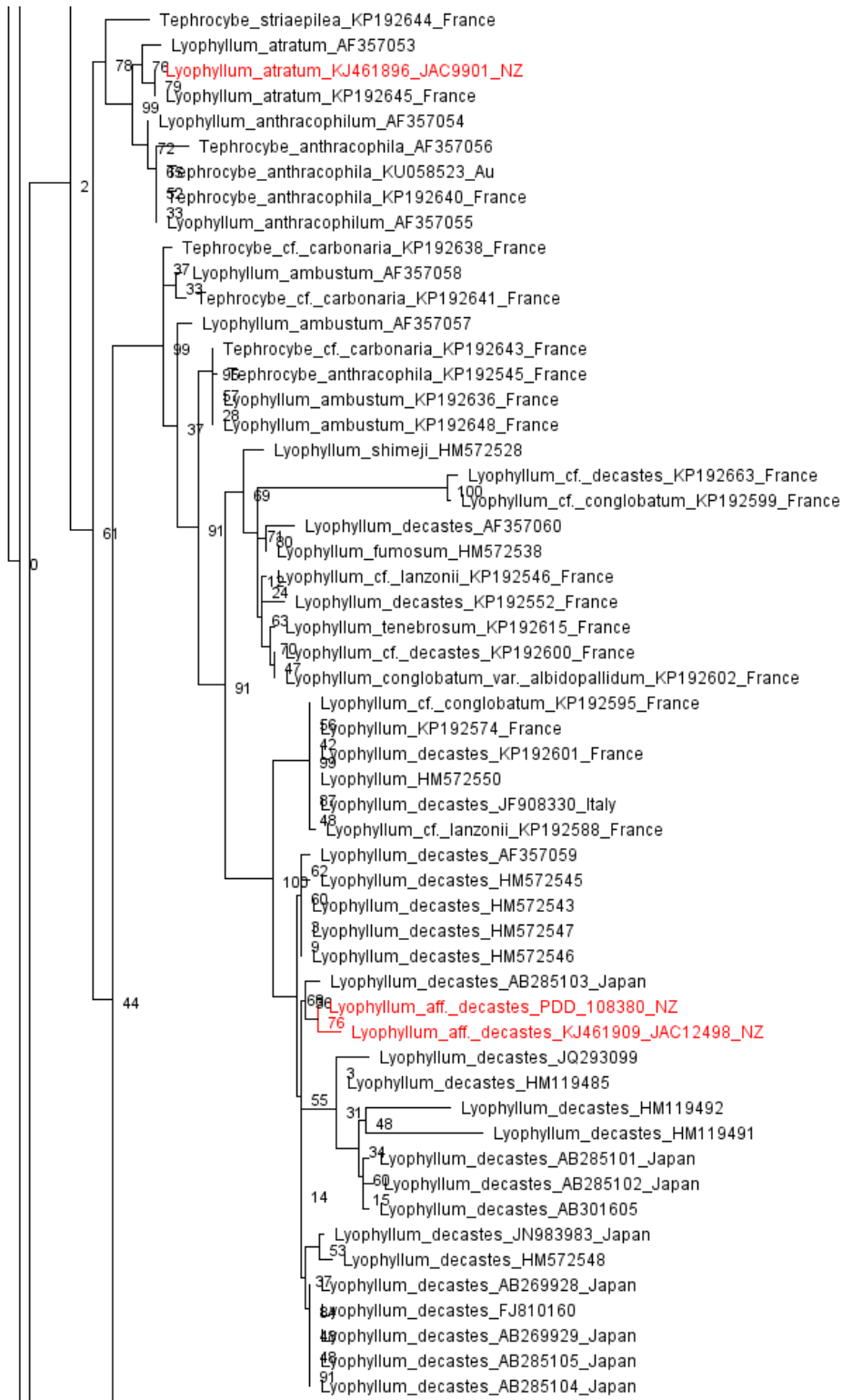
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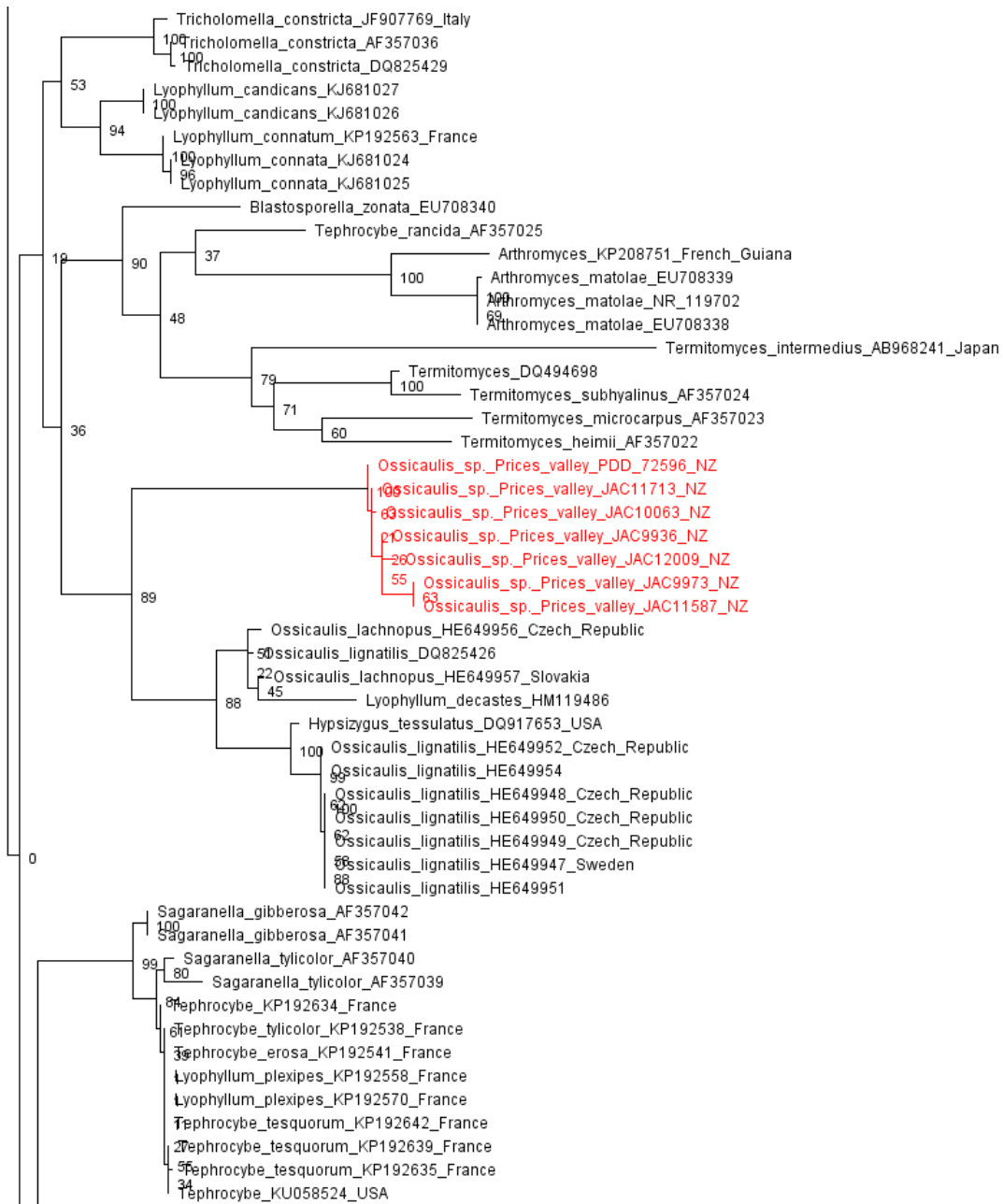
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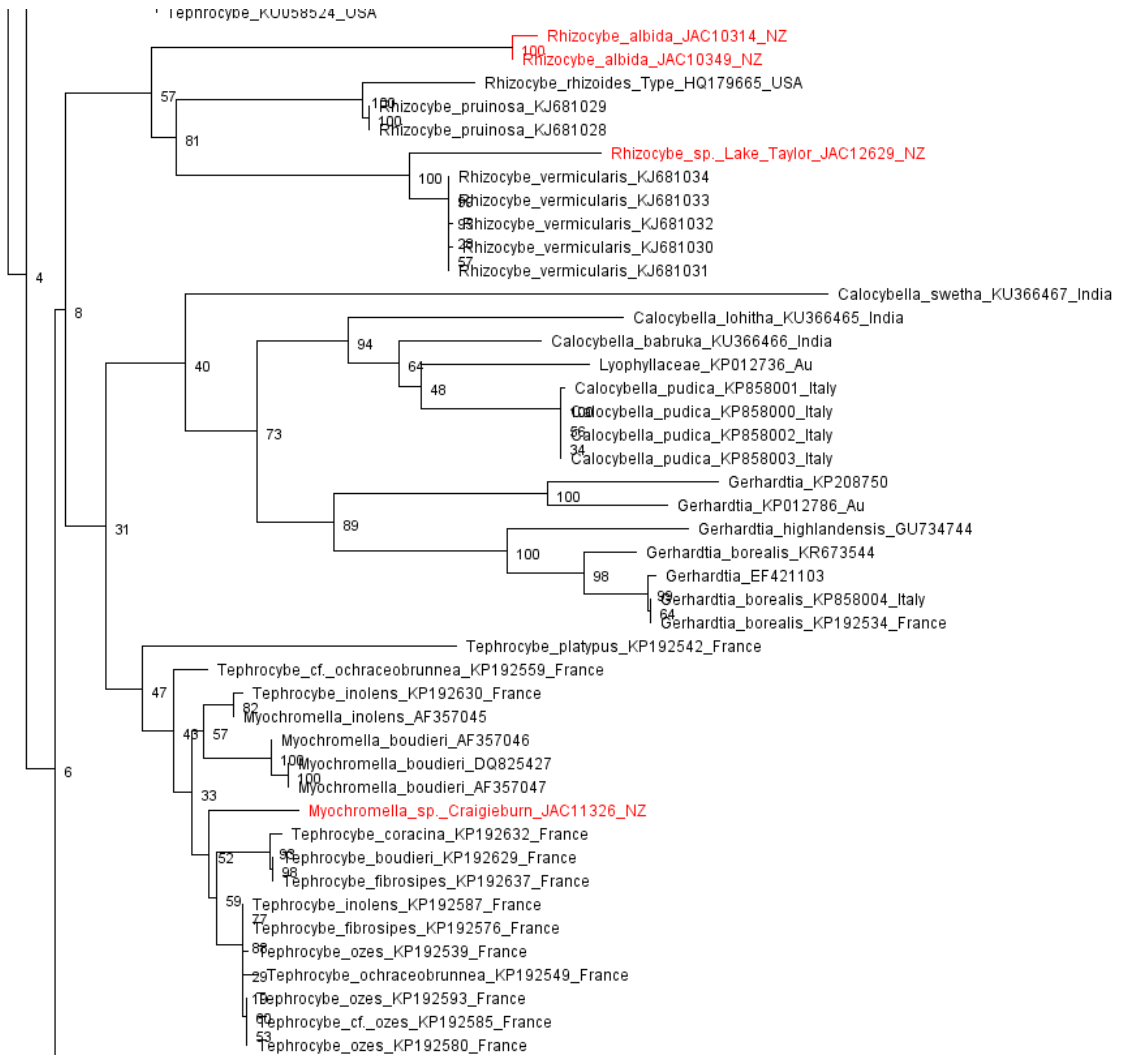
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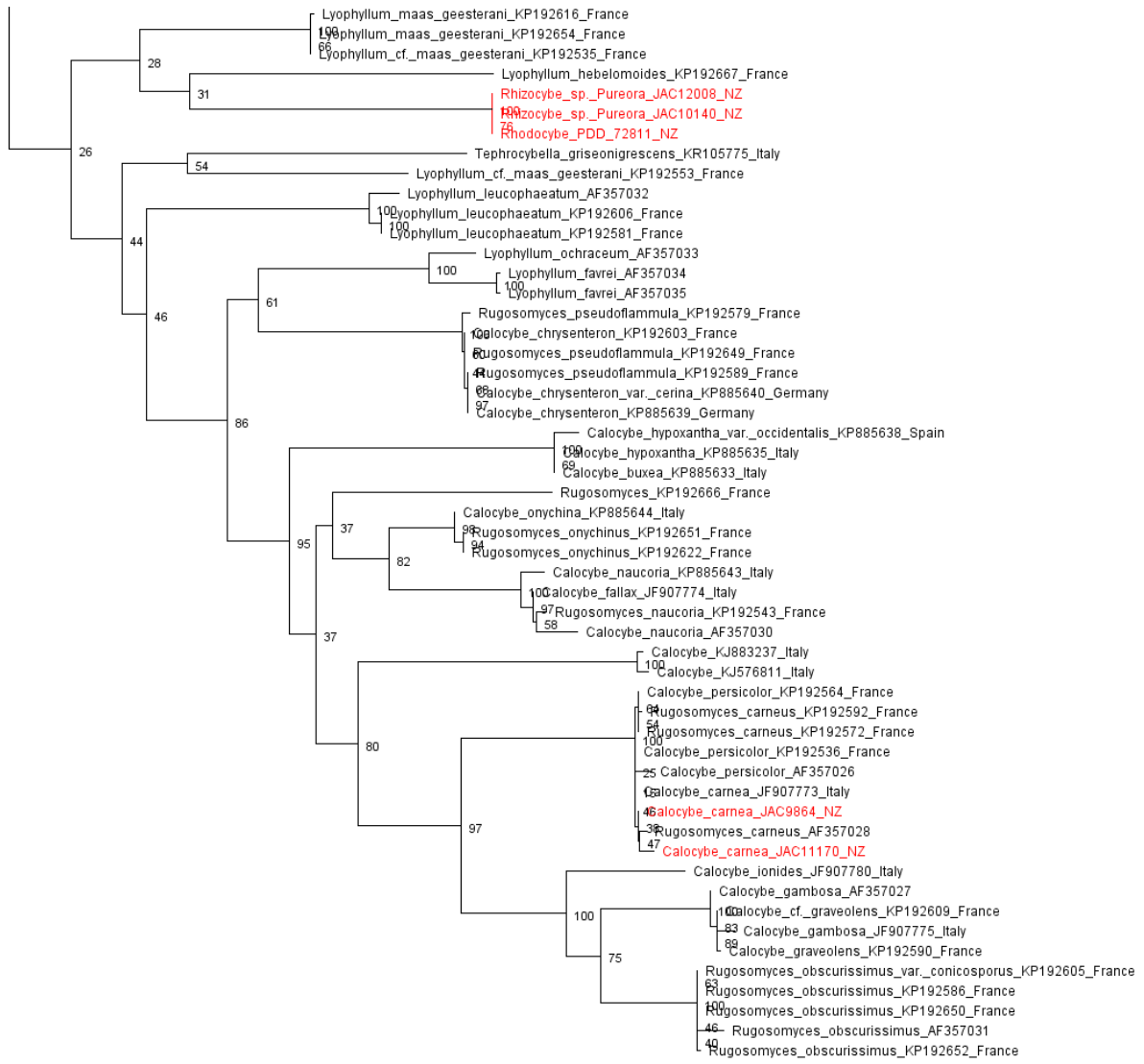
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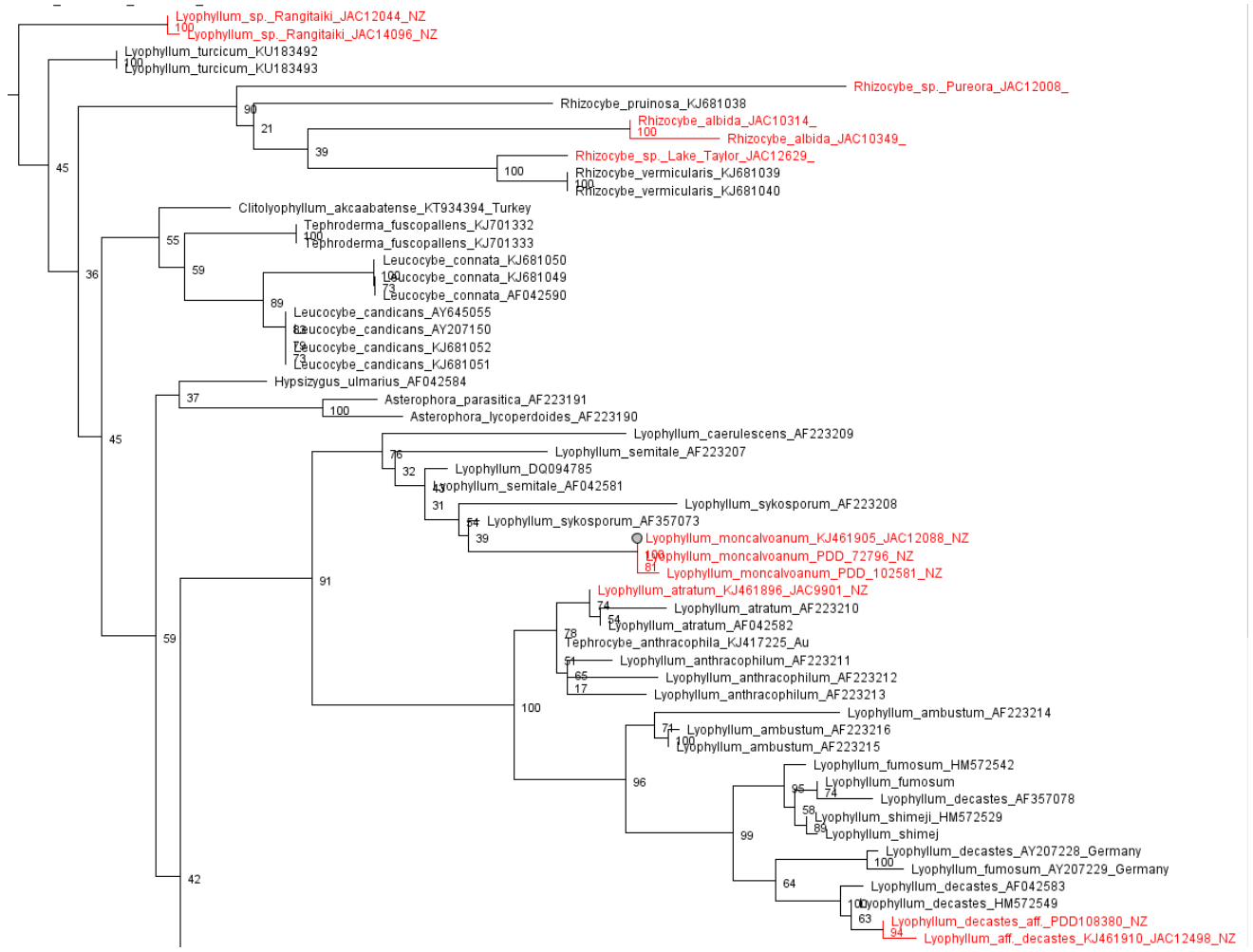








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