Mycological Notes 43

New Zealand Clavariaceae

Jerry Cooper, September 2023

Introduction

Club and coral-like fungi are found in several families in several orders and phyla of fungi. The last revision of (some) club and coral fungi in New Zealand was carried out by Ron Petersen (The Clavarioid Fungi of New Zealand, R. Petersen, DSIR Bulletin No. 236, 1988). At the family level Petersen mentions the Gomphaceae including *Ramariopsis*, *Gomphus*, *Ramaria*, *Kavinia*, *Beenakia* and *Ramaricium*, and the Clavulinaceae including *Clavulina*. The family position of all the other genera treated in the book was not stated. Today our modern phylogenetically based methods mean we can more appropriately place the various genera within an evolutionary framework. The generic placement of the species Petersen included do not always agree with the placement in this report because they have been moved around. For example, most of the species Petersen placed in *Clavicorona* are now in *Artomyces*. In the modern sense the family Clavariaceae includes the genera *Mucronella*, *Clavaria*, *Ramariopsis*, *Clavulinopsis*, *Clavicorona*, *Camarophyllopsis*, *Lamelloclavaria*, *Hyphodontiella* and *Hodophilus*. It should be stressed that there are also many rather similar New Zealand club fungi that belong in other basidiomycete families like the Typhulaceae (*Macrotyphula*, *Typhula*, *Pistillaria*), Clavulinaceae (*Clavulina*, *Multiclavula*), Pterulaceae (*Phaeopterula*, *Pterulicium*, *Deflexula*, *Pterula*), Hydnodontaceae (*Sytinospora*=*Trechispora*), Tremellodendropsidales (*Tremellodendropsis*), Dacrymycetaceae (*Calocera*, *Dacryopinax*).

The family Clavariaceae in New Zealand also contains some gilled fungi like *Hodophilus* and *Camarophyllopsis*. I covered some NZ species in Mycological Notes 38, but a few more have turned up since 2018 and all currently known species are listed at the end of this report without substantial comment. Much more work is required on these groups.

Before the sequencing revolution of the early 21st century we adopted broad morphological species concepts and considered many species to be distributed globally. Modern phylogenetics tells us that species usually have much narrower regional distributions. Species division between hemispheres is absolute for ectomycorrhizal species. It is also generally true for many saprophytic groups in the Agaricales, but perhaps a little less strict in the Clavariaceae. As a consequence, if a species was first described from the northern hemisphere, then it probably isn't the same species we have in NZ. Often our species will be closely related to those older named species, but not identical. In many cases these species were described long ago from places like South-East Asia, and we have very little modern sequenced material for comparison, and which would allow us to establish the modern phylogenetic identity of these older names.

Petersen based his revision on collections from relatively few sites across New Zealand. For the Clavariacaeae many collections came from the Waipoua Forest in Northland. The Northland region has been poorly documented by subsequent mycologists. FUNNZ organised a foray in the area not long ago, but sadly the club fungi were absent at that time. The area is very sensitive due to the potential impact of Kauri die-back and further studies are difficult. The numerous new species described from this site may have a broader distribution, but in general there is a pattern in the Agaricales that many northern species are not widely distributed across the rest of New Zealand.

Consequently, it is not surprising that several species have not been re-found on recent forays. On the other hand, more extensive sampling across the rest of New Zealand has demonstrated the existence of what I believe to be several undescribed species.

From a habitat perspective the club and coral-fungi follow the same patten as the Hygrophoraceae, Geoglossaceae and Entolomataceae. In Europe these groups are common in grasslands, whereas here in New Zealand they are primarily forest-dwelling species, and more common in non-mycorrhizal dominated forests. In general species in the family seem to be more common in North Island than South Island, but rainfall and collecting effort will be significant biasing factors.

In this report I am not attempting to provide much detail about the species, described or not, and neither do I present an identification key. Much more collecting, microscope work and sequencing needs to be done before both can be attempted. Instead, I present the current data as a work in progress, and with a few comments where relevant. I will treat them in the order they appear in the accompanying phylogenetic tree.

Be aware, as usual with mushrooms, that many species simply cannot be named from macroscopic appearance alone. Microscopy is essential, and important characters are clamped hyphae, clamps at the bases of basidia, and the size and eccentricity (Q) of the spores. The spore length is measured from the shoulder of the spore next to the apiculus to the opposite side, and at right angles. If you are interested in seeing the micro-details then search for collections on https://scd.landcareresearch.co.nz/ and often they will be accompanied by my notes and associated micrographs.

In his 1988 book Petersen included microfiches with photographs of many of the included species. I scanned these years ago and they are incorporated into this report. Many of the photographs in the old fiches have developed a significant colour balance issue over the years before I scanned them, so do not trust the colours!

You will find web pages and field guides with named species of club fungi from New Zealand. Those identifications should be treated with caution. I am also not immune from mis-identifications and no doubt some species I will have misidentified.

I have applied my usual practice with undocumented species and if a sequenced species turns up multiple times from different localities, then I have given it a tag name. The PDD number in brackets following the tag name should be regarded as a pseudo-type, to anchor the use of the name. These tag names are very useful for tracking information about undescribed species.

The diversity in the group is high and only a fraction have been documented. In *Clavaria* I have added 8 undocumented species to the previous total of 25, in *Clavulinopsis* 13 species to the prior total of 12, and in *Ramariopsis* 12 to the prior total of 19. In total that is about 89 species with 38% added recently. It is clear from scanning iNaturalist observation that 89 is still a fraction of the total number of species in Clavariaceaea in New Zealand.

A useful global site by one of the currently active mycologists on the Clavariaceae may be found here: https://www.clavariaceae.org/clavulinopsis-subg-clavulinopsis

These notes would not have been possible without the contribution of specimens and photographs from the few forayers who have negotiated collecting permits. I am especially grateful to Gray Smith, Peter de Lange and Wanda Daley.

Mucronella.

Type species *M. calva*, Europe, 1874

This genus was not treated by Petersen. Species grow as white to yellowish downward hanging spines on dead wood. The spines are separated with no subiculum (basal pad of hyphae) connecting them. Unfortunately, there are several similar genera and microscopy is needed to resolve generic placement, *Pterulicium* etc.

Mucronella calva aff.

Mucronella calva was originally described from Germany. Our species is closely related, but not the same. Compare with *Dentipellis leptodon*, with a subiculum, and *Pterulicium* which grows in fasciculate clumps. Here the spines are 2-3mm long.

JAC11392/PDD 95742, SI

***Mucronella pendula,* type Tasmania, 1899**

One NZ collection has a sequence which agrees with one Australian collection under this name. However, the New Zealand material has spores 8.3 x 6 µm (originally described as 8.5 x 6 µm), but it seems to have long (>150 µm) thick-walled whiplash-like hairs. More collections are needed to confirm the microscopy. *Mucronella pendula* has a characteristic narrowing of the stipe base and a conical 'icicle'. As originally described it is around than 1cm long. Much larger specimens have been reported and need detailed investigation.

JASC16502/ NS4235/PDD 113646, NI

Mucronella sp. 'Orokonui (PDD 106130)'

M. sp. 'Orokonui' is rather similar to *M. pendula* except the icicle is more rounded at the base – probably. The spores are larger (12 x 9 µm) and more rounded. I suspect the fruitbodies are smaller than *M. pendula* but we have no details of scale.

JAC13927/iNat 1467228/PDD 106130, SI

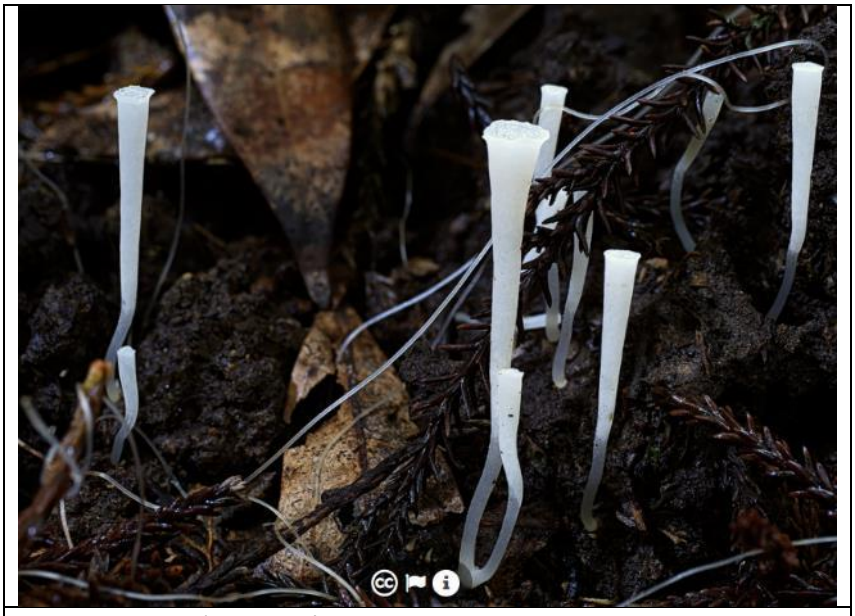
PDD 112079, SI

Clavicorona

Type *C. taxophila*, New York, 1904

Petersen included our *Artomyces* species under *Clavicorona*, but the two genera are unrelated. The real genus *Clavicorona* is certainly present in both Australia and New Zealand. We have no collections in PDD and there are no sequences available for Australasian collections. It seems doubtful our species is the northern hemisphere *C. taxophila* which is usually associated with *Taxus*. Collections are needed.

***Clavicorona* sp.**



iNat 49388266 ‘noeelleb’, SI

Clavaria

Type species *Clavaria fragilis*, Denmark, 1790.

Species of *Clavaria* can occasionally be difficult to separate from *Clavulinopsis*. Indeed, Petersen treated *Clavulinopsis* as a subgenus of *Clavaria*, but it is now recognised as a separate genus. *Clavaria* remains paraphyletic and new genera are required for at least the *C. argillacea* clade, subgenus *Holocoryne* and the *C. fumosa* clade.

To be certain you have a *Clavaria* (sensu lato) you need to examine the hyphae to determine if clamp connections are present or not, and within *Clavaria* the subgenus *Holocoryne* is distinguished by having large loop-like clamps at the base of the basidia. The presence of these clamps seems to make tissue difficult to squash on a slide and so they are sometimes tricky to see. Often you are left with bifurcate fractured base to basidia, which is itself diagnostic. Macroscopically if you have a white unbranched species then you can be sure it is *Clavaria*. If it is yellow/orange/pink, relatively large and fleshy, then it is a *Clavulinopsis*. If it is yellow and small, and not fleshy, then you need microscopy. Sometimes the spores of *Clavaria* can exhibit gross spines but sequenced material suggests it is not of diagnostic value. Within a species (and even a single collection) these large irregular spines can be present or absent, or both. For this reason, I have synonymised some species that appear to differ only in that character – and I may be wrong.

First, we will cover the species for which we have modern sequenced collection. At the end of each genus/subgenus I include the residual unsequenced species covered by Petersen and for which we do not have modern material.

***Clavaria aff*. incertae sedis**

In an ITS/LSU phylogeny this species is placed (with poor support) outside the *Clavaria* clade and near the gilled genus *Lamelloclavaria*. I doubt that is correct and more genes are required. Morphologically and microscopically, this is *Clavaria fragilis*-like. It is relatively large and very fragile. It starts white and becomes more branched and browner with maturity. Fruitbodies are about 10cm tall.

JAC 16739/ PDD 113869, SI

JAC 17204/ PDD 114314, SI

JAC 17439/ PDD 114550, SI

Clavaria argillacea clade

This group look untypical for *Clavaria* and indeed some were named in *Geoglossum* long ago. It requires a new genus name.

Clavaria JAC11186

Hyphae unclamped, without basal clamps to the basidia, spores smooth, globe. Potentially an introduction is a modified habitat.

JAC11186/PDD 95645, SI

***Clavaria cupreicolor*, NZ type, 1 coll. Mill Bay (NI)**

We have no photo of this species and there is just the single holotype collection. It was described as 6cm tall and copper coloured. Type collection sequenced.

***Clavaria muscula* cf.**

2-3cm tall. The spores in this collection are 7.5 x 6 µm and may represent *C. muscula* described from Australia. Material dried very dark. *Clavaria plumbeoargillacea* may perhaps belong in the same group.

JAC17967/NS6029/PDD 115077, NI

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Clavaria subgenus *Holocoryne*

Type species *Clavaria acuta*, UK, 1801.

***Clavaria ardosiaca*, type Waipoua, 2colls (NI).**

Syn. *C. musculospinosa*, type Waipoua, 4 colls (NI)

Apparently to 12cm tall. We have just one modern sequenced collection that may be this species, and it has no photograph. Petersen's original photos suggest something that superficially looks like a typical grey Clavulina. It has a fasciculate growth. Having examined type collections, I believe *C. ardosiaca* and *C. musculospinosa* are the same species and the presence/absence of spines is variable.

TENN 42264 as C. ardosiaca

TENN 43540 as C. musculospinosa

***Clavaria alliacea* cf., type Malaysia, 1950**

Clubs under 2cm, white. There are several small white *Clavaria* species that have a strong odour of garlic when crushed, and all in subgenus *Holocoryne*. I think microscopy is probably needed to separate them. This collection conforms to Petersen's *C. alliacea* cf. which he included with some uncertainty and based on an earlier collection/description from Stewart Island by Derek Reid. The collection here has 2-spored basidia and the spores are spiny, 10 x 8 µm. The species was originally described from Malaysia. This seems to be a species where the spores are variable spiny or smooth.

JAC14425/PDD 106960, SI

***Clavaria echino-olivacea*, type Waipoua, 5 colls (NI)**

Syn? *C. ypsilonidia*, type Waipoua, 3 colls (NI)

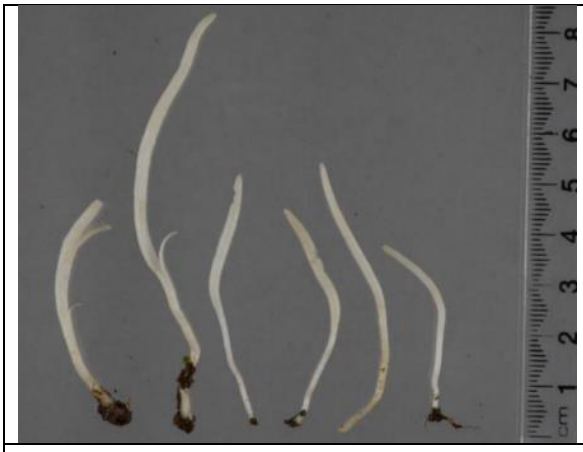
Clubs to 9cm tall, white, cream to pale greenish yellow. LSU sequences of the type collections of *C. echino-olivacea* and *C. ypsilonidia* are 99% similar (even though they separate in the tree). Morphologically they are separated by spore ornamentation and shape; *C. echino-olivacea* has spores spiny and globose, *C. ypsilonidia* has spores smooth and subglobose. It is possible that the greater discrimination of ITS may indicate two separate species, but currently I am treating them as one species. Unfortunately, we have just one recent collection matching exactly the type of *C. ypsilonidia*. A possible distinctive character is a slight greenish tinge to the mature fruitbodies. It is likely that the seemingly common *C. subsordida* should be in this part of the tree.

	
TENN 43685 as *C. echino*olivacea	TENN 43607 as *C. echinoolivacea*
	
TENN 43654 as C. ypsilonidia	© C. Shirley, PDD 81507, NI

***Clavaria redoleoalii*, type Karamea, 9 colls (NI/SI)**

Clubs to 7cm tall, white to pallid yellow. As the name suggests this species has a garlic odour when crushed. However, that character is possessed by several macroscopically similar species and microscopy is needed to differentiate them. The sequences for *C. redoleoalii* suggest we have a complex of at least two closely related species even within the strict sense of that name. C*. redoleoalii* #2 is generally a much larger species, to 6cm tall versus 2cm for #1.

	
TENN 43599	#1. JAC14853/NS2679/PDD 107069, SI
	
#1 JAC14916/PDD 107132, NI	#2 JAC14859/PDD 107075, SI
	
#2 JAC17314/PDD 114424, SI	#2 JAC15917/PDD 113064, NI

	
#2 PDD 105311, NI	

***Clavaria gibbsiae*, Type Malaysia, 1917, 7 NZ colls (NI/SI)**

Clubs to 7cm, white, cream to pale yellow. This yet another garlic smelling species. It was originally described from Malaysia and the NZ version may be a different species. The NZ species was described as spiny spored, but JAC11561 has no spines.

	
TENN 43550	JAC11561/PDD 95954, SI

Clavaria JAC17821

Clubs to 8cm, white to tan. This one does not smell of garlic, and a potential candidate for *C. subsordida* (less robust). See also *C. subacuta* cf. & *C. fragilis* for other white, small, gregarious, non-garlic smelling species that do not have clamps on the basidia.

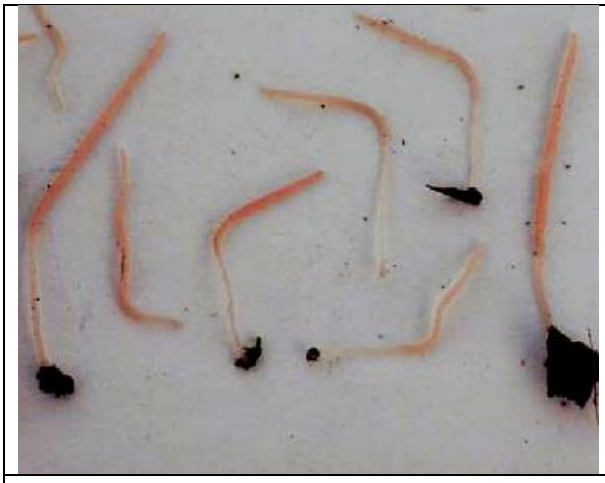
JAC17821/NS5883/PDD 114931, SI

***Clavaria megaspinosa*, type Waipoua, 5 colls (NI/SI)**

Clubs to 5cm, pale to deep pink.

JAC14897/NZ2678/PDD 107113, SI

JAC16538/PDD 113681, SI

	
TENN 42418	

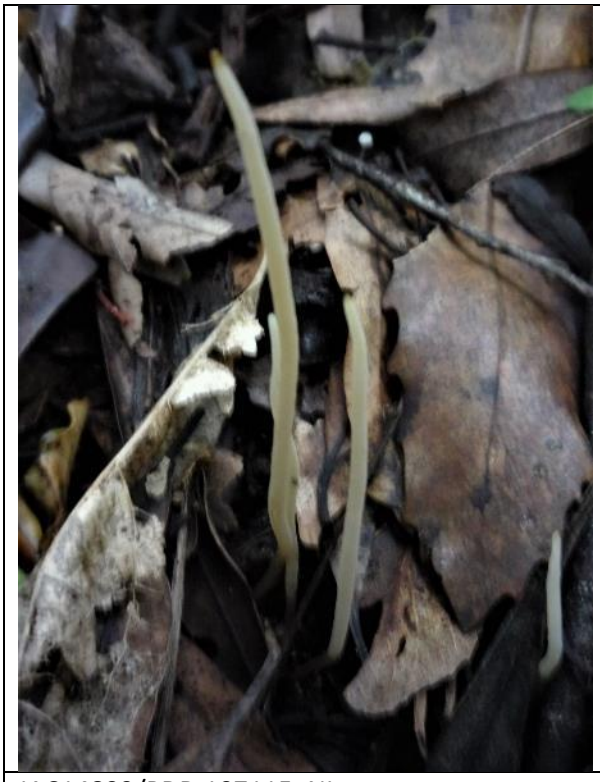
***Clavaria stegasauroides*, type Australia (SA), 1978**

Clubs to 3cm, deep red to maroon. This distinctive species was not included by Petersen, but the NZ material agrees in morphology and sequence data with Australian collections.


JAC14852/PDD 107068, NI

***Clavaria subsordida*, type Waipoua, 12 colls (NI/SI)**

Clubs to 4cm, tan to greenish yellow. The collection listed here is potentially *(C. subsordida* cf.) This collection dried with a yellow stipe base, spores 8 x 6.3. For Petersen *C. subsordida* was common so it is odd that we have just one collection, and even that doesn't quite fit. Perhaps I have misidentified other collections.

	
JAC14899/PDD 107115, NI	*Clavaria subsordida* Type locality Waipoua Forest Northland (11 colls, NI). TENN no. 42382

***Clavaria sp. 4*, 1 coll (SI)**

Clubs to 5cm, purple. Petersen included several unnamed entities, and this conforms to his *Clavaria* Taxon no. 4.

JAC9617/PDD 83736, NI

***Clavaria alboglobospora*, type Waipoua, 1 coll (NI)**

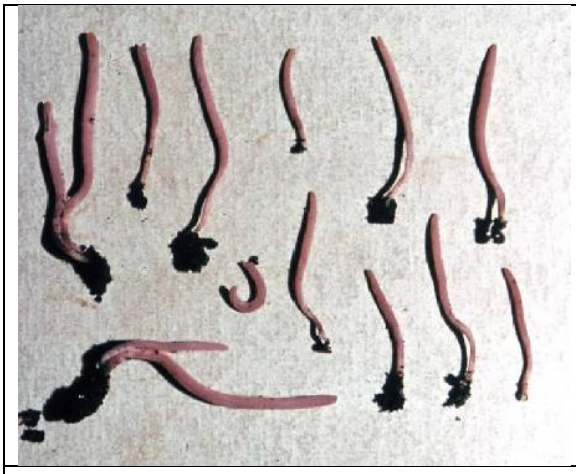
Clubs to 10cm, pale cream to pale yellow. A tall and densely fasciculate white species, rather than gregarious, and no odour. Type collection sequenced.

	
JAC15834/PDD 112981, NI	JAC17756/NS5825/PDD 114866, SI

***Clavaria subviolacea*, type Waitakare, 1 coll (NI)**

Clubs to 3.5cm, dull violet (to pink according to sequenced collections). *C. subviolacea* and *C. roseoviolacea* are rather similar. Petersen separated them primarily by colour, with *C. subviolacea* violet and *C. roseoviolacea* more pink, and the latter somewhat taller. However, both species are variable in colouration and the character overlaps. More informative is the spore shape, with *C. subviolacea* Q=1.5, and *C. roseoviolacea* Q=1.2.

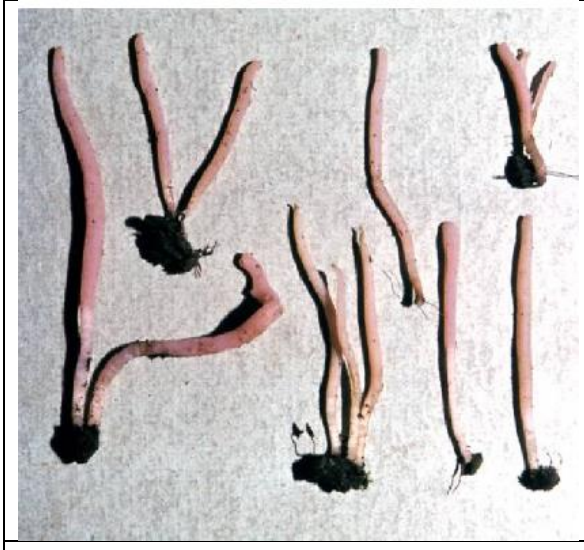
	
JAC14150/iNat 3517098/PDD 106315, SI	JAC15904/iNat 30975050/PDD 113051, NI

	
Horak no. 1030	

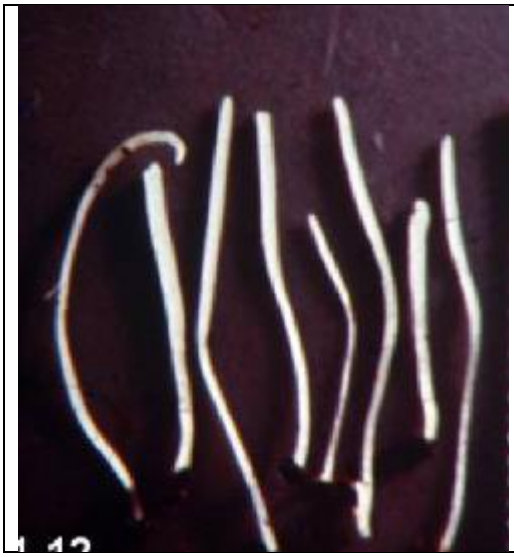
***Clavaria roseoviolacea* type Mill Bay, 7 colls (NI)**

Clubs to 7cm, pale pinkish violet.

	
JAC14915/iNat 13900229/PDD 107131, NI	JAC17755/NS5824/PDD 114865, SI

	
JAC15786/iNat 26377491/PDD 112933, NI	JAC14630/iNat 6804481/PDD 106509, NI
	
Horak no. 1029	

Missing species in *Clavaria* subgenus *Holocoryne*

	No. Photo

Clavaria acuta cf, TENN no. 43602. 3 colls, (NI). Clubs to 5cm, white to cream. The original described from the UK. The name often used for gregarious, small white, non-garlic smelling species. See also *C. subsordida*.	*Clavaria echinobrevispora*. Type locality Waipoua Forest Northland, 1 coll, (NI). Clubs to 3cm, white to pale yellow.
	
Clavaria luteostirpata TENN no. 43587, described from Australia (Vic). 2 colls (NI). Clubs to 6cm, greenish yellow to apricot yellow. A yellow species that no doubt gets mistaken for a *Clavulinopsis*. The same/related NZ taxon should be sought.	*Clavaria mima* TENN no. 43608 Type Pelorus, 1 col (SI). Clubs to 4.5cm, cream to dull pale yellow.
	
Clavaria plumbeoargillacea Horak no. 1064 Type Auckland, Mill Bay, 2 colls (NI). Clubs to 8cm, grey becoming blue-grey.	*Clavaria tuberculospora* TENN no. 43554 Type Waipoua, 5 colls (NI/SI). Clubs to 8cm, white, pale tan to pale yellow

Clavaria subgenus *Clavaria*

Type species *Clavaria fragilis*, Denmark, 1790

Clavaria fragilis was not recorded by Petersen. He recorded a single collection he called *C. subacuta* cf. which may sit in the same complex. The type of *C. subacuta* was described from Japan, and a sequenced collection places it within subgenus *Holocoryne* and not subgenus *Clavaria*. In New Zealand it appears we have several unnamed species, all with a *C. vermicularis*- look, and some with furcate clubs. See also the entry for *Clavaria* aff, which may, or may not belong here.

***Clavaria fragilis* aff. #1**

Clubs to 5cm, white to pale yellow, drying pale yellow. This species has branched clubs and known only from the Kermedec Islands

JAC16677/PDD 113809, Raoul Island

***Clavaria fragilis* aff. #2**

Clubs to 5cm, white becoming yellow towards apex, drying pale yellow. This species has fruitbodies that are tinged yellow/green. Potentially, Petersen's *Clavaria* taxon no. 1.

JAC15699/PDD 112847, NI

***Clavaria fragilis* aff. #3**

Clubs to 1.5cm, white becoming pale yellow, drying pale yellow. Probably not fasciculate, despite the appearance. The spores are 5.9 x 3.6 µm (Q=1.63) and so not a candidate for Petersen's *C. subacuta* cf.

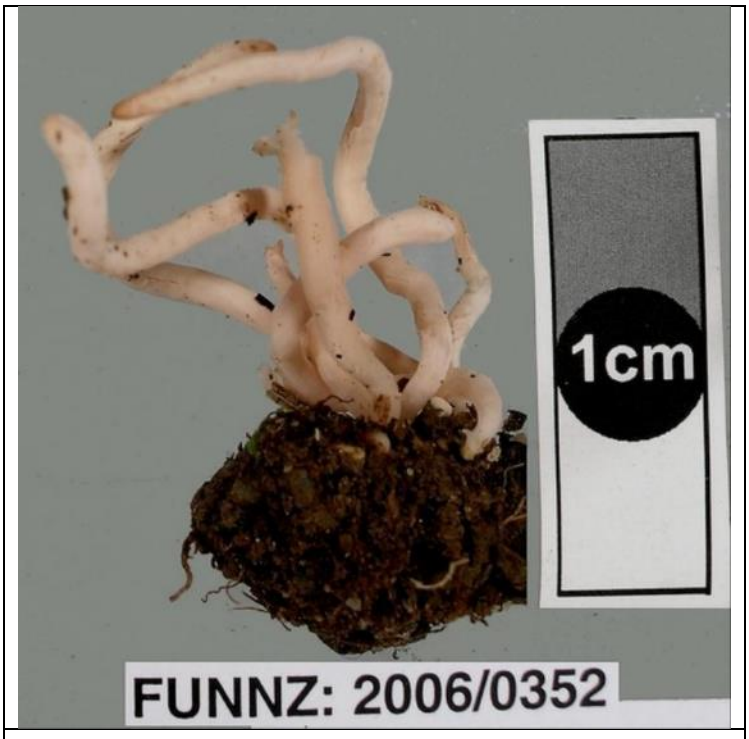
JAC15610/PDD 112759, NI

Clavaria fumosa clade

This group requires a new generic name. Species are pigmented, clustered, generally relatively large and fragile.

***Clavaria rubicundula* cf., type Michigan, 1956, 2 NZ colls (NI)**

Clubs to 7cm, rosy pink. Petersen noted a species which he compared with the North American *C. rubicundula*, and this is indeed closely related. We need a better collection and photo.



PDD 89863, SI

***Clavaria zollingeri* complex, type Java, 1846, 2 NZ colls (NI)**

Clavaria zollingeri is on the European red data list. However, the use of the name clearly incorporates a globally distributed species complex at it seems unlikely the name is being used correctly in Europe. Even within New Zealand we have multiple species under this name.

***Clavaria zollingeri* sensu NZ #3**

PDD 108617, SI

***Clavaria zollingeri* sensu NZ #2**

Clubs to 12cm, deep violet-grey.

Gregarious, not branched and so not typical of the *C. zollingeri* group. Spores smooth, to 4 µm, globose. *Clavaria plumbeoargillacea* and *C. muscula* have larger spores.

JAC14874, PDD 107090, SI

***Clavaria zollingeri* sensu NZ #1**

Clubs to 6cm, violet. Morphologically the closest to the northern hemisphere species

	
JAC14886/iNat13414561/PDD 107102, NI	JAC13837/PDD 106042, NI
	
JAC17787/NS5856/PDD 114897, SI	

Missing species in *Clavulina* non *Holocoryne*

	
Clavaria echinonivosa TENN no. 43607. Type Waipoua, 5 colls (NI). Clubs to 6cm, white, waxy.	*Clavaria subacuta* cf Horak no. 1034. Type Japan, 4 NZ colls (NI/SI). Clubs to 3.5cm, white to cream. This taxon will no doubt sit in the *C. fragilis* group, q.v.
No Photo	No Photo
Clavaria Taxon No. 1, 1 coll (NI). Clubs to 3cm, light yellow. Spores 7 x 5.5 µm	*Clavaria muscula*, Type Australia, 1 NZ coll (NI). Clubs to 8cm, bluish grey. Spores 7.5 x 5.8 µm. See JAC17967.

Clavulinopsis

Type species *Clavulinopsis sulcata*, Java, 1923

Petersen's concepts of *Ramariopsis* and *Clavulinopsis* (as *Clavaria* subgenus *Clavulinopsis*) have not stood the test of time. Many of the species he placed in *Ramariopsis* subgenus *Laevispora* belong in *Clavulinopsis*. He separated the genera by the reaction of fruitbodies to Iron salts (FeCl) becoming green/black in one group and no reaction in the other. Unfortunately, the character has no phylogenetic significance (it is homoplasic). Petersen's *Ramariopsis* species belonging in *Clavulinopsis* include *R. antillarum*, *R. simplex*, *R. ovispora*, *R. laeticolor*, *R. depokensis*, *R. luteotenerrima*, *R. aurantio-olivacea*.

Species in the genus *Clavulinopsis* tend to be relatively large, fleshy and with carotenoid pigments. Microscopically they have clamp connections on the tramal hyphae. The colours can be quite variable within species, as can the degree of fleshiness.

Clavulinosis subgenus *Donkella* ined.

Type species *C. corniculata*, Germany, 1774

C. corniculatata is a yellow branched species. This group has moved around a bit and placed in *Ramariopsis* even quite recently, albeit with poor support (DOI: 10.3852/11-121). The clade containing *Clavulinopsis corniculata* (including a sequence of the epitype) has a reasonably high support (71%) for a relationship to two sequenced NZ species. I don't believe this relationship is correct because the NZ species have no clamps on the hyphae, non-carotenoid pigments, branched fruitbodies, and small spores. This morphology is distinctly *Ramariopsis* and not *Clavulinopsis*. I can offer no explanation for what is going on in this part of the phylogeny. More genes need sequencing. It is possible that *Ramariopsis alutacea* belongs here.

Clavulinopsis-Ramariopsis JAC14627

The stipe base is yellow, which is not apparent from the photo. We have no sense of scale.

JAC14627/iNat 6737438/ PDD 106506, NI

Clavulinopsis -Ramariopsis p. 'Keith George (PDD 106040)'

Clubs to 4c, white to tan. Probably two species here. Both with unclamped hyphae and small spores. For a superficial morphology like JAC13835 see *Ramariopsis cinnamomea* cf.

	
JAC 13835/ PDD 106040, NI	JAC15913/iNat 28243392/ PDD 113060, NI

Clavulinopsis subgenus *Clavulinopsis*

People seem to use names like *C. sulcata* and *C. corallinorosacea* rather broadly. The reality is that colours and form are rather variable and species-level identification needs microscopy. Guesses based on macro-morphology will often be wrong. To try assist the disentangling of the yellow species I prepared Table 1 which shows some of variation and differences in key characters. The reddish-pink species seem to be concentrated in the *C. sulcata* clade, and the tricky yellow-orange species in clade B, although noting there are exceptions.

Clavulinopsis sp. 'Totaranui (PDD 105661)'

Clubs to 4cm, orange to red-orange. Tissue not exuding pigment into KOH. Spores smooth, 7 x 6.2 µm, Q=1.12

	
JAC13409/ PDD 105661, SI	JAC14507/ PDD 106958, NI

***Clavulinopsis novozealandica*, type Upper Hutt, 9 colls (NI/SI)**

Clubs to 5cm, bright yellow to apricot yellow, terete, sulcate. Type collection sequenced. If any collection is yellow and fleshy then it is probably this species. *C. sulcata* is much more pink.

	
JAC14501/ PDD 107021, NI	TENN 43575

***Clavulinopsis sulcata*, type Java, 1923, 13 NZ colls (NI/SI)**

Clubs to 7cm, pale pink to salmon pink. The NZ species under this name is rather variable in colour and form, and it also occurs in Australia. I strongly doubt these are the same as the original *C. sulcata* from Java. There are sequences of several species deposited under this name from various regions and they are different. It seems likely that deposited sequences of Philippines material will be closest to the original species. The species in this clade change from pink to pale yellow when they dry.

JAC14504/PDD 107024, NI

JAC17865/NS5927/PDD 114975, SI

JAC13836/PDD 106041, NI

JAC14506/PDD 106852, NI

	
JAC14869/iNat13865572/PDD 107085, NI	JAC14502/PDD 107022, NI
	
JAC14503/PDD 107023, NI	Horak no. 614

Clavulinopsis Clade B

The yellow NZ *Clavulinopsis* species are identified with difficulty. Petersen noted the species he described had a correlation between spore eccentricity and colour, with more globose spored species having lemon colours and eccentric spored species with deepening orange colours. Unfortunately, *C. sp. 'Manawatu'* and *C. ovispora* do not fit this correlation. I prepared Table 1 with some of the key features for each species.

Clavulinopsis sp. 'Manawatu (PDD 107082)'

Clubs to 4cm, golden yellow. Using Petersen's keys, one would arrive as *C. spiralis* (auct NZ) or *C. antillarum*, and this is neither (although both those names are used broadly). The fruitbodies in this species seem to bruise/gelatinise rather easily.

	
JAC14866/iNat13575637/PDD 107082, NI. Spores 3.4 x 3.4,Q=1	PDD 105310, NI

Clavulinopsis JAC16834

Clubs 1cm, deep orange.

JAC16834/PDD 113964, Stewart Island

***Clavulinopsis persicina*, type Pelorus, 9 colls (NI/SI)**

Clubs to 8cm, pale salmon to apricot, orange (and yellow according to sequenced collections). Usually uninflated (non-sulcate).

PDD 81499, © Clive Shirley, NI

JAC14861/PDD 107077, SI

JAC16195/NS3928/PDD 113340, SI

JAC16920/PDD 114050, Stewart Island

JAC17856/NS5918/PDD 114966, SI

JAC17854/NS5916/PDD 114964, SI

	
JAC16786/PDD 113916, Stewart Island	JAC14855/PDD 107071, SI
	
JAC16827/PDD 113957, Stewart Island	JAC14858/PDD 107074, SI
	
JAC11996/PDD 96251, NI	JAC14914/PDD 107130, SI

	
TENN no. 43558	

Clavulinopsis sp. 'Lake Rotoatua (PDD 113497)'

Clubs to 6cm, bright yellow. NZ sequences close to an Australian deposit as *C. antillarum*. Microscopically I can find nothing to distinguish this species and the one I have decided to call *C. antillarum*. The spores are globose and around 5 µm diam. This part of a complex that includes *C. antillarum*, *C. amoena*, *C. simplex* etc.

	
JAC14863/PDD 107079, SI	JAC16353/NS4086/PDD 113497, NI. Spores

Clavulinopsis sp. 'Okataina (PDD 115064)'

Misapplied? *Clavulinopsis luteotenerrima,*type Java.

Clubs to 6cm, bright yellow. The spores here are distinctly eccentric, Q=1.6, which excludes C*. antillarum*. Petersen's description of *C. luteotenerrima* is closer in spore eccentricity but I will maintain this as a distinct taxon.

JAC17954/NS6016/PDD 115064, NI

Clavulinopsis JAC17886

Clubs to 1cm, scarlet. The collection is immature (no spores) and may look quite different at maturity. More collections are needed.

JAC17886/NS5948/PDD 114996, NI

Clavulinopsis JAC17829

Clubs to 7cm, deep salmon pink. This is one of our *C. corallinorosacea* look-alikes, and indeed this is closest to an Australian sequence under that name, but still only 91% similar on ITS.

JAC17829/NS5891/PDD 114939, SI

Clavulinopsis sp. 'Woodside Glen (PDD 87597)'

Misapplied *Clavulina corallinorosacea*, type Australia, 15 NZ colls (NI/SI)

Clubs to 5cm, bright rosy pink (but colours actually quite variable). This is *C. corallinorosacea* NZ in the sense of Petersen. It is not the same as the Australian original (91% similar on ITS to an Australian deposit under that name). It should be noted that the Australian species was originally described as coral red or rosy pink and drying paler but the name is often used incorrectly for species with a much redder colour.

	
JAC13339/PDD 105592, SI	JAC15915/iNat28382281/PDD 113062, NI
	
JAC10750/PDD 87597, SI	JAC14652/iNat6851165/PDD 106531, NI

	
JAC14862/iNat13854472/PDD 107078, NI	© Clive Shirley, PDD 83118, NI
	
TENN no. 43569	

Clavulinopsis sp. 'Fern Walk (PDD 107073)'

Clubs to 5cm, mid yellow. Morphologically part of the *C. amoena*, *C. antillarum*, *C. spiralis* complex. JAC15772 with spores 6.3 x 4.5 µm Q=1.38, JAC14857 with spores 6 x 5 µm , Q=1.27. The spores make this nearest to *R. ovispora* but I'm not convinced this really has fasciculate growth or orange yellow in colour.

	
JAC14857/iNat13890645/PDD 107073, NI	JAC15772/PDD 112920, NI

***Clavulinopsis simplex,* name invalid, no type designated, 11 colls. (NI/SI)**

The status of his name is problematic because of the wording that Petersen used when it was introduced. At first glance one might think he was introducing a stat. nov./comb.nov. based on *Clavaria corniculata f. simplex* Donk, type (and selected Lectotype) from the Netherlands. However, he indicates the 'Pacific fungus' is different and in need of a new name, *R. simplex* sp. nov., for a different species. That introduces a problem because no type collection was explicitly designated, and the protologue refers to multiple collections. I recently re-combined Petersen's *Ramariopsis simplex* in *Clavulinopsis* and both names are invalid.

Clubs to 7cm, yellow range to ochraceous yellow. The species is part of a complex that needs better resolution.

	
JAC17768/NS5837/17768, NI	JAC13839/PDD 106044, NI

	
JAC16575/PDD 113718, NI	JAC14856/PDD 107072, NI
	
JAC14864/PDD 107080, SI	

***Clavulinopsis aurantio-olivacea,* type Omahuta, 10 colls (NI)**

Clubs to 3cm, yellow to greenish and orange. Commonly recorded by Petersen and yet we have just one sequenced Petersen collection and nothing modern that corresponds to it.

TENN 42409

Clavulinopsis sp. 'Lottery Bush (PDD 114362)'

Misapplied? *Clavulinopsis laeticolor* NZ sensu Petersen NZ

Clubs to 6cm, bright golden yellow. Spores 6 x 4.5 µm, Q=1.32. The spathulate form of JAC14887 might suggest *Clavulinopsis archeri* but the spores are wrong. The cylindrical form is a strong contender for Petersen's NZ concept of *C. laeticolor*, with orange reddish fruitbodies and elongate spores.

JAC14887/iNat13458943/PDD 107103, NI

JAC17252/PDD 114362, SI

***Clavulinopsis* PDD 12140**

The microscopy of this collection needs checking to see if it conforms to one of the missing yellow species.

PDD 12140, NI

***Clavulinopsis archeri*, type Tasmania, 1859, 1 NZ coll (NI)**

Clubs to 3cm, pallid yellow-orange, branching. *C. archeri* was originally described with flattened, branched clubs. There are no Australian sequences for comparison and so equivalence cannot be confirmed. Some NZ collections show the form of the description, and others do not, whilst other yellow species may also be sparingly branched and flattened (see *C. antillarum* of these notes). Collections here that are not flattened/branched could easily be mistaken for one of the other yellow species. Here the spores are subglobose to 5 µm.

JAC14888/iNat13539470/PDD 107104, NI

JAC17862/NS5924/PDD 114972, SI

JAC14083/PDD 106252, SI

JAC14631/iNat6715025/PDD 106510, NI

***Clavulinopsis amoena*, type Indonesia, 1844, 3 NZ colls (NI/SI)**

Clubs to 5cm, bright yellow. Petersen used this name in a broad sense for a species with rather elongate spores (Q=1.5), and yellow rather than orange (=*C. depokensis*, Q=1.3). There are sequences under this name from Australia, Thailand and China, and they represent three quite different species. The NZ species I am calling *C. amoena* is a fourth. Even within NZ we have the issue of correctly resolving *C. amoena*, *C. spiralis*, *C. antillarum, C. simplex* and two undescribed similar yellow species. See table 1. The spores here are 8 x 5 µm, Q=1.6.

	
C. amoena cf. PDD 108445, NI	TENN no. 43573

Clavulinopsis sp. 'Murphys Bush (PDD 81207)'

Misapplied *Clavulinopsis spiralis*, type Java, 1838

Clubs to 5cm, bright yellow. This is one of the *C. antillarum*, *C. am*oena, *C. simplex* complex. *C. spiralis* is yet another of the elusive species described from Java in the 19th century. Petersen included a species under this name in his key, but did not discuss it further. Q=1.06.

	
© Clive Shirley, PDD 81207, Spores 6.2 x 6.0 µm, Q=1.03, NI	TENN no. 43797

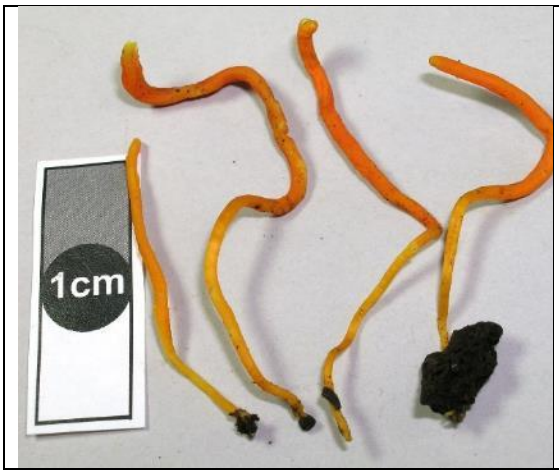
***Clavulinopsis antillarum*, type Guadeloupe, 1903, 16 NZ colls. (NI/SI)**

Clubs to 5.5cm, bright yellow to apricot yellow to greenish-yellow. Name used in the sense of Petersen NZ, but note the presence of a species complex that seems difficult to resolve. Spores Q=1.1.

	
JAC17791/NS5860/PDD 114901, SI	JAC14629/iNat6309502/PDD 106508, NI
	
PDD 112016, SI	TENN no. 43530

Clavulinopsis sp. 'Whirinaki (PDD 115068)'

Clubs to 7cm, reddish orange. Potentially multiple species here. The macro and micro-morphology of these two collections are quite different.

JAC9622/PDD 83770, NI	JAC17958/PDD 115068m NI

***Clavulinopsis depokensis*, type Java, 1923, 20 NZ colls (NI/SI)**

Clubs to 7cm, bright orange-yellow. This name used broadly in the sense of Petersen NZ. It is probable the phylogeny indicates multiple NZ species (at least two or three). Spores Q=1.3-1.4. The similar *C. laeticolor* NZ (=*C. sp. 'Lottery Bush'*) has spores with about the same eccentricity but usually with orange/red tints somewhere.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>#1: JAC15906/iNat28381344/PDD 113053, NI</td><td>#2: JAC14854/NS2828/PDD 107070, SI, 6.8 x 4.9 µm, Q=1.44</td></tr>
<tr><td>  </td><td> 
</td></tr>
<tr><td>#2: JAC14890/iNat13341965/PDD 107106, NI</td><td>#3: JAC14505/PDD 106922, NI, 5.8 x 4.6, Q=1.2</td></tr>
</table>

	
#3: JAC12588/PDD 96712, NI	JAC13441/PDD 105693, SI
	
#3: JAC14868/iNat13867537/PDD 107084, NI,	#3: JAC17716/NS5784/PDD 114826, SI,
	
JAC16697/iNat13471943/PDD 113829, NI	Segedin no. 1815

Missing species in *Clavulinopsis* subgenus *Clavulinopsis*

	
Clavaria flavopurpurea TENN no. 42492., type Waipoua, 4 colls (NI). Clubs to 7cm, multi-coloured yellow/purple bands.	*Ramariopsis ovispora* Horak no. 585, type Puketi, 4 colls, (NI/SI). Clubs to 8cm, brilliant orange yellow. See C. sp. 'Fern Walk'
	No Photo
Clavulinopsis laeticolor, type Cuba, 1863, 13 NZ colls, (NI/SI). Misapplied. See 'Lottery Bush'	*Clavulinopsis luteotenerrima*, type Java, 1923, 3 NZ colls (NI). Clubs to 5cm, bright yellow. See C. sp. 'Okataina'

Ramariopsis

Type species *Ramariopsis kunzei*, Europe, 1821

Species of *Ramariopsis* tend to be relatively small, without carotenoid pigments, branched fruitbodies and small minutely verrucose or smooth spores (perhaps verrucose below optical resolution?), and the hyphae are clamped. The spores often appear thick-walled and dextrinoid, especially in mass. The dextrinoid character appears to be more common with rough spored species than smooth, although that is not absolute and some of my smooth spored species are clearly

dextrinoid. I'm not sure the character is consistent within species and so I have not used it for identification. *R. ramarioides* and *R. sp. 'Mt Lees'* are somewhat larger and atypical in form for the genus, and both sometimes confused with *Ramaria* and/or *Phaeoclavulina*.

In Petersen's treatment the species currently placed in *Ramariopsis* were split between some of his *Ramariopsis* subgenus *Laevispora* (with the rest now in *Clavulinopsis*) and all his *Ramariopsis* subgenus *Ramariopsis*. Petersen used the term hysterochroic to describe some species. These are species that darken in colour with age starting at the base and extending upwards to the branches. The colour changes I have noted are from white to creamy/yellow, or from white to distinctly pink colour. In addition, species seem to uniformly darken with age. Presence/absence of these changes is variable, depending on the age of the fruitbodies, thus making identification based on colour character rather difficult. The smaller species can be difficult to separate, and I prepared Table 2 with some of the key characters.

***Ramariopsis pulchella*, type France, 1887, 5 NZ colls. (NI)**

Clubs to 2cm, blue-violet. To date we have just a single sequence of this small violet and delicate species. It is not closely related to the epitype of *R. pulchella*. The variable morphology of NZ collections suggests it is possible we have multiple species under this name. We do have a unphotographed collection which conforms to Petersen's *Ramariopsis sp. 3* which seems to be a smooth spored version and more robust version of *R. pulchella* and does have a sequence much closer to the epitype.

	
JAC 16286/ NS4021/ PDD 113431, NI	TENN no. 42439

Ramariopsis sp. 'Mt Lees (PDD 107109)'

Clubs to 4cm, cream to deep pink cinnamon. This species is rather similar to *R. ramarioides*. Initially I tried to make this Petersen's *R. cinnamomea cf.*, originally described from Australia but that does not generally have the form of the species shown here, except for JAC15526. There are no Australian sequences of *R. cinnamomea* and so our use of the name, in any sense, is unverified.

For this NZ species the colour, and form (especially when immature) is variable. Pale version this species can be hard to distinguish from *Phaeoclavulina* in the absence of microscopy. Here spores are verrucose, 4.4 x 3.5 µm.

	
JAC 14893/iNat 14759576/ PDD 107109, NI. 4.4 x 3.5 µm.	JAC 14892/iNat 14711774/ PDD 107108, NI
	
JAC 14896/iNat 14635881/ PDD 107112, NI	JAC 15526/iNat 15434248/ PDD 112676, NI
	
JAC 15912/ iNat 28103895/PDD 113059, NI	© C. Shirley, PDD 117836, NI

Ramariopsis JAC13337

Clubs to 6cm, cream becoming pinkish cinnamon. One of the large *Ramariopsis* group.

JAC 13337/ PDD 105590, SI

Ramariopsis sp. 'Manawatu (PDD 107134)'

Clubs to 3cm, deep pinkish grey. It is currently unclear if there are any morphological features which separate this from *R. ramarioides*, or *R. sp. 'Mt Lees'*. Spores not dextrinoid, spiny, 4.3 x 3.7 µm,Q=1.1. Material dried a distinct olive-grey.

JAC 14918/iNat 13416017/ PDD 107134, NI

JAC 17906/ NS5968/ PDD 115016, NI

***Ramariopsis ramarioides* type Waipoua, 5 colls (NI)**

Clubs to 5cm, pinkish cinnamon. This common species can be a relatively robust for a *Ramariopsis*, and often mistaken for a small *Ramaria*. The species in this complex have populations where the colour can be quite uncharacteristically pale. Interestingly JAC14939 shows a distinct green discolouration to the branch tips. For Petersen spores 4.3 x 5.3 µm, Q=1.1

	
JAC 9614/iNat 1370255/ PDD 83734, NI	JAC 14894/iNat 14553384/ PDD 107110, NI
	
JAC 14860/iNat 14067197/ PDD 107076, NI	JAC 10751/JAC PDD 87598, SI
	
JAC 14939/iNat 14375634/ PDD 107154, NI	TENN no. 43524

Ramariopsis JAC17734

Clubs to 2cm, pale cream yellow. I considered the name *R. agglutinata* for this, but I don't feel that I have pinned down that taxon, or separated it from Petersen's description of *R. minutula* cf. Here there is a hint the stipe base is pinkish, c.f. *R. avellanea*.

JAC 17734/ NS5803/ PDD 114844, SI

Ramariopsis JAC14241

Spores and trama wrong for *R. agglutinata*. A very finely branched species with smooth, dextrinoid spores 4.2 x 2.8 µm, probably around 2cm tall. In addition to *R. agglutinata* I would have considered *R. cremicolor* but we have a sequence of the type and it is not the same.

JAC 14241/iNat 3693853/ PDD 106390, NI

***Ramariopsis minutula* cf., type France, 1927, 9 NZ colls (NI/SI)**

	
JAC 14937/iNat 15010140/ PDD 107152, NI	TENN no. 43486

***Ramariopsis* JAC14678**

I would have no hesitation calling this collection *R. longipes* except I found the spores to be smooth and not verrucose. The spores are 2.5 µm diam., weakly dextrinoid and thick-walled.

	
JAC 14678/iNat 7667212/ PDD 106556, NI	

***Ramariopsis avellaneoinversa* type Pelorus, 1 coll (SI)**

Clubs to 3.5cm, stipe grey, branched deep reddish-grey (the colours in the photo are misleading). Type collection sequenced. This name has been used recently for a species in Italy (and eDNA identifications in Wales). The Italian sequence is indeed related, but I would be surprised if the species are identical. Sequence-wise the Italian material differs from the LSU type quite significantly from 800 to 1000 bp, with the sequences showing only a pair-wise similarity of 71%. The proximity of the sequences in the phylogeny is therefore surprising.

TENN 43504 (colour balance issue)

Ramariopsis JAC15523

Clubs to 3.8cm, white bruising fleshy tan.

JAC 15523/iNat 14067165/ PDD 112673, NI

Ramariopsis sp. 'Tarawera (PDD 113549)'

Misapplied? *Ramariopsis novohibernica*

Clubs to 3cm, stipe becoming reddish-pink, branches paler.

JAC 15900/iNat 28761716/ PDD 113047, NI. Spores 4/2.8,Q=1.43	JAC 16405/ NS4138/ PDD 113549, NI

***Ramariopsis bicolor* type not specified, nom. inval., 13 colls. (NI/SI)**

The name R. *bicolor* needs appropriate typification to be validated.

A similar species was collected prior to those shown here and which I decided were *R. bicolor*. However, once these collections were seen it was clear this is the real *R. bicolor*, and it is quite a distinctive species. Clubs to 4cm, stipe pink, branches yellow. There is a closely related species in Australia with sequences deposited as R. *bicolor*, but it is not sufficiently similar for it to be the same (only 93% similarity in ITS).

	
JAC 16428/ NS4161/ PDD 113572, NI	JAC 17719/ NS5787/ PDD 114829, SI
	
TENN no. 42424	

***Ramariopsis avellanea* type Waipoua, 2 colls (NI)**

Note the colour 'avellaneous' (Ridgeway Plat XL) is equated to Kornerup & Wanscher 7B3 which is a reddish grey. Petersen described the species with pale tips and purplish to avellaneous stipe.

Clubs to 2.5cm, stipe golden yellow, becoming red-grey, branches staying yellow, later red-grey. *R. bicolor* and *R. avellanea* are both described with a similar two-tone fruitbody (hysterorochroic) with the lower stipes becoming pinkish and the colour change spreading upwards with age. However, *R. bicolor* is described with spores smooth, 2.5-3.2 x 2.2-2.9 µm, and *R. avellanea* with prickly spores 3.6-4.3 x 2.9-3.2 µm. The spores here are minutely verrucose 3.5 x 3 µm.

	
JAC 17864/ NS5926/ PDD 114974, SI	JAC 15736/iNat 26070975/ PDD 112884, NI
	
JAC 14865/iNat 13570190/ PDD 101408, NI	JAC 15446/iNat 13674925/ PDD 112596, NI
	
JAC 15807/iNat 27710278/ PDD 112954, NI	TENN 43497. Colour balance issue

***Ramariopsis junquilea*, type Urewera, 8 colls. (NI/SI)**

Clubs to 2.3cm, stipe & branches yellow. Type collection sequenced.

?

***Ramariopsis junquillea* aff.**

Clubs to 3cm, orange. This has very small spores, 2.7 µm, globose, thick-walled and dextrinoid.

JAC14644/iNat6865895/PDD 106523, NI

***Ramariopsis cremicolor*, type Urewera, 6 colls. (NI)**

Clubs to 3cm, stipe cream to tan, branches white to cream. Type collection sequenced.

TENN no. 43457

Ramariopsis sp. 'Orokonui (PDD 87596)'

Misapplied *Ramariopsis crocea*, type Europe, 4 NZ colls. (NI/SI)

Ramariopsis crocea is a northern hemisphere species with a sequenced epitype. Our species is related but is not the same. It is generally under 1cm tall and much smaller than *R.crocea*. Note this species sometimes grows on woody debris.

JAC 13920/ PDD 106123, NI

JAC 17697/ NS5765/ PDD 114808, SI

JAC 10749/ PDD 87596, SI

JAC 14871/iNat 13891824/ PDD 107087, NI

Missing species in *Ramariopsis*

	
Ramariopsis alutacea TENN no. 43470, type Waipoua, 5 colls (NI/SI). Clubs to 3cm, fleshy tan. Potentially *Clavulinopsis* subg. *Donkella*, spores large, 6.2 x 5.5, smooth	*R. sp. 1*, 1 coll, Omahuta (NI). Clubs to 2.5cm, olive (Photo issue).
	
R. sp. 4, TENN 43524. 1 coll, Waipoua (NI). Clubs to 3.8cm, cream	*R. sp. 5,* 2 colls, NI. Clubs to 3.5cm, orange apricot (=*R. crocea*).
	
Ramariopsis cinnamomea cf., type Australia, Vic. 1938, TENN 43472. 5 NZ colls. (NI/SI). Clubs to 3cm, yellowish tan.	*Ramariopsis novohibernica,* type Papua New Guinea, TENN no. 43474, 4 NZ colls (NI). Clubs to 3cm, stipe brown, branches paler. See *R. sp. 'Tarawera'*

	No photo
Ramariopsis longipes TENN no. 43495, type Pelorus, 2 colls (NI/SI). Clubs to 4.5cm, cream	*R. sp. 2*, 2 colls, Urewera (NI). Clubs to 3cm. yellow-green.
No photo	No photo
Ramariopsis sp. 3, 3 colls (NI/SI). Clubs to 3.cm lavender.	*Ramariopsis tortuosa*, type Waipoua, 1 coll (NI). Clubs to 2cm, white to tan.
No photo	
Ramariopsis agglutinata, type Urewera, 3 Colls. (NI). Clubs to 2cm, ivory to dull yellow. See JAC17734.	

Table 1. Key characters for the yellow(ish) non-sulcate *Clavulinopsis* species

	Petersen spores	Measured spores	colour	Fasciculate(f) Gregarious (g)	Club size to (cm)	furcations	terete
'Manawatu'		3.4x3.4,Q=1	Golden yellow	f	4	y	+-broad
'Rotoatua'		6x6, Q=1	Lemon yellow	g	2	n	no
'Okataina' =luteotenerrima	6x4.2,Q=1.4	4.3/2.6, Q=1.63	Lemon yellow	f/g	6	n	narrow
'Fern Walk'		6.1x4.8,Q=1.27/6.3x4.5,Q=1.38	Pale lemon yellow	f	5.5	n	no
simplex		5.2x5.3,Q=1.03/3.8x3.1,Q=1.25	Lemon yellow	g	6	y	no
'Lottery Bush' =laeticolor	7x5.1,Q=1.43	6x4.5, Q=1.32	Orange-red	g	6	n	+-broad
archeri	5.5x5.5, Q=1	5-5.5 subglobose	Pallid yellow orange	f/g	3	y	+-broad
amoena	6.5x4.25,Q=1.5	?	Bright yellow	g	5	n	no
'Murphys Bush'=spiralis NZ	6.5x5.8,Q=1.01	4x5.1,Q=1.01	Yellow, yellow orange, ochraceous buff	g	7	n	narrow
antillarum	5.3x4.7,Q=1.1	4.5-6 globose	Bright clear yellow	f/g	6	n	narrow
depokensis	5.8x4.4,Q=1.32	6.8x4.9,Q=1.42/6.8x4.8,Q=1.44/6.3x4.6,Q=1.4	Bright orange	g	7	n	narrow
ovispora	6.7x5.5,Q=1.22	?	Brilliant orange becoming golden yellow	f	8	y	broad

Table 2. Key characters for the drab (initially), small *Ramariopsis* species

	Petersen spores	**Stipe colour**	**Branch colour**	**Club height cm**	**Branches terrete**	**Spores dextrinoid**	**distinctions**
agglutinata	3.2x2.2, smooth	Pale pink to yellow	Ivory	2	n	n	Trama hyphae glued together.
longipes	3.7x2.7, rough	Creamy yellow	Ivory	4.5	y	y	Long stipe
avellaneoinversa	4.4x2.2, rough	White to dull grey	Red-grey	3.5	n	n	Relatively fleshy
novohibernica	3.3x3, rough	brown	Paler to apex	3	n	?	
avellanea	4.0x3.1, minutely rough	Red-grey	Pale pinkish cinnamon	3	y	y	Darkens to nearly purple/pulchella-like
bicolor	2.7x2.5, smooth	Yellow becoming red-grey	Yellow becoming red-grey	2.5	n	y	Colour changing from base to top with age
tortuosa	3.8x2.8, smooth	White to tan	White	2	n	n	Gnarled twisted branches
cremicolor	3.8x2.8, smooth	White to tan	White to pale tan/pink	3	n	y	Like agglutinata but branch tips pointed
***minutula cf*.**	3.4x2.7, smooth	Pure white	White becoming cream	2	n	y	
Sp. 4	4.0x3.0, minutely rough	white	Fleshy tan	3.8	y	?	Branches terete
'Tarawera'	4x2.8, rough	Tan	Cream	4	n	y	
JAC17734	3.9x3.1, smooth	Cream to pink	Cream to pale yellow	3	n	Y	
JAC14241	4.2x2.8, smooth	Cream/yellow	Cream/yellow	2?	n	y	
JAC15523	4.2x3.3	Tan	Tan	2	n	y	
JAC14678	3.6x3, smooth	Pinkish tan	Cream	4	n	y	

Hodophilus

Type species *Hodophilus foetens*, UK, 1878

The genus consists of rather small wax-cap like mushroom, generally with a strong odour of mothballs (naptha). They are distinguished by possessing a hymeniderm pileipellis and no clamp connections on the hyphae.

Hodophilus JAC15054

About 2.5cm tall, usual naptha odour.

JAC15054/iNat13543246/PDD 107269

Hodophilus JAC16429

To 6cm tall, no odour.

JAC16429/NS4162/PDD 113573

Hodophilus JAC14666

About 2cm tall, odour unknown

JAC/14666/iNat7019435/PDD 106544

Hodophilus roseolus

To 3cm tall, naptha odours variable, surface finely frosted.

JAC9961/PDD 87064

JAC17956/NS6018/PDD 115066

Hodophilus sp. 'Aongatete (PDD 106327)'

To 2cm tall, naptha odour.

JAC14165/iNat3573458/PDD 106327

Hodophilus sp. 'Hauru Falls (PDD 83737)'

To 3cm tall, odour not noted, blackens on drying.

JAC9618/PDD 83737

JAC15057/iNat13415669/PDD 107272

Hodophilus sp. 'Howick (PDD 107270)'

To 3cm tall, stipe with scales, naptha odour.

	
JAC15053/iNat13766124/PDD 107268	JAC15055/iNat14004899/PDD 107270

Camarophyllopsis

Type species *Camarophyllopsis schulzeri*, Italy, 1884

Another wax-cap like genus without a hymeniderm pilepellis.

Camarophyllopsis aff.JAC17723

To 3cm tall, viscid, no odour. This is sufficiently different to *Camarophyllopsis* to deserve a new genus.

JAC17723/NS5792/PDD 114833

Camarophyllopsis JAC15735

To 3cm tall, odour not noted. Found in a lawn and possibly introduced.

JAC15735/iNat25927511/PDD 112883

Camarophyllopsis furfuracea

Horak described this in the genus *Aeruginospora*.

JAC14651/iNat6878137/PDD 106530

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