Studies on New Zealand Clavariaceae. I.

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[*Communicated by Professor H. D. Gordon and read before the Wellington Branch, April 28, 1954; received by Editor, April 26, 1954.*]

Summary

The following genera are discussed:—*Aphelaria*, *Tremellodendropsis* stat. nov., *Tumidapexus* gen. nov., *Lentaria* and *Clavariadelphus*. *Aphelaria* subgenus *Tremellodendropsis* Corner is raised to generic rank and enlarged to include two subgenera, *Tremellodendropsis* and *Transeptia*. *Tremellodendropsis* subgenus *Tremellodendropsis* includes *T. tuberosa* (type), *T. pusio*, and *T. flagelliformis* (after Corner). *Aphelaria tasmanica* (Lloyd) Corner 1950, is considered as *T. flagelliformis* var. *tasmanica*, and a new variety *T. flagelliformis* var. *ovalispora* is also described. The new subgenus *Transeptia*, for the alliance with transverse septa across the young sub-tremellaceous basidia, contains the new species *T. transpusio* with two new varieties var. *minor* and var. *inflata*.

The new genus *Tumidapexus* consists of only one species *T. ravus* spec. nov., which differs from other members of the family in having the apices of the branches swollen and irregularly thickened. Basidia and hyphal structure are definitely clavarioid.

Lentaria sunculus is recorded for New Zealand.

The genus *Clavariadelphus* is represented in the Southern Hemisphere only by *C. junceus*, a white colourless form being found in New Zealand and Australia.

Introduction

The present paper is the first of a series dealing with a collection of New Zealand Clavariaceae. The genera dealt with here are not some of the more typical members but rather those whose taxonomic position called for elucidation. Both fresh and dried material was examined as well as material fixed in formalin-acetic-alcohol and preserved in 70% alcohol and glycerine solution. Spore and other measurements were made either from fresh material mounted in water or later from fixed material mounted in lacto-phenol-cotton blue. More recently these have been checked against measurements made from mounts in 5% aqueous caustic potash, to conform with the practice of other workers.

Aphelaria Corner.

A study of New Zealand specimens apparently belonging to the genus *Aphelaria* Corner (1950, p. 180), leads to the conclusion that they form a sufficiently distinct entity to be regarded as a separate genus. Corner (1953, pp. 347–348), recognised a subgenus *Tremellodendropsis* for those species with clamped hyphae, and sub-tremellaceous basidia. This subgenus is here raised to the status of a genus and its concept enlarged to include a new subgenus *Transeptia*. No known New Zealand species then remain in the genus *Aphelaria*.

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Vol. 82, Part 3, pp. 617–631, Plate 23, 6 Text-figs., November, 1954

TREMELLODENDROPSIS (Corner) stat. nov. emend.

Fruit body clavarioid, branched, rarely subsimple, branches terete to flattened, polychotomous to dichotomous, rugose to smooth, subcoriaceous to tough and fleshy, possessing a high percentage of water yet not really gelatinous, colour when fresh varying from white to dull pallid to flesh colour or deep buff; drying horny or cartilaginous, twisted, fuscous to grey colour; macroscopically very similar to *Aphelaria.*

Terrestrial, on hard clay to rich humus: 4 spp., north and south temperate and tropical: type *T. tuberosa.*

Spores white, smooth walled, subglobose, oblong, ovoid amygdaliform, aguttate or minutely multi-guttulate.

Basidia clavate, large, apex cruciately subseptate or septate: sterigmata 1–2–4, elongated.

Hymenium generally thickening, absent from stem and parts of upper sides of some branches or rudimentary. Cystidia absent.

Hyphae monomitic, clamped, occasionally secondarily septate, not inflated, cells elongated, walls thickening.

KEY TO *Aphelaria* AND *Tremellodendropsis*

Basidia clavate; hyphae without clamps, walls slightly thickened, not inflated	*Aphelaria*
Basidia clavate, apex partially or wholly cruciately septate; hyphae clamped	*Tremellodendropsis*
Apex of basidium cruciately subseptate	subgen. *Tremellodendropsis*
Apex of basidium cut off by a transverse septum when young, then becoming cruciately septate	subgen *Transeptia*

Subgenus TRANSEPTIA subgen. nov.

Basidiis ad apicem septo transverso divisio, parte apicali dein longitudinaliter et cruciatim septata.

TYPUS: *Tremellodendropsis transpusio.*

Some authors would probably place *Tremellodendropsis* in the Tremellaceae, regarding the partial or complete septation of the apical region of the basidium as anomalous for the Clavariaceae; the subgenus *Transeptia* might even be placed in the Auriculariaceae because of the transverse septation. However, transverse septation of old basidia occurs not only in members of the subgenus *Tremellodendropsis* but also in other members of the Clavariaceae—e.g., *Clavulina.* It is therefore not unreasonable to suppose that the time of septation occurs earlier in the young basidia of subgenus *Transeptia.* The members of the genera *Aphelaria* and *Tremellodendropsis* form a sequence from the nonseptate elongate clavate basidium, through the still elongate clavate but partially septate basidium, to the " Transeptia " basidium where the apical portion is cut off by a transverse septum to give a cruciately septate region. All these basidia differ from the typical Tremellaceous basidia in still being clavate, not globular. The genus *Tremellodendropsis* provides a link between the Clavariaceae, Tremellaceae and Auriculariaceae.

KEY TO THE SPECIES OF *Tremellodendropsis*

Subgenus TREMELLODENDROPSIS
- Basidia cruciately subseptate at apex.
  - Spores elongate, mostly twice as long as broad.
    - sp. 12–20 x 5–9μ, ellipsoid-amygdaliform .. 1. *T. tuberosa*
    - sp. 9–16 x 4.5–7μ, mostly oblong-ellipsoid .. 2. *T. pusio*
  - Spores broadly-oblong, ovoid to subglobose.
    - sp. 7–11 x 5–7μ, mostly broadly-oblong .. 3. *T flagelliformis*
    - sp. 8–12.5 x (6–) 7–9μ, mostly broadly-ovoid to subglobose .. *T. flagelliformis* var. *ovalispora.*
    - sp. (10–) 12–15 x 6–9μ, mostly broadly-oblong . *T. flagelliformis* var. *tasmanica*

Subgenus TRANSEPTIA
- Basidia with a transverse septum cutting off a cruciately septate apical region, before spore formation
  - Spores elongate, subcylindrical to subsigmoid.
    - sp. 9–15 x 4–7μ, fruit body white .. 4. *T. transpusio*
    - sp. 8–13 x 4–7μ, fruit body pink-buff .. *T. transpusio* var. *minor*
  - Spores broader.
    - sp. 10–14 x (6–) 7–9μ .. *T. transpusio* var. *inflata*

Delimitation of species of *Tremellodendropsis* is difficult; morphologically they are all very similar, both in the fresh state and even more so when dried. Differences in size, length of stalk, degree of flattening of branches, and compactness of plant have been observed, but the growth form is most probably dependent on environmental conditions. In the related genus *Aphelaria* a similar wide range of growth forms has been recorded for *A. dendroides*. Spore size is usually regarded as a fairly constant character, but if the basidia produce from one to four spores a wide range in spore size from any one plant might be expected.

Subgenus TREMELLODENDROPSIS

1. **Tremellodendropsis tuberosa** (Grev.) comb. nov.

Basonym: *Merisma tuberosum* Grev. 1825, t. 178.

Synonyms: *Aphelaria tuberosa* (Grev.) Corner 1950, p. 192 (see also for other synonyms and description) and 1953, p. 352.

DISTRIBUTION: North Temperate, South Brazil, Borneo. No New Zealand specimens recorded.

Spores are given as (12–) 14–20 (–24) x (4–) 5–7 (–9μ), white, smooth, elongate ellipsoid, amygdaliform, subfusoid or subcylindrical. The lower limits of this spore range overlap with those of *T. flagelliformis* var. *tasmanica* but they can be separated on spore shape; those of the latter are more oblong and bluntly rounded, not tapered to a subacute apex or amygdaliform as are those of *T. tuberosa.*

(Corner has examined Borneo specimens and described them [private communication] as follows: Bt. Moeloe, Hans Winkler no. 570, 2:11:24 Herb. Hort. Bot. Bog. 3071: –5 cm. high caespitose, multifid below, becoming dichotomous above with elongate flagelliform tips; stem 2–3 mm. thick below; terrestrial: spores 12–14·5 x 7–8 5μ amygdaliform, subacute, the walls slightly but distinctly thickened, apicule 1μ: hymenium collapsed: hyphae 2–4μ wide, walls slightly thickened, clamped, monomitic.

Also Lianygagong, Herb. Hort. Bot. Bog. 5247: spores 13–16·5 x 7–9μ amygdaliform.

These should be included in *T. tuberosa,* because although slightly smaller in size, they have the distinct amygdaliform shape.)

2. **Tremellodendropsis pusio** (Berk.) comb. nov.

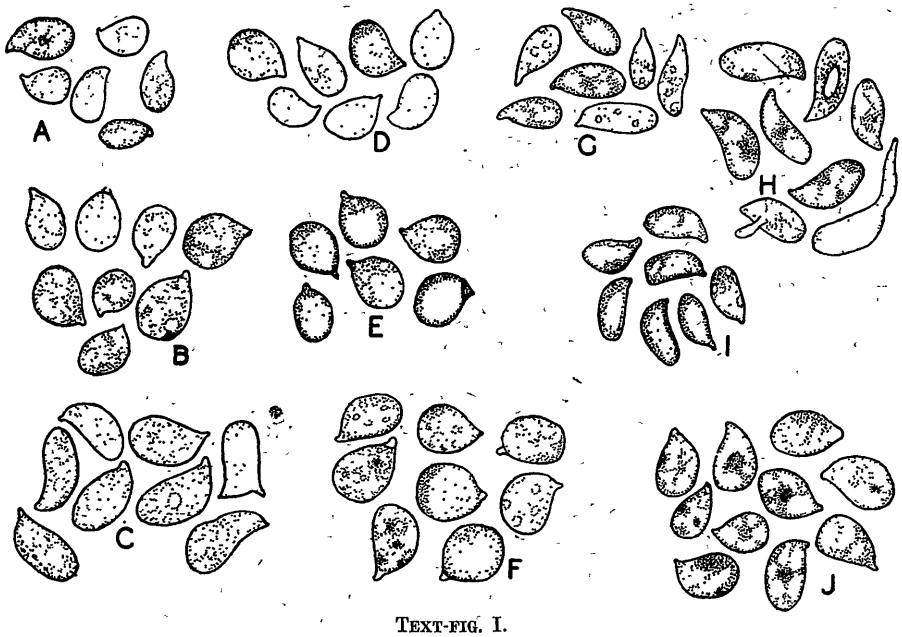
Text-fig. 1, G.

Basonym: *Clavaria pusio* Berkeley in Hooker 1855, p. 185; Hooker 1867, p. 614; Massee 1906, p. 40.

Synonym: *Aphelaria pusio* (Berk.) Corner 1950, p. 188 and 1953, p. 350.

TYPE COLLECTION: Kew Herbarium under *Clavaria pusio*, specimens collected by Colenso, North Is., New Zealand.

DISTRIBUTION: New Zealand; New South Wales, Australia; Madagascar; Brazil.



TEXT-FIG. I.

Spores of *Tremellodendropsis* species.

A. *T. flagelliformis* . . . type. B. *T. flagelliformis* var. *ovalispora* . . . type. C. *T. flagelliformis* var *tasmanica* . . . cotype. D. *T. flagelliformis* . . . No. 206. E. & F. *T. flagelliformis* var. *ovalispora* . . . Nos. 240 and 49 respectively. G. *T. pusio* . . . type. H. *T. transpusio* . . . type. I. *T. transpusio* var. *minor* . . . type. J. *T. transpusio* var. *inflata* . . . type. Magnification × 750.

The original specimens are small plants, –2 cm. in height, once or rarely twice branched, axils acute, tips tapering-acute; colour of dry plants rufous. Specimens from Australia and Brazil (Corner 1953, 350–351) have much larger fruit bodies –7 cm. high, fastigiate, divided several times, with the final dichotomy giving rise to long slender tapered tips.

Spores 9·5–16 x 4·5–7μ, smooth, oblong-ellipsoid, obtuse or subacute.

Hymenium mostly collapsed in type, in Whitelegg's Australian collection basidia 45–70μ long x 12–13μ wide tapered to a narrow base, cruciately subseptate at apex; sterigmata 4, 10–14μ long: hyphae prominently clamped, monomitic, not inflated, 2–5μ wide.

The only recent material collected in New Zealand with spores and fruit bodies similar to *T. pusio* was found to have a transverse septum across the apical region of the basidium as well as the longitudinal septation. Owing to the collapsed

nature of the hymenium in the type of *T. pusio* it was impossible to ascertain the true nature of its basidia. Specimens with a transverse septum across the apical region of the basidium before spore formation are therefore separated into a new species *T. transpusio*.

3. **Tremellodendropsis flagelliformis** (Berk.) comb. nov.

Text-fig. 1, A and D

Basonym: *Clavaria flagelliformis* Berkeley in Hooker, 1855, p. 186; Hooker 1867, p. 614.
Synonyms: *Aphelaria flagelliformis* (Berk.) Corner 1953, p. 350; *Lachnocladium flagelliforme* (Berk.) Cooke 1892, p. 179.

TYPE COLLECTION: Kew Herbarium, under *Lachnocladium flagelliforme*, Bay of Islands, New Zealand.

DISTRIBUTION: Bay of Islands, and Wellington, New Zealand, also Brazil and Sumatra (Corner, 1953, p. 350).

Fruit body –6 cm. high, caespitose to solitary, flesh dull pink-fawn, basal region whitish, tough when fresh, drying horny fuscous with paler tips: branching polychotomous and expanded at first, finally dichotomous; branches often terete, especially the ultimates which are subparallel and taper to fine pointed tips, or in some shorter stouter plants flattened with more rounded, blunter tips.

Spores 7–11 x 5–7 (–7·7) μ, white, smooth, thin walled with granular contents, bluntly ellipsoid to lachrymiform; apicule subterminal –1·6 μ.

Basidia 1, 2 or 4 spored, 60–95 μ long x 10–11 μ wide, tapering to 3–4 μ at base, cruciately subseptate, septa extending 4–9 μ down into basidia, clamped at base: sterigmata 6–14 μ long x 2·5 μ, tapered, erect with a slight outward curvature. Some sterigmata elongate, forming hypha-like projections 1·7 μ wide, with rounded ends. (In specimen No. 114 some old basidia up to 94 μ long, embedded in the thickening hymenium, had become once or twice septate; c.f. some *Clavulina* species. No young basidia were septate.)

Hymenium thickening –95 μ, composed of mature basidia and narrow unexpanded hyphal ends mostly derived from the elongation of old sterigmata; absent from base of the stem.

Hyphae 2·5–3·5 μ wide, monomitic, not inflated, clamped, walls slightly thickened.

The above description is based on the type and on collection Nos. 105 and 114, from Keith George Memorial Park, Wellington, and No. 206, Waikaremoana, Nth. Is., New Zealand. From the description of specimens from Brazil and Sumatra (Corner 1953, p. 350) it is probable they are specimens of *T. flagelliformis*, but without detail of basidia one cannot be absolutely certain.

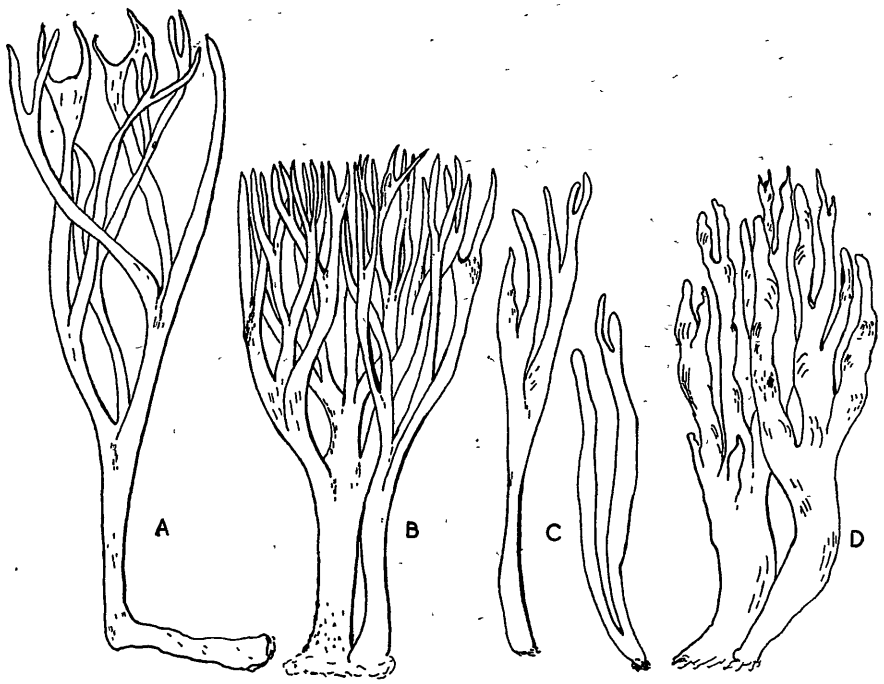
Tremellodendropsis flagelliformis var. **ovalispora** var. nov.

Text-figs. 1, B, E and F, and 2.

Receptacula coloris punicea-carnea cum crescunt, solitaria vel subcaespitosa, ramosa cylindrica et attenuata, vel planata vel rugosa: sporis albis lato-ovoideis vel subglobosis obtuse curvatis levibus, 8–12 x (6–) 7–9 μ, apiculis 1–2 μ longis, subterminalibus, aguttatis vel minute guttulatis: basidiis clavatis, cruciatim subseptatis, 1–2–4 sporatis; sterigmatibus magnis: hyphis fibuligeris, 2–4 μ latis, plus minus crasse tunicatis.

TYPE: Quoin Ridge, Tararua Ranges, Wellington, New Zealand, No. 157.

DISTRIBUTION: Wellington and Nelson districts, New Zealand.



TEXT-FIG. II.

Tremellodendropsis flagelliformis var. *ovalispora*.

A. & B. Type collection (No. 157). B. Type plant. C. Subsimple plants (No. 240). D. Young rugose plants (No. 165). Magnification × 1.

Fruit body –6 cm. high, gregarious or caespitose: branching copious to limited, polychotomous at first, later dichotomous; branches slightly flattened, finally terete, tips sharply pointed to bluntly rounded; stem pronounced or divided from subtuberous base: colour dull pinkish-buff, cream-buff or pinkish cinnamon when fresh: flesh tough almost coriaceous, not gelatinous but with a high water content; drying horny, twisted, tips brown translucent, branches cream ochraceous to grey-brown, stem lighter in colour.

Like *Aphelaria dendroides* there appears to be a wide range in growth form; from the " Pterula form " with slender, smooth, elongate, cylindrical fastigiate branches, with stem approximately half total height; to the " Thelephora form " with flattened irregular branching almost palmate in some cases, flesh rugose, stem not prominent. In the type collection localized thickening of the hymenium gave rise to swellings often just before branches divide, especially towards the ultimates (c.f. also var. *tasmanica*).

Stem generally distinct, often striate, basal portion whitish, slightly hairy due to strands of mycelium and projecting hyphae; often arising from a subtuberous mass buried in litter or soil; several stems may arise from the same buried base.

Branches terete, rugose or more or less flattened; some plants are branched 2–3 times with branches either elongated or short and rugose; others are branched 4–5 times and form a more dendroid or fastigiate structure, with elongated tips tapering to 1 mm. or less in width; in active growth tips may have a colourless hairy appearance due to projecting hyphal ends.

Spores 7·5–12 (–13) x 6–9μ, shorter than var. *tasmanica* and broader than *T. flagelliformis;* white to hyaline en masse, yellowish in dilute potassium hydroxide; aguttate to wholly granular guttulate; walls smooth and fairly thin; shape varying from subcylindrical to subglobose; apicule usually prominent, 0·8–2μ long, subterminal.

Basidia clavate, 8–13μ wide x 50–95μ long, tapering to a narrow clamped base; cruciately subseptate with length of septa varying from 0–15μ down into basidia, 1–2–4 spored: sterigmata stout, elongate, –14μ long, erect to slightly outwardly curved; solitary sterigmata may be as much as 18μ long, while other abortive or old sterigmata elongate to form fine hair like hyphae in the hymenium layer. Old basidia may become secondarily septate. Cystidia none.

Hyphae monomitic, not inflated, clamped, 2–4μ wide, walls thickened 0·8μ–1·5μ. Cells elongated in medullary region, less so in subhymenium. Clamps may be small or large, sometimes swollen or elongated; secondary septa without clamps also present.

Collections included in this variety are Nos. 157 Quoin Ridge, Tararua Range, Wellington (type); 114A, 165, 240, 334, Keith George Memorial Park, Wellington; 49, Haywards, Wellington; 305, Maitai Valley, Nelson. (See Table I). Nos. 49 and 334 with slightly longer spores than the rest form a link with *Aphelaria tasmanica* which is here considered as *T. flagelliformis* var. *tasmanica.* Corner (1953, p. 351), included No. 49 (= Warcup C 49) in *Aphelaria tasmanica.* However, when considered in relation to the whole range it seems best to restrict var. *tasmanica* to the Tasmanian specimens with longer spores and a higher length to width ratio, and place Nos. 49 and 334 under var. *ovalispora.*

Tremellodendropsis flagelliformis var. **tasmanica** (Lloyd) stat. nov.

Text-fig. 1, C.

Basonym: *Pterula tasmanica* Lloyd 1923, 1227, f. 2539.

Synonym: *Aphelaria tasmanica* (Lloyd) Corner 1950, p. 191, and 1953, p. 351.

TYPE: Lloyd Cat. No. 32715; Cotype Rodway Herbarium, University of Tasmania (leg. Rodway, Mt. Field, Tasmania, Aug., 1922).

TABLE I

Spore Range in *T. flagelliformis* and Varieties

Specimen	Range	Average	No. Averaged	E*	
Type	8–11 x 5–7μ				
No. 105	7–10 x 5–7μ	8.4 x 6μ	25	1.4	*T. flagelliformis*
No. 114	7–10 x 5–7.7μ	9 x 6.5μ	25	1.38	
No. 206	7.7–11 x 6–8μ	9.9 x 6.8μ	20	1.45	
No. 157	8.5–12.6 x 6–9μ	9.9 x 7.8μ	50	1.26	Type
No. 165	8.5–11 x 7–8.5μ	9.3 x 7.3μ	25	1.28	
No. 114A	7.5–12 x 5–8.5μ	9.6 x 7.5μ	40	1.28	
No. 240	7.2–10.5 x 6–8.4μ	9.5 x 7.6μ	20	1.25	var. *ovalispora*
No. 305	8–10.5 x 6–9μ	9.6 x 7.5μ	20	1.28	
No. 49	9–12.5 x 6.5–9μ	10.5 x 7.5μ	20	1.4	
No. 334	7.7–13.7 x 6–9μ	10.3 x 7.5μ	25	1.37	
Cotype var. *tasmanica* Rodway Hobart, July, 1924	12–17 x 6–9.4μ	13.6 x 7.7μ	15	1.76	var. *tasmanica*
	10–14 x 6–9μ	11.9 x 6.8μ	20	1.75	

* E = average length divided by width.

DISTRIBUTION: On the ground, Mt. Field and Hobart, Tasmania. No New Zealand specimens.

Morphologically and anatomically this variety is difficult to separate from some specimens of the former variety. In the cotype material localized swellings on or just before the ultimate branches were observed. Spores, however, are in general longer (10–) 12–17 x 6–9·5μ. Spores from both Tasmanian collections (see Table I) on an average had a decidedly larger ratio of length to width (E = 1·75).

From Table I it will be seen that although three groups can be separated on the basis of spore size, these groups are not sufficiently clear cut to give them specific rank. As more collections are made it may be shown that the intergrading is such as to prevent even varietal distinction.

Subgenus TRANSEPTIA subgen. nov.

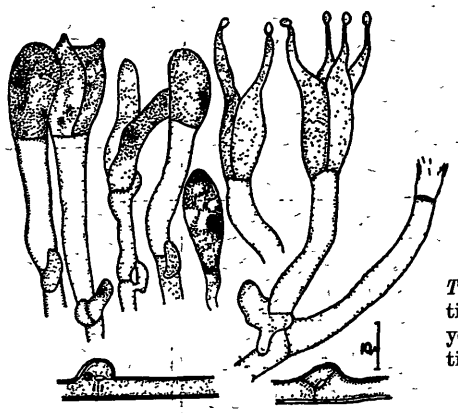
4. **Tremellodendropsis transpusio** spec. nov.

Text-figs. 1, H, and 3. Plate 23, A.

Receptacula parva alba vel cremea cum crescunt, aetate brunneola vel sub cremea, ramosa dendroidea, ramulis attenuatis: sporis 9–15·5 x 5–7μ hyalinis vel albis, levibus, oblongo-cylindricis, apicibus obtuse curvatis vel attenuatis; basidiis 2–4 sporatis, ad apicem septo transverso divisio, parte apicali dein longitudinaliter et cruciatim septate quaque parto gignente magnum erectum sterigma: hyphis haud inflatis, 2·5–4μ latis, fibulis, crasse tunicatis.

TYPE: No. 242, Keith George Memorial Park, Wellington, New Zealand, Junius, 1949, ad terram sub *Beilschmeidia tawa*.

DISTRIBUTION: Wellington District and Maitai Valley, Nelson (No. 310, July, 1949), New Zealand.



TEXT-FIG. III.

Tremellodendropsis transpusio . . . type collection. Basidia showing transverse septation of young basidia, followed by longitudinal septation and sterigmata formation; hyphae showing clamps and slightly thickened wall.

Plants –2·5 cm., colour off-white to ivory yellow, flesh tough, subgelatinous when fresh, drying rapidly to a horny brittle structure, pale fuscous to creamy fawn; solitary or gregarious, arising from a small round patch of mycelium on the bare clay soil; stem variable –0·5 cm. x 1 mm. at base, expanding before branching, sometimes quite flattened: branched 2–4 times, polychomotously at first, with a final dichotomy; lax dendroid habit with tips tapering to a fine point, hyphal ends giving a slight hairy appearance to tips.

Spores 9–15·5 x 5–7μ, white, smooth walled, granular, contents aguttate to once or twice guttulate, oblong-cylindrical to slightly sigmoid-oblong, apex obtusely rounded or tapered, apiculus prominent. Germinating spores present with germ tubes developed –20μ long.

Basidia (2–) 4 spored, 30–60μ long x 8–10μ wide; a transverse septum cuts off the apex of the young basidium –20μ back; the protoplasm is usually congregated in this region leaving the long stalk portion empty; longitudinal septation then follows, starting at the apex and extending down to the transverse septum to give a cruciately divided apex, each cell of which produces a well developed sharply pointed, erect but slightly spreading sterigmata 7–10μ long. Several anomalous basidia were found in which only one abortive sterigma was produced. Examples of basidial proliferation through clamp formation, somewhat similar to those described by Rogers for *Sebacina* (Mycologica 28, 1936, 347–362), were also found, but were not common. Branches extend from the clamp to form one celled sterigmatal units.

Hyphae monomitic, 2·5–4μ wide, clamped, walls thickened 0·4–0·8μ, not inflated.

Tremellodendropsis transpusio var. **minor** var. nov.

Text-fig. 1, I.

Receptacula –2 cm., alta, carnea vel puniceo-brunneola aetate brunnea vel pallide ochracea, extremis vitreis; ramis furcatis bis vel ter: sporis 8–12·5 x 4·5–6·5μ albis, levibus oblongis, apiculis subterminalibus: basidiis et hyphis sicut in *T. transpusio*.

TYPE: No. 241 Keith George Memorial Park, Wellington, New Zealand. Junius, 1949, ad terram.

DISTRIBUTION: Wellington District and Levin (No. 258 leg. Dr. G. Cone, June, 1949).

Fruit body –2 cm. high, flesh coloured or dull pale pinkish-brown when fresh; on drying tips translucent, grading into brown ultimates, main branches and stem cream to grey; branched 1–4 times; stem –8 mm. wide, rounded or flattened, expanding before branching, multifid at first, finally bifid, some plants subsimple, ultimately tapering to fine pointed tips with loose hyphal ends giving a hairy appearance when in active growth.

Spores 8–12 x 4·5–6 5μ, white, smooth walled, oblong, with a subterminal apiculus.

Basidia as for *T. transpusio* 1–2–4 spored.

Hyphae as for *T. transpusio*.

Differs from *T. transpusio* in pinkish colour of fresh fruit body, and in the shorter spores.

Tremellodendropsis transpusio var. **inflata** var. nov.

Text-fig. 1, J.

Receptacula –1·5 cm., alta, solitaria vel caespitulosa, pallido-roseo-ochracea, carne rugosa lenta; subsimplicia vel furcata semel bis ter, ramis cylindricis vel paulum attenuatis; terrestria: sporis 10–13·5 x 6–8μ, albis levibus, granulis praeditis: basidis et hyphis sicut in *T. transpusio*.

TYPE: No. 322 Rai Valley, Nelson, New Zealand, Julius, 1949.

DISTRIBUTION: Nelson District, New Zealand.

Fruit body –1·5 cm. high, solitary to caespitose, dull pinkish-buff, slightly rugose, subsimple to irregularly branched 1–3 times, cylindrical to slightly flattened, tips tapering or rounded, spreading. On the ground under *Nothofagus truncata.*

Spores 10–13·3 x 6–8μ, smooth walled, contents granular, vacuolated.

Basidia and hyphae as for *T. transpusio.*

Differs from *T. transpusio* in the smaller pink fruit body and wider spores (see Table II).

TABLE II

Spore Range in *T. transpusio* and Varieties

Specimen	Range	Average	No. Averaged	E*	
No. 242	11.2–15.3 x 4.2–6.3μ	13.1 x 5.4μ	50	2.4	Type *T. transpusio*
No. 310	10.5–15 x 4.9–7μ	13.4 x 5.5μ	15	2.4	„
No. 241	9.1–12.6 x 4.2–6.3μ	9.8 x 5.3μ	15	1.85	Type var. *minor*
No. 258	9–11.9 x 4.5–6μ	10.6 x 5.1μ	30	2.07	„
No. 322	9.8–13.3 x 5.6–8.4μ	11.8 x 7.1μ	25	1.66	Type var. *inflata*

* E = Average length divided by width.

TUMIDAPEXUS gen. nov.

Receptacula ramosa, apicibus obtusis inflatis, clavatis dein irregulariter noduloso-tuberculatis vel strobiliformibus: hymenio trunco ramisque inferioribus deficiente: sporae albae, minutae, lacrymiformes: basidia tetrasporifera, attenuata, clavata: hyphae fibulatae haud inflatae, plus minus crasse tunicatae: ad terram. Wellington, Novae Zealandeae, 1 sp., typus *T. ravus* sp. nov.

Fruit body branched, tips blunt, rounded and swollen; growth in swollen region irregular giving rise to slight projections which are at first knob-like, later more extended; stalk distinct; hymenium lacking from stalk and lowest part of branches, but amphigenous on upper parts of branches and swollen apices: spores white, drop-shaped, very small: basidia 4 spored, slender clavate: hyphae monomitic, clamped, not inflated, walls slightly thickened. Growing on soil Wellington, New Zealand: one species.

Tumidapexus ravus sp. nov.

Text-fig. 4. Plate 23, B.

Receptacula ad 3·5 cm. alta, solitaria, ravo-alba, ter vel quater divisa, primum trichotoma denique dichotoma, ramis levibus ravo-brunneolis: trunco distincto paulo brunneolo: apices inflati et impariter incrassati: sporae albae 3–5 x 2·5–4μ: basidia tetrasporifera, attenuata et clavata: hyphae fibulatae 2–6μ latae: ad terram nudam, Wellington, Novae Zealandeae.

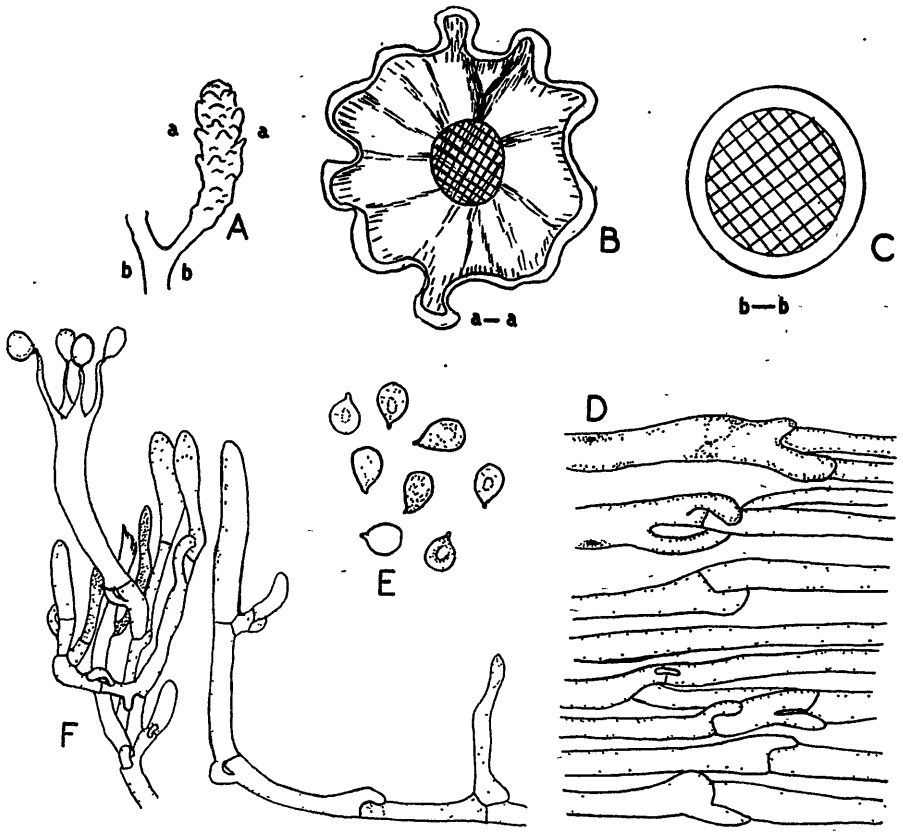
Fruit body –3·5 cm. high, solitary, greyish-white: branched 3 to 4 times, at first trichotomously finally dichotomously; branches smooth, grey-brown, cylindrical; stalk distinct, tinged with brown; apices swollen and irregularly thickened, whitish-grey.

Growing at the side of the track to Butterfly Creek, Eastbourne, Wellington, New Zealand (D. A. Crawford and J. H. Warcup No. 68, June, 1946).

Spores 3–5 x 2·5–4μ white, smooth walled, drop shaped, aguttate to once guttulate, apiculus terminal.

Basidia 3·4–5μ wide by –21μ long, clavate, slender, clamped at base; sterigmata (2–) 4, 4–5μ long with a slight outward curvature. Hymenium amphigenous, absent from stalk and lower parts of branches, –25μ wide. Colour in cytoplasm of hymenium layer.

The swollen apices in transverse section show a pseudoparenchymatous central medulla of longitudinal hyphae, surrounded by an inflated aerenchymatous region, traversed by strands of loosely interwoven hyphae, passing from the central medulla to an outer compact region underlying the irregularly convoluted hymenium, and filling the knob-like projections (see text-fig. IV). Apparently growth in the apical region becomes localized at a number of areas, giving rise at first to fairly regular rounded projections, but later with further outward growth these extend and become more irregular. A transverse section of a branch below



TEXT-FIG. IV.

Tumidapexus ravus.

A. Swollen apex × 3½. B. Transverse section through apical region. C. Transverse section through branch just below final division. D. Medullary hyphae showing different types of clamps and branching. E. Spores. F. Portion of hymenium showing mature basidium and developing basidia. Magnification of B and C approx. × 18, D, E & F × 750.

the swollen apex shows a central loose pseudoparenchymatous medulla surrounded by a uniform subhymenium and hymenium.

Hyphae monomitic, 2–6μ wide, not inflated, length variable, clamped; walls slightly thickened. Medullary hyphae elongated, a few interwoven; clamps often elongated, swollen or extended into a branch. In subhymenium hyphae narrower, shorter and interwoven, clamps normal.

The swollen apices with their irregular growth separate this species from other members of the Clavariaceae. However, hyphal and basidial structure is in line with the characteristics of the family as is the amphigenous hymenium, extending from the upper branches to the apices.

LENTARIA Corner.

Lentaria surculus (Berk.) Corner 1950, p. 444.

Text-fig. 5.

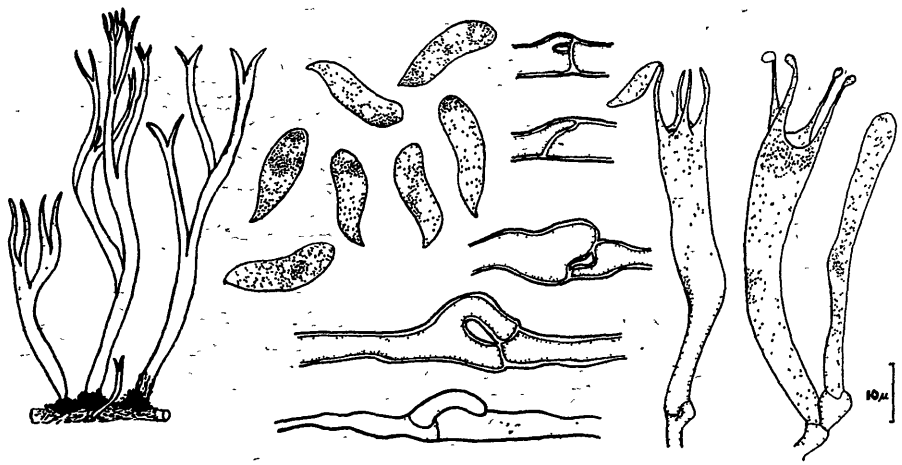
Basonym: *Clavaria surculus* Berkeley 1842, p. 154, t. 6, f. 5.

DISTRIBUTION: Waikaremoana, North Island, New Zealand, May, 1949, No. 187. Plants found growing at the base of *Dacrydium cupressinum* with a mass of mycelium covering the litter, twigs and leaves.

Fruit body ~4 cm. high (mostly 2 cm.), caespitose to densely gregarious; pinkish-flesh colour when fresh, drying a cream-fawn to tan colour; mycelium cream-white, permeating the litter, with plants often arising from a dense patch on a twig: stem distinct, branches few to several, 2–4-chomotous below, dichotomous at tips, terete with tendency towards flattening, a few palmately branched; tips short and acute, or elongated.

Spores 14·5–20·5 x 4–5μ white en masse, creamy-yellow in dilute potash, smooth, cylindric-oblong to subsigmoid, with a subterminal apiculus, aguttate, thin walled.

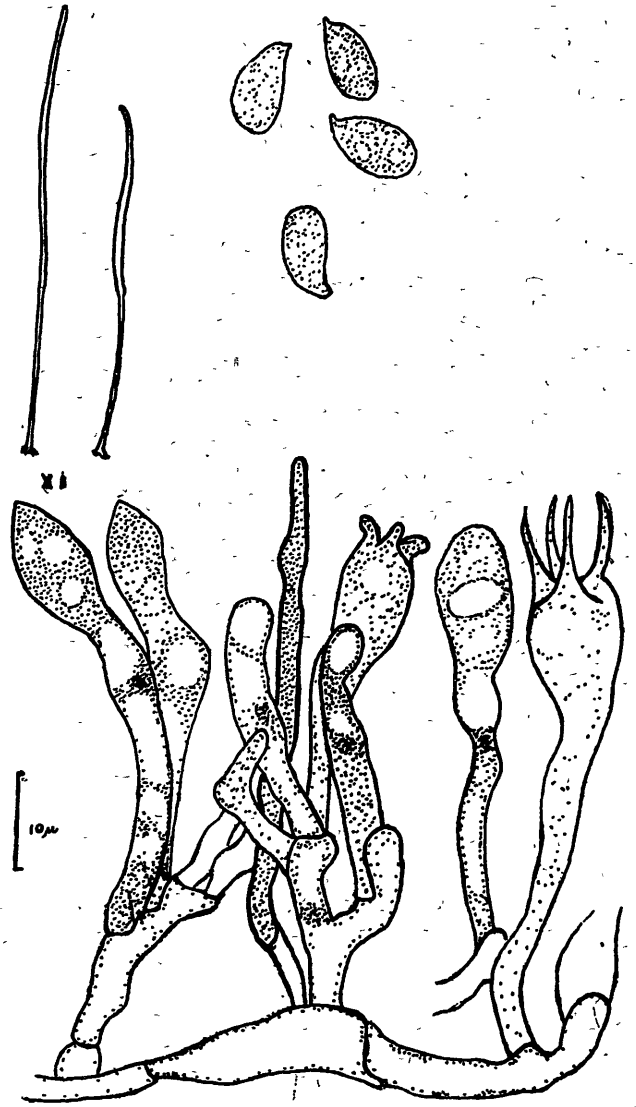
Basidia clavate, 40–50μ x 6–8μ, with (1–) 2–4 sterigmata 8–11·6μ long, erect with a slight inward curve.



TEXT-FIG. V.

Lentaria surculus.

Fruit body on left, × 2; Spores, hyphae and basidia, × 750.



TEXT-FIG. VI.
Clavariadelphus junceus.
Fruit bodies, × 1; Spores and portion of hymenium showing young basidia, caulocystidium with denser contents and thickened wall, and mature basidium, × 1300.

Hyphae monomitic, irregularly inflated, even convoluted, walls thin to thickened, contents granular, clamped with variously shaped clamps, some swollen others elongated.

There appears to be little to separate the small (–6 cm.) North Temperate *L. byssiseda*, from the larger (–11 cm.) pan tropical *L. surculus*, except the difference in size and distribution. The New Zealand plants are closer in size to the smaller *L. byssiseda*, but microscopically they agreed so well with *L. surculus* that it seems advisable to apply the latter older name to the New Zealand specimens.

Macroscopically these *Lentaria* specimens could be confused with *Tremellodendropsis*. However, in the latter the hyphae are not inflated and the mycelium is much less prominent.

Clavariadelphus Donk.

Clavariadelphus junceus (Fr.) Corner 1950, p. 275.

Text-fig. 6.

Colenso 1896, p. 614 (recorded for New Zealand as *Clavaria juncea*).

Waikaremoana, North Is., New Zealand. Growing on twigs and leaves in mixed podocarp-broadleaf rain forest, May, 1949, No. 207.

Fruit body –8 cm. high, simple, solitary, filiform, slender and elongated; stalk distinct ½-⅔ total height, 0·5 mm. wide, hyaline; fertile region white to slightly cream when fresh, turning drab fawn with age or handling, width 0·5 mm.–1 mm., tip pointed; base attached by an appressed pad of hyphae; flesh rigid, juicy, flaccid with age, when dry brittle and papery.

Spores scarce, 6–8·5μ x 3·4–4·2μ, white, smooth, thin walled, oblong-drop shaped to amygdaliform, aguttate.

Basidia 24–51μ long x 6–9·5μ wide, clavate with a tapered clamped base; sterigmata 4, –7μ x 2·5μ spreading then slightly incurved. Old basidia become embedded in thickening hymenium.

Caulocystidia (hyphal ends on the stem surface resembling cystidia or sterile basidia) rare but present in the outer layers, especially towards base; variable in length, 2·5–3·5μ wide; contents may be denser than other hyphae, walls slightly thickened.

Hyphae of subhymenium interwoven, narrow, medullary hyphae elongated, inflated, 8–18μ wide, with occasional narrow uninflated hyphae 3–5μ wide; clamps present though in some cases they are very small.

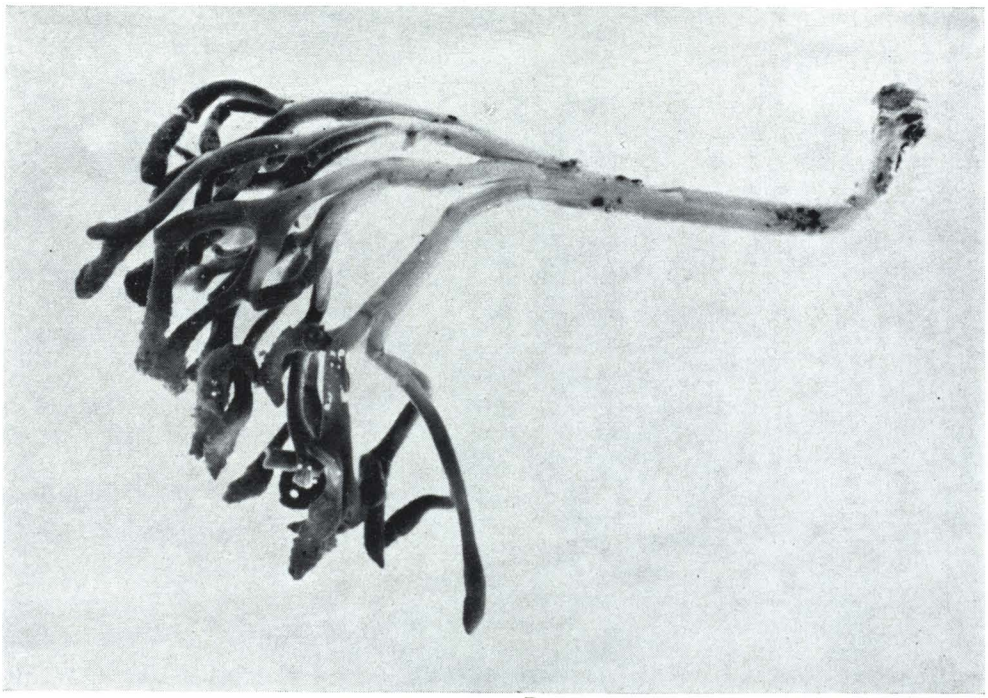
The New Zealand specimens differ from the Northern Hemisphere *C. junceus* in being white when young, deepening to cream and finally a drab colour with age, instead of the pale brownish-ochraceous recorded by Corner. Similar white specimens have been collected in the Dandenongs, Victoria, Australia. Cleland (1935, p. 269, under *Typhula juncea*) mentions white to pallid yellowish plants collected in South Australia. As these specimens appear identical to *C. junceus* in all other respects, they are regarded as pallid forms of that species rather than a distinct variety.

Colenso's record (1896, p. 614) consists only of its mention in a list of New Zealand fungi (probably from Hawke's Bay) identified for him by the then Director of Kew. Cooke, 1879, p. 57, includes *C. junceus* in a paper on New Zealand fungi, based on collections of Berggren. The specimens however were collected near Melbourne, Victoria, Australia.

Acknowledgments

The writer would like to express her sincere thanks to the following people who have been of assistance in enabling this study to proceed: the Research Grants Committee of the University of New Zealand for grants towards collecting and travelling expenses in 1949; Dr. E. J. H. Corner for much valuable assistance; Dr. J. G. Gibbs for material collected; Dr. J. H. Warcup who instigated the study and started the first collections; the Director of Kew Royal Botanical

A



B

A. *Tremellodendropsis transpusio.* Fruit body, × 4. B. *Tumidapexus ravus.* Fruit body, × 4.

Gardens, for facilities to examine types in the Kew Herbarium; and finally to Prof. J. G. Wood for facilities to work at the Botany Department of the University of Adelaide.

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