

## Cook Island Basidiomycete(+) Collections

Jerry Cooper, July 2011

### *Agaricus*

Several species of *Agaricus* are reported from Hawaii and Papua New Guinea but there are surprisingly few published records of *Agaricus* in the south and none for the Cook Islands. Further field notes are required to identify *Agaricus* collections adequately, especially any changes in colour (red/yellow) and smell of fresh fruitbodies (oily/aniseed).

### *Agaricus* spp.

Material examined: RR/111, Site: Takitumu Conservation Area, Rarotonga, Col.: L. Dagenais, 17/12/2004. RR/094b, Site: Tūpapa, Rarotonga, Col.: E. Saul, G. McCormak, 04/12/2004.



RR/111

*Arcyria* – the genus belongs to the cellular lime moulds. They are studied by mycologists, but actually are protists (in a broad sense). They spend most of their life cycle as a multinucleate plasmodium which ingests bacteria and other particles. The fungus-like forms are the fruiting structures. The group is relatively small in number (compared to the Kingdom fungi at least) and many species are widely distributed across the world. See also *Hemitrichia*, *Lycogala* and *Stemonitis*, later in this list.

### *Arcyria incarnata*

Material examined: RR/070, on/with *Cecropia*, rotten wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 01/12/2004.

Notes: This is a very widely distributed species.



RR/070

*Bolbitius* -A member of the Bolbitaceae along with common genera like *Conocybe* and *Agrocybe*. Three species of *Bolbitius* have been recorded from Hawaii and none from the other islands.

### *Bolbitius* c.f. *reticulatus*

Material Examined: RR/323, Site: southern end cross-island walk, modified forest, Rarotonga, Col.: P.R. Johnston, 17/01/2005.

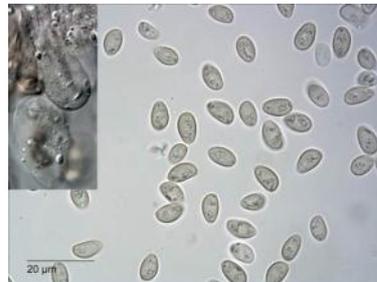
Notes: Cap 12-20 mm. Stem without caulocystidia. Cap hymeniderm, without cystidia. Spores very pale and with germ pore. Broad vesiculose cheilo and pleurocystidia seen, but not easy to observe. In this material it isn't clear if the basidia are 2 or 4 spored. Spore length  $\mu=9.0\ \mu\text{m}$ ,  $\sigma=0.4$ , width  $\mu=5.3$ ,  $\sigma=0.3$ ,  $Q\ \mu=1.7$ ,  $\sigma=0.1$ ,  $n=9$ . Not *B. coprophilus* as the spores are too small. This is much closer to non-veined forms of *B. reticulatus* (e.g. sensu Kuo MushroomExpert.com)



RR/323



RR/323



RR/323:cystidia and spores

*Calocera* – This is a member of the Dacrymycetales, a group of jelly fungi possessing basidia which look like tuning forks. Historically many species of *Calocera* and *Dacrymyces* with small morphological differences. It remains to be seen if these historical distinctions hold up to molecular scrutiny. *C. cornea*, *furcata*, *fusca* and *glossoides* have been reported from the islands

***Calocera cornea***

Material Examined: RR/049, on/with *Fitchia*, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 23/11/2004. RR/632, dead wood, Site: Ikurangi, Rarotonga, Col.: P.R. Johnston, 04/07/2005. RR/053, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 25/11/2004.

Notes: This is *Calocera cornea* sensu lato. The fungus is growing on angiosperm wood. The spores are 1-septate 8.3 x 3.9 and slightly constricted. Thick walled dendrohyphidia are present. RR/053 is different in having a white basal tomentum. The species has been recorded previously in Papua New Guinea.



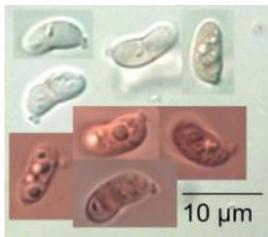
RR/632



RR/632



RR/049



RR/049 Spores



RR/053



RR/632

***Campanella*** - Species are commonly encountered in the tropics. Seven or eight species have been recorded from the Pacific Islands *C. alba*, *boninense*, *candida*, *cucullata*, *eberhardtii*, *junghuhnii*, *sarasinii* and *simulans*.

***Campanella* RR/033**

Material Examined: RR/033, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: L. Dagenais, 22/11/2004.

Notes: The blue colour seems to be a property of the fungus and not an external stain. The cap is gelatinised, with embedded crystals (in Melzers). Cystidia are present and are thin-walled. This falls into Singer's section *aeruginea*. Spores were not found in this material and further identification was not possible.



***Campanella c.f. candida***

Material Examined: RR/365, fallen wood, Site: Te Kou track, disturbed forest near bottom, Rarotonga, Col.: P.R. Johnston, 19/01/2005. RR/097, branches, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 10/12/2004. RR/527, fallen twigs, Site: Raemaru Track, below summit, Rarotonga, Col.: P.R. Johnston, 28/06/2005. RR/324, on/with coconut, husk of fallen nut, Site: southern end cross-island walk, modified forest, Rarotonga, Col.: P.R. Johnston, 17/01/2005. RR/333, fallen wood, Site: Raemaru Tr, unofficial alternative route up valley, modified forest, Rarotonga, Col.: P.R. Johnston, 18/01/2005.

Notes: The gills of this taxon dry a pale orange colour. The cap tissue has embedded rhomboidal crystals and the tissue is strongly gelatinised. The surface hyphae have a ramealis structure. The gills have encrusted metuloid cystidia, where the encrustation also consist of rhomboidal crystals. Hyphal 'hairs' are also present on the gills. The basidia are 2-spored, and the discharged spores frequently stick together. The spores are mostly regular in outline, 10-10.5 x 6-6.5um, ellipsoid, cyanophilous and collapsing. All hyphae are clamped.

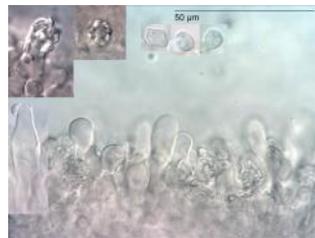
This taxon is in the group with *C. diplocystis* and *C. aequitorialis*. The Cook Island collections are clearly characterised by 2-spored basidia, large ellipsoid spores and encrusted metuloid cystidia. Seven or eight species are known to occur in the islands and they are all 4-spored except two. *C. alba*, collected in Hawaii is described as having 2-4 spored basidia but has nearly triangular spores. *C. candida* is described as 2-spored. This species was described from Fiji in 1909 and not collected subsequently. The spores of *C. candida* were described as subglobose and 4-5um but Singer questioned the veracity of these measurements but did not examine the type (Singer R, The Laschia Complex, Lloydia, v8, p170, 1945). Singer also noted the similarity of *C. candida* to *C. simulans*, which also has cystidia but is 4-spored. *C. simulans* var. *bispora* described from India, and subsequently recorded from Madagascar, is 2-spored and possesses thick-walled cystidia but without encrustation. There is a very strong possibility this Cook Island material is *C. candida*, re-discovered after 102 years. The type would need to be examined for confirmation of spore size.



RR/333



RR/333



RR/333: cystidia and spores



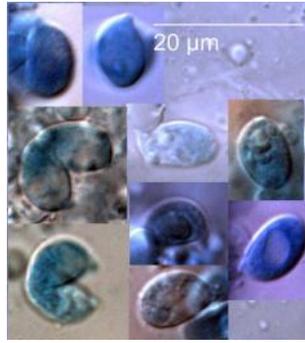
RR/333



RR/365



RR/097



RR/097: spores (in cotton blue)



RR/097



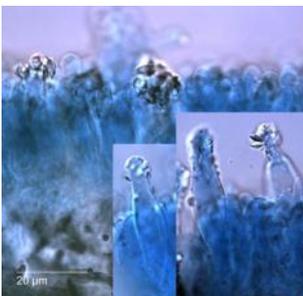
RR/527



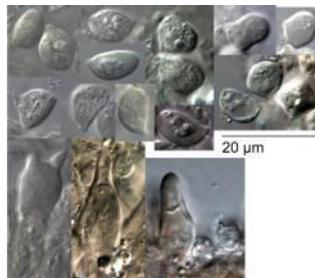
RR/097



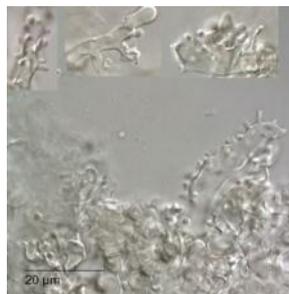
RR/527



RR/097: metuloid, encrusted cystidia (in cotton blue)



RR/527



RR/324: ramealis cap surface

## Database Report



RR/324:cystidia and basidia



RR/324:cystidia and spores

***Chaetocalathus*** - Closely related to the centrally stipitate *Crinipellis*. Two species of *Chaetocalathus* are known in the islands. *C. columellifer* has been reported from Fiji (under the name *Lentinus gibbsiae*). It has a central columella and thin walled dextrinoid cap hairs which are forked.

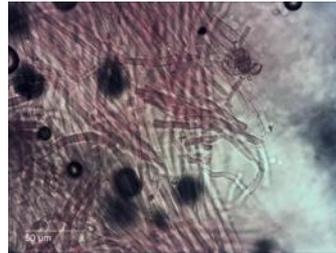
***Chaetocalathus liliputianus***

Material Examined: RR/526, fallen twigs, Site: Raemaru Track, near 'unofficial' end, Rarotonga, Col.: P.R. Johnston, 28/06/2005. RR/436, decorticated wood, Site: Barringtonia remnant, on coast between Avarua and Matavera, Rarotonga, Col.: P.R. Johnston, Det.: P.R. Johnston, 23/01/2005.

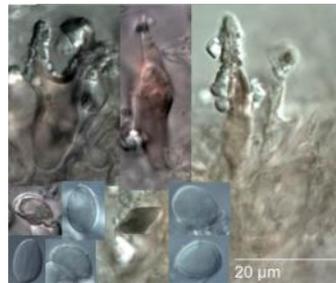
Notes: the cap hairs are dextrinoid (but only if not pre-treated with KOH). The cheilocystidia are dextrinoid, crystal encrusted, occasionally forked. The spores are thin-walled, collapsing, often stuck together.



RR/526



RR/526: dextrinoid cap hairs



RR/526: cystidia and spores



RR/526



RR/526

***Clitocybula*** – a genus possessing subglobose amyloid spores. Sequence analysis of some species place them in Moncalvo's /hydropid clade, along with *Gerronea*, *Megacollybia* and *Hydropus*. There is circumstantial evidence to suggest this group has its stronghold in the southern hemisphere and the tropics, although *Clitocybula* has not previously been recorded from the islands.

***c.f. Clitocybula RR/023***

Material examined: RR/023, coconut shell, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 18/11/2004.

Notes: The spores are amyloid and the rest of tissue inamyloid. Cap partially gelatinised, and with oleiferous hyphae. Gills slightly decurrent and not forked. This has a *Xeromphalina*-appearance with a strong basal tomentum but without the colour of *Xeromphalina*. The stem apex has cylindrical caulocystidia, stem hyphae thick-walled, clamped. Spores length  $\mu=5.6$ ,  $\sigma=0.2$ , width= $\mu=4.7$ ,  $\sigma=0.4$ ,  $Q \mu=1.2$ ,  $\sigma=0.1$ ,  $n=7$ . Most described *Clitocybula* appear to be grey/fawn and not white and with a striate cap. The assignment of this collection to *Clitocybula* is speculative and probably incorrect.



RR/023



RR/023:cap surface.

***Clitocybula RR/458***

Material examined: RR/458, fallen wood, Site: side of track to Avana water intake, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 25/01/2005.

Notes: Cap 30-50 mm, a cutis with pale brown vesicles (characteristically hydropoid-like), no encrusting pigment. Thick-walled hyphae not seen in cap. Oleiferous hyphae present. Hyphae clamped. Mainly 4, but some 2-spored. No cheilocystidia. Spores length  $\mu=7.6 \mu\text{m}$ ,  $\sigma=0.5$ , width  $\mu=6.8 \mu\text{m}$ ,  $\sigma=0.5$ ,  $Q \mu=1.1$ ,  $\sigma=0.1$ ,  $n=11$ . This is Singer's leucopaxilleae/clitocybula/subgenus clitocybula. Not radially fibrillose/striate/lacerate like most described species (this is not *C. lacerata*, or *C. abundans*).



RR/023



RR/458



RR/023:cauloocystidia (Melzers)



RR/023:stem hphae



RR/458



RR/023:cheilocystidia and spores (Melzers)





RR/458



RR/458:spores, cap (hydropid) vesicles and basidia

*Conocybe* – another member of the bolbitaceae along with *Bolbitius* and *Agrocybe*. At least 13 names have been recorded from the islands, and 5 from the Cook Islands: *C. apala*, *crispella*, *terasporoides*, *vinaceobrunnea* (type from the Cook Islands), and *zyelandica*. However many older use of *Conocybe* names must be treated with caution. Historical records of the often cited *C. siliginea* for example may represent any number of species.

***Conocybe* RR/099+**

Material examined: RR/099, lawn, Site: Tūpapa, Rarotonga, Col.: G. McCormak, 11/12/2004. RR/001, lawn, Site: Tūpapa, Rarotonga, Col.: G. McCormak, 11/11/2004.

Notes: Stipe not radicans. No caulocystidia and no pilocystidia. Cap with just spherical cells. Caulocystidia rare and only hair-like - section Pilosellae. Cheilocystidia not lecythiform. 2-spored, length  $\mu=12.3$   $\mu\text{m}$ ,  $\sigma=0.4$ , width  $\mu=8.9$   $\mu\text{m}$ ,  $\sigma=0.4$ , Q  $\mu=1.4$ ,  $\sigma=0.1$ , n=11. RR/099 has quite a number of giant arrow-head shaped spores. The cylindrical, rather than lecythiform cheilocystidia make this species difficult to assign to obvious candidates such as *C. rickenii*.



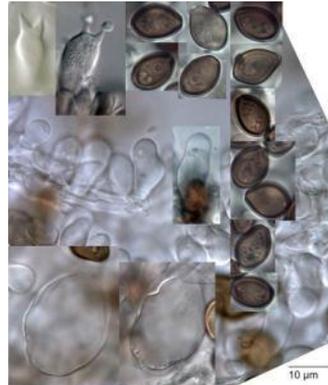
RR/001



RR/001



RR/001



RR/001:basidia, cheilocystidia, pleurocystidia and spores

*Coprinellus/Coprinopsis* – historically lumped into a larger and clearly heterogeneous concept of *Coprinus*. Reported from the islands are *Coprinellus curtus*, *disseminatus*, *domesticus*, *micaceus*, *pellucidus*, *plagioporus*, *radians*, *truncorum*, *verrucispermus*, *Coprinopsis candidolanata*, *cinerea*, *cothurnata*, *extinctoria*, *fibrillosa*, *friesii*, *lagopu*, *myceliocephala*, *picacea*, *radiata*, *sclerotiorum*, *sejuncta*, *stercorea*, *urticicola* var. *hawaiiensis*, *verticillata*, *villosa*. None previously reported from the Cook Islands. See also *Parasola* in this list

***Coprinellus* RR/085+**

Material examined: RR/085, on/with *Hernandia*, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 03/12/2004. RR/084, on/with *Fagraea*, Site: Takitumu Conservation Area, Rarotonga, Col.: L. Dagenais, 02/12/2004.

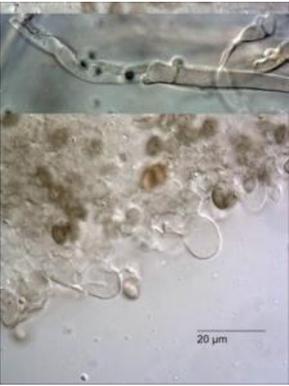
Notes: Cap to 2 cm, pale grey. Gills and spores dried dark chocolate brown. Cap not radially grooved, fibrous. Stem with basal profuse cream tomentum. Gills not free, not mottled, no chrysocystidia. Cap cellular, with setules. Spores not thin-walled, pleurocystidia absent. *Coprinellus* sect *setulosi* or *Psathyrella*? With germ pore. Stipe glabrous. Cap with pale tan clamped hairs, not capitate (like *C. curtus*). See also record of *P. c.f. inquinata*? Not *C. disseminatus*.



RR/085



RR/085:spores (KOH)



RR/085:top: cap hairs, bottom: cheilocystidia

***Coprinellus aff. disseminatus***

Material examined: RR/406, fallen wood, Site: Te Manga Track, forest below summit ridges, Rarotonga, Col.: P.R. Johnston, Det.: P.R. Johnston, 21/01/2005. RR/407, dead wood, Site: Te Manga Track, disturbed forest near base, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 21/01/2005. RR/059, on/with *Hernandia*, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: L. Dagenais, 25/11/2004.

Notes: Pilocystidia with cylindrical neck. Cap sphaerocysts not seen (but material dried badly). None of the material was appropriate to examine the veilar material properly. Spores appear to have a hyaline cap, which would make this not *C. disseminatus*. Caulocystidia like cap. Stem tissue slightly dextrinoid. Base of stem with coarse ozonium. Spores brown in melzers. length  $\mu=9.0 \mu\text{m}$ ,  $\sigma=0.7$ , width  $\mu=4.4 \mu\text{m}$ ,  $\sigma=0.4$ ,  $Q \mu=2.1$ ,  $\sigma=0.2$ ,  $n=13$ .



RR/406



RR/407



RR/407



RR/407:pilocystidia and spores

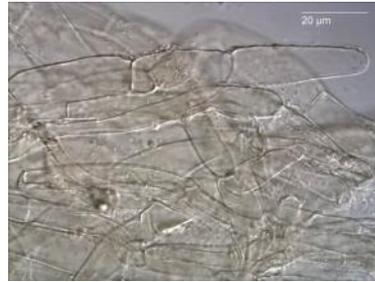


RR/059

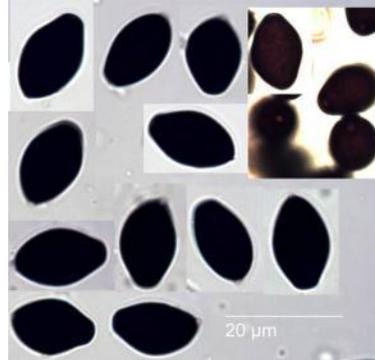
***Coprinopsis aff. macrocephala***

Material examined: RR/454 on lawn, Site: Fruits of Rarotonga, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 25/01/2005.

Notes: Cap 10-25 mm, veil filamentous, clamped, 4-spored. Pore apical. Spore length  $\mu=15.4 \mu\text{m}$ ,  $\sigma=1.0$ , width  $\mu=9.5 \mu\text{m}$ ,  $\sigma=0.4$ ,  $Q \mu=1.6$ ,  $\sigma=0.1$ ,  $n=12$ . *C. macrocephalus* is not a lawn species and the spores do not show the lateral constriction and caps are less cylindrical when young. This is also different to the NZ collections labelled *C. macrocephalus* which also aren't *C. macrocephalus* sensu stricto.



RR/454:veil.



RR/454

***Coprinopsis urticicola* var. *hawaiiensis***

Material examined: RR/524, fallen wood, Site: Raemaru Track, below summit, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 28/06/2005.

Notes: Young caps powdery white, white scales moving apart to reveal darker beneath with age, mature caps with ring of white hyphae at base of stipe. When fresh caps up to about 18 mm. Veil filamentous, diverticulate, no setules. 4-spored. length  $\mu=8.3 \mu\text{m}$ ,  $\sigma=0.3$ , width  $\mu=6.5 \mu\text{m}$ ,  $\sigma=0.4$ ,  $Q \mu=1.3$ ,  $\sigma=0.1$ ,  $n=10$ . Germ pore broad, 2 $\mu\text{m}$ . First record other than Hawai'i – if correctly identified.



RR/524



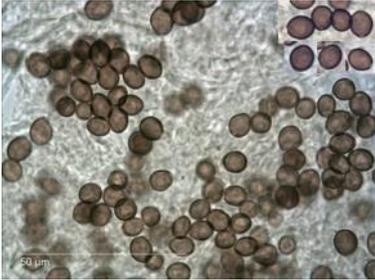
RR/524



RR/524



RR/524



RR/524



RR/524:veil

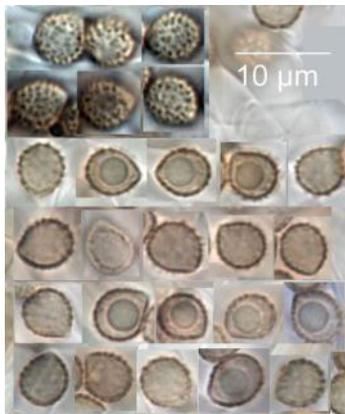
plasmatic content in KOH. On dried material the gill edge is noticeably bright apricot.



RR/046:cheilocystidia (KOH)



RR/046:cap surface



RR/046: spores

*Crepidotus* – 28 names have been used for *Crepidotus* species across the islands although many are early names applied to material without recent investigation. None previously reported from the Cook Islands.

***Crepidotus* RR/046**

Material examined: RR/046, on/with *Fitchia*, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 23/11/2004.

Notes: Cap to 3cm, Spores subglobose, ornamented, lightly guttiform length  $\mu=5.8 \mu\text{m}$ ,  $\sigma=0.3$ , width  $\mu=4.8 \mu\text{m}$ ,  $\sigma=0.3$ ,  $Q \mu=1.2$ ,  $\sigma=0.1$ ,  $n=20$ , 4- spored. Hyphae clamped. No stipe. With dense tomentum near point of attachment. Terminal cap hyphae not differentiated, not coloured, not encrusted. Cheilocystidia cylindrical, without crystals. Seems close to *C. mutabilis* but paler capped. Cheilocystidia have a yellow

***Crepidotus aureus***

Material examined: RR/334, fallen wood, Site: Raemaru Tr, unofficial alternatier route up valley, modified forest, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 18/01/2005. RR/606, fallen twigs, Site: Cross Island walk, northern end, before stream, Rarotonga, Col.: P.R. Johnston, 30/06/2005. RR/554, fallen twigs, Site: Raemaru Track, near 'unofficial' end, Rarotonga,

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Col.: P.R. Johnston, 28/06/2005. RR/554, fallen twigs, Site: Raemaru Track, near 'unofficial' end, Rarotonga, Col.: P.R. Johnston, 28/06/2005.

Notes: Cap up to 12 mm diam., with very short substipe, cap finely hairy, tomentose toward point of attachment. Hyphae clamped, spores rough, spherical 6.5-8µm. Cap hairs about 5µm in diameter and thick walled (unlike NZ *C. parietalis*). This has thick-walled crystal encrusted cystidia, but the crystals are fragile and spread easily in a squash. 2-3-4 spored, not mentioned in Egon Horak's description of *C. aureus* but this appears identical in every other respect. *C. stromaticus* sensu Hems recorded from Hawaii is sulphur yellow whereas the type from Australia is described as tan. No descriptions of *C. stromaticus* mention crystal encrusted cystidia of the *C. episphaeria* group. The recently described *C. flavus* has cheilocystidia that are fusoid to lageniform.



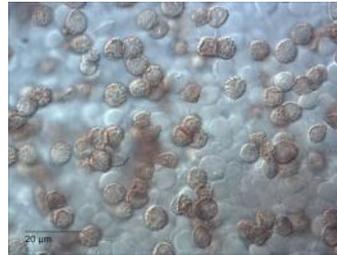
RR/334



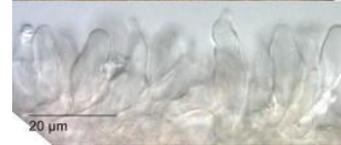
RR/334



RR/334



RR/334



RR/334:cheilocystidia



RR/606



RR/554



RR/554



RR/554:upper left: cap hyphae. Right spores; lower cheilocystidia.

***Crepidotus c.f. mollis***

Material examined: RR/440, bark of fallen wood, Site: Barringtonia remnant, on coast between Avarua and Matavera, Rarotonga, Col.: P.R. Johnston, 23/01/2005. RR/003, bark, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 15/11/2004.

Notes: Cap 10-30 mm. Cap gelatinised. Gills with cylindrical cheilocystidia (not observed in RR/033), hyphae unclamped, 4-spored, smooth, ellipsoid, length  $\mu=7.0 \mu\text{m}$ ,  $\sigma=0.4$ , width  $\mu=5.0 \mu\text{m}$ ,  $\sigma=0.3$ , Q  $\mu=1.4$ ,  $\sigma=0.1$ , n=20



RR/440



RR/440



RR/440



RR/003



RR/003



RR/003:cap hyphae

*Cyathus* – Bird’s Nest fungi, along with *Nidularia*. 15 names of *Cyathus* are recorded from the islands, none from the Cook Islands.

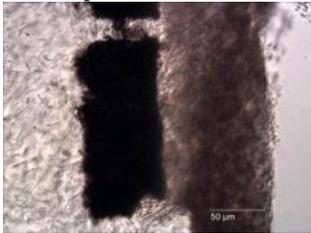
***Cyathus triplex***

RR/462, on/with *Inocarpus fagifer*, fallen nut husk, Site: side of track to Avana water intake, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 25/01/2005.

Notes: Peridioles to 1.8mm. Wall consisting of two layers. Peridiole with silvery coating. Cups with coarse spreading hairs. Not plicate. Spores way too big for *C. pallidus*, length  $\mu=17.2 \mu\text{m}$ ,  $\sigma=0.5$ , width  $\mu=10.3 \mu\text{m}$ ,  $\sigma=0.5$ , Q  $\mu=1.7$ ,  $\sigma=0.1$ , n=10. The very thick walled spores of this collection are closer to *C. crassimurus* than *C. triplex* but the clear double wall of the peridiole make this *C. triplex*. It is worth noting that that collections labelled *C. crassimurus* and *C. triplex* come out together in trees. Possibly there are too many names for the number of real taxa in this group. This probably in the *C. striatum* group.



RR/462



RR/462:double layer of peridium



RR/462:spores

*Cyptotrama* - is a genus with few described species. *Cyptotrama asprata*, *costesii* and *granulosa* are known from the islands. *C. costesii* has an olivaceous colour which is plasmatic, and *C. granulosa* cinnamon coloured and appears to be known only from the original record from Easter Island. None recorded from the Cook Islands.

***Cyptotrama asprata***

Material examined: RR/079, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 02/12/2004. JAC11837, (RR/553), fallen wood, Site: Raemaru Track, near 'unofficial' end, Rarotonga, Col.: P.R. Johnston, 28/06/2005.

Notes: Cap to 8mm diam., top yellow, gills white, stalk yellow



RR/079



RR/079

***c.f. Delicatula***

Material examined: RR/063, on/with *Weinmannia*, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 26/11/2004.

Notes: cap to 5mm diam. and cap inverting on drying. Cap a ramealis cutis, not gelatinised, clamped. Spores amyloid. Stem base dextrinoid? Stem with short cylindrical cystidia. Stem insiticious. Gill edge concolorous. Spores small, length  $\mu=5.0$ ,  $\sigma=0.4$ , width  $\mu=2.9$ ,  $\sigma=0.3$ , Q  $\mu=1.7$ ,  $\sigma=0.2$ , n=7. Hard to know if a veil was present or not. This has the jizz of a *Delicatula* rather than *Mycena* (and like an amyloid spored version of *Gloiocephala*) but is probably something else. Note that Singer indicated that there are many tropical *Mycenas* looking like *Delicatula* but without veil. The gill cystidia here are *Gloiocephala*-like.



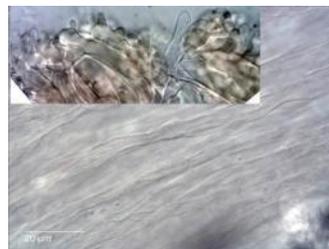
RR/063



RR/063:caulocystidia



RR/063:gill cystidia and spores (melzers)



RR/063:cap

*Galerina* – This genus currently covers a wide range of morphology, substrates and associations and will no doubt eventually be split into quite a number of monophyletic fragments. Nine names for *Galerina* species occur in the literature from Hawaii, none from the Cook Islands.

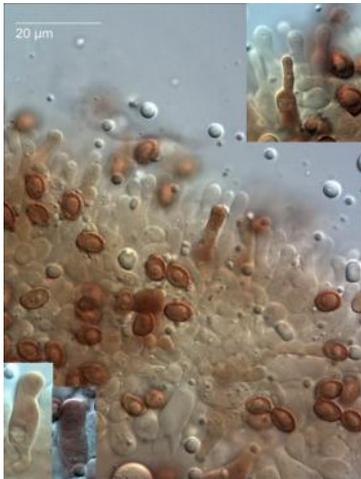
***Galerina aff. marginata***

RR/104, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: L. Dagenais, 13/12/2004.

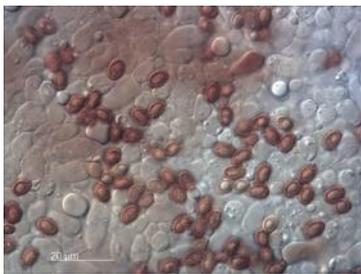
Notes: Pleuro & cheilocystidia with yellow/brown content. Cheilocystidia with extended neck, not tibiform. Pleurocystidia utriform/cylindrical. Hyphae clamped. Stem not pruinose with caulocystidia. Stem with fibrillose ring. 4-spored. Spores without episore but with plage. *G. marginata* complex see Myc Res 105, p432.



RR/104



RR/104:cheilo & pleurocystidia (KOH)



RR/104:spores

***Galerina aff. nana***

Material examined: RR/048, coconut husk, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 23/11/2004. RR/022, Doubtful record, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 18/11/2004. RR/321, on/with *coconut*, husk of fallen nut, Site: southern end cross-island walk, modified forest, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 17/01/2005. RR/068, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 26/11/2004.

Notes: Cap to 25mm diam., often with central nipple (RR/022 may represent a different taxon). Hyphae clamped. Cheilocystidia not tibiform. Pleurocystidia present. Stem not pruinose with caulocystidia. 4- spored. Stem without a ring zone. Cystidia appear to be thick-walled, but without crystals. Spores with episore and plage.



RR/048



RR/048:pleurocystidium and spores



RR/022



RR/022

Database Report



RR/022



RR/321

**Geastrum** – Earthstars. Over 28 names of *Geastrum* species have been recorded in the islands. *Geastrum harotii* and *G. subiculosum* previously recorded from the Cook Islands.

***Geastrum subiculosum***

Material examined: RR/076, on/with *Hernandia*, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 02/12/2004.

Notes: Sessile, peristome fimbriate, growing on wood(?) and with subiculum. *G. hariotii* has a tubular sulcate peristome. Spores minutely rough, so not this is not *G. subiculosum* sensu Dennis (Fungi Venezuela), but seems to match with other descriptions. Note the existing image on the Cook Islands site is very unlikely to be *G. subiculosum*.



RR/076

***Gerronema*** – none previously reported from the islands. A member of Moncalvo's /hydropoid clade, along with *Clitocybula*

***Gerronema* RR/356+**

Material examined: RR/356, dead wood, Site: Te Kou track, forest below summit, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 19/01/2005. RR/571, on/with *Hibiscus*, fallen twigs, Site: Cross Island walk, northern end, before stream, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 30/06/2005.

Notes: Gills arcuate. Gills with vesiculose thin-walled cheilocystidia and oleiferous hyphae. 4-spored. Cap gelatinised, with brown plasmatic terminal elements, some

thick-walled hyphae, brown amorphous material and occasional rhomboid crystals.



RR/356



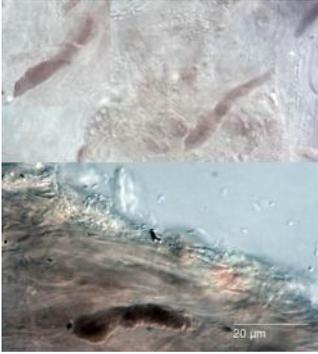
RR/356



RR/356



RR/356:cheilocystidia and spores



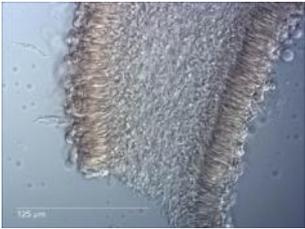
RR/356:vesicles in cap tissue. Lower: section through surface



RR/356:caulocystidia



RR/571



RR/571:gill trama



RR/571:cap squash



RR/356:lower: section through cap. Gill edge, & spores

**Gerronema RR/424+**

Material examined: RR/424, bark of fallen wood, Site: Turangi Stream, track between road and water intake, Rarotonga, Col.: 09/07/11

**Database Report**

P.R. Johnston, Det.: J.A. Cooper, 22/01/2005. RR/473, litter and twigs, Site: side of track to Avana water intake, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 25/01/2005.

Notes: Cap to 12mm. Hymenium seems to be covered in small amorphous granules. No tissue amyloid or dextrinoid or cyanophilous. Clamped. Cap a smooth ungelatinised cutis, without ornamentation, with a few erect cystidia. No hydropoid vesiculose pigmented elements. No pleurocystidia, cheilocystidia cylindrical, no caulocystidia. 4-spored, Spores appear to be stubbornly glued together in masses. Trama with occasional rhomboid crystals. Material nearly sterile. Stipe with restricted but distinct basal tomentum.



RR/424



RR/424:Cheilocystidia. inset section through cap.



RR/473



RR/473



RR/473



RR/473:glued spores

**Gloiocephala** – *Gloiocephala epiphylla* has been recorded from Hawaii and New Caledonia, and *G. tenuicrinita* from PNG. None recorded from the Cook Islands.

**Gloiocephala RR/469**

Material examined: RR/469, decorticated wood, Site: side of track to Avana water intake, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 25/01/2005.

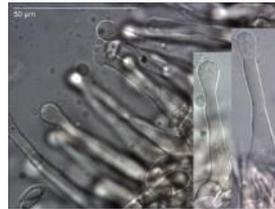
Notes: Cap to 8 mm; common at this site. Cap cystidia common and obvious. No tissue amyloid or dextrinoid. Gill cystidia like cap but fewer (perhaps?). spores length  $\mu=14.1 \mu\text{m}$ ,  $\sigma=0.7$ , width  $\mu=5.0 \mu\text{m}$ ,  $\sigma=0.4$ , Q 2.9,  $\sigma=0.2$ , n=9. This has the appearance of a *Resinomycena* but the spores are inamyloid.



RR/469



RR/469



RR/469:cystidia



RR/469:caulocystidia and spores.

**Gloiocephala RR/332+**

Material examined: RR/332, fallen wood, Site: Raemaru Tr, unofficial alternative route up valley, modified forest, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 18/01/2005. RR/415, dead wood, Site: Turangi Stream, track between road and water intake, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 22/01/2005. RR/338, fallen wood, Site: Raemaru Tr, unofficial alternative route up valley, modified forest, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 18/01/2005.

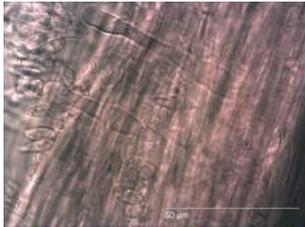
Notes: Cap to 12 mm; Material dries pale tan. Gills decurrent. Stipe insititious. Stem weakly dextrinoid, otherwise no reaction with tissue or spores. *Gloiocephala*-cystidia present on stem and rarely on gill edge (if at all?). No evidence of cap ornamentation. Clamps not seen. Spores not amyloid. 4-spored length  $\mu=15.9 \mu\text{m}$ ,  $\sigma=1.1$ , width  $\mu=5.2 \mu\text{m}$ ,  $\sigma=0.4$ , Q  $\mu=3.1$ ,  $\sigma=0.3$ , n=8; length  $\mu=14.5 \mu\text{m}$ ,  $\sigma=1.5$ , width  $\mu=5.6 \mu\text{m}$ ,  $\sigma=0.5$ , Q  $\mu=2.6$ ,  $\sigma=0.2$ , n=16.



RR/332



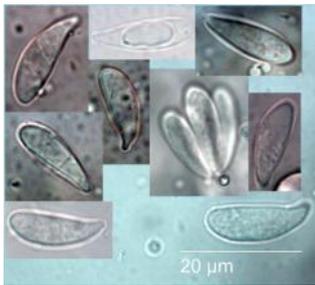
RR/332



RR/332



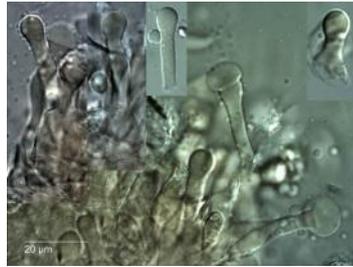
RR/332:basidia and cheilocystidium



RR/332:spores



RR/415



RR/415:caulocystidia



RR/415:spores



RR/338



RR/338



RR/338

*Glomus* – A member of the Glomeromycota which form arbuscular mycorrhizas with many plants. Commonly known as pea-truffles.

***Glomus macrocarpum***

Material examined: RR/373, soil, Site: Te Kou track, forest below summit, Rarotonga, Col.: P.R. Johnston, 19/01/2005.



RR/373



RR/373



RR/373:chlamydospores

*Gymnopilus* -11 names used for records across the islands, none from the Cook Islands.

***Gymnopilus aff. liquiritiae***

Material examined: RR/447, fallen tree, Site: Cross Island walk, northern end, before stream, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 24/01/2005.

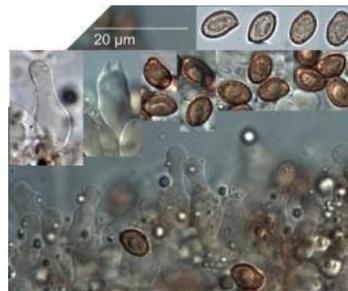
Notes: Up to 70 mm diam., tough woody stalk, no ring, bright orange-brown cap and gills. Spores > 7µm, dextrinoid, (definitely). Without pleurocystidia or caulocystidia. Not *G. subtropica*, differences in many characters, and too robust for *G. austropicreus*. From Smith this would rather come to *G. echinulisporus* but cystidia different. Spores echinulate, without plage, length  $\mu=7.3$   $\mu\text{m}$ ,  $\sigma=0.4$ , width  $\mu=4.9$   $\mu\text{m}$ ,  $\sigma=0.3$ , Q  $\mu=1.5$ ,  $\sigma=0.0$ , n=12.



RR/447



RR/447



RR/447: upper spores in water, lower in melzers. Basidium and cheilocystidia.

*Hemitrichia* – Genus of slime moulds. See *Arcyria*

***Hemitrichia calyculata***

Material examined: RR/081, rotten wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 02/12/2004.



*Hohenbuehelia* – a genus with hyphal structure exuding drops of toxin poisonous to nematodes. There are numerous described species which appear to be very close morphologically.

***Hohenbuehelia* RR/423+**

Material examined: RR/423, bark of fallen wood, Site: Turangi Stream, track between road and water intake, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 22/01/2005. RR/374, dead wood, Site: Te Kou track, forest below summit, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 19/01/2005. RR/550, fallen twigs, Site: Raemaru Track, below summit, Rarotonga, Col.: P.R. Johnston, 28/06/2005. RR/558, fallen wood, Site: Raemaru Track, below summit, Rarotonga, Col.: P.R. Johnston, 28/06/2005.

Notes: 10-15 mm. This taxon seems to be distinctive in being quite frequently pinkish. Cap hoof-shaped, to 10mm, tomentose near point of attachment, gelatinous. Tomentose hairs are mainly gloeosphex. Gill cystidia of broad thin-walled vesiculose, gloeosphex, and metuloid encrusted. spores length  $\mu=6.1$   $\mu\text{m}$ ,  $\sigma=0.4$ , width  $\mu=3.5$   $\mu\text{m}$ ,  $\sigma=0.3$ , Q  $\mu=1.7$ ,  $\sigma=0.1$ , n=4; length  $\mu=6.4$   $\mu\text{m}$ ,  $\sigma=0.3$ , width  $\mu=3.5$   $\mu\text{m}$ ,  $\sigma=0.3$ , Q  $\mu=1.9$ ,  $\sigma=0.2$ , n=3. This is close to *H. cyphelliformis* auct NZFUNGI.



RR/423



RR/423



RR/423



RR/374



RR/374:cap tomentum



RR/374:cystidia



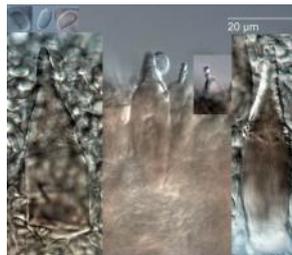
RR/550



RR/550



RR/550



RR/550



RR/550:gloeopshex, metuloid cystidia and spores (melzers)



RR/558



RR/558

*Hymenochaete* – 38 names appear in the Pacific Island mycological literature.

***Hymenochaete attenuata***

Material examined: RR/061, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 25/11/2004.

Notes: Setae length  $\mu=60.7 \mu\text{m}$ ,  $\sigma=4.6$ , width  $\mu=7.4 \mu\text{m}$ ,  $\sigma=0.8$ ,  $n=4$ m. No dendrohyphidia seen. Spores length  $\mu=4.3 \mu\text{m}$ ,  $\sigma=0.4$ , width  $\mu=2.1 \mu\text{m}$ ,  $\sigma=0.2$ ,  $Q \mu=2.1$ ,  $\sigma=0.2$ ,  $n=11$ . This the real *H. attenuata*, not sensu Cunningham. It has been recorded from Fiji and Hawaii.



RR/061



RR/061 :setae and spores

*Hypholoma* – *Hypholoma boninense* is described from the Bonin Islands, *H. fasciculare* recorded from Hawaii, and *H. jaluitense* described from the Marshall Islands.

***Hypholoma aff. fasciculare***

Material examined: RR/069, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 26/11/2004.

Notes: A miniature *H. fasciculare*, not *H. subviride*.



***Hypholoma c.f. subviride***

Material examined: RR/446, base of dead standing tree, Site: Cross Island walk, northern end, before stream, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 24/01/2005. RR/115, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 20/12/2004. RR/115, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 20/12/2004.

Notes: Caps 10-20 mm. This is not *H. fasciculare* sensu auct Europe. It is smaller, with browner colours and closer to *H. subviride* and the NZ *H. acutum* (and a number of other names for small, sometimes papillate taxa, e.g. *H. papillatum* Mexico). See also '*Psilocybe*' *fasciculare* var. *armeniacus*, Fuhrer's *Hypholoma* sp. and also *H. confusum*, and a number of collections by Horak e.g. ZT0626. Sequences of *H. fasciculare/subviride* show variability in the latter and sufficiently distance from *H. fasciculare* to be considered a separate species and not a variety. Note that *H. subviride* is described as sulphur yellow capped, which is not Pegler's (Borneo) concept.



RR/446



RR/446



RR/446



*Lentinus* – a characteristic taxon of the tropics. 48 names have been used in the Pacific fungal literature. None recorded from the Cook Islands.

*Lentinus sajor-caju*

Material examined: RR/034, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: L. Dagenais, 22/11/2004.

Notes: Cap to 3cm diam., top white with deep hollow, gills white. Gills dried tan. Without lamellulae. Gills decurrent. Cap a thick walled dimitic cutis, all hyphae becoming acuminate towards apex in all tissue (subgenus *Lentinus*). Gill edge not dentate. With obvious hyphal pegs under dissecting microscope, but not obvious in a slide mount. Cap edge is torn but not hairy. Despite lack of lamellulae this is obviously *L. sajor-caju*.



RR/034



RR/034

*Lenzites* – one example of a polypore, which are by far the most commonly collected and referenced group of fungi in the Pacific. See also *Microporus* in this list.

*Lenzites acuta?*

Material examined:RR/052, branch, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 25/11/2004.

Notes: Cap to 5cm diam. Dimidiate, applanate. Context cream. Cap blackening in KOH. Pileus without erect hairs, smooth. Nearly sterile, just a few allantoid spores. (16 x 5um but unsure if correct spores). Only thick-walled hyphae seen. Clamps not seen. This is just one example of many collections of polypores from the trip. Identification is likely to be incorrect. The context is not brown which it would have to be for *Hexagonia*. See *Antrodia malicola*, *Hexagonia tenuis*, and *Lenzites acutus* (accepted by Mycobank as *Daedalea flavida*), which is described as very variable.



RR/052



RR/052



RR/052

*Lycogala* – a slime mould – see *Arcyria*.

***Lycogala epidendrum***

Material examined: RR/375, dead wood, Site: Te Kou track, disturbed forest near bottom, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 19/01/2005.

Notes: pseudocapillitium 10um diam. Spores weakly reticulate 8um diam.



RR/375

*Marasmiellus* – I am using this genus in a broad sense for those taxa with no ornamented cystidia, without amyloid or dextrinoid reaction of tissue, with inamloid spores and usually without any ornamentation of the cap hyphae. Thus it is a catch-all for taxa not placed elsewhere but also probably not *Marasmiellus* sensu stricto. This group of ‘negative-character’ marasmioid fungi seems to be common in New Zealand at least, but with few described species. Some of the New Zealand taxa have long cap hairs. 16 names are recorded in the Pacific, with *Marasmiellus inoderma* featuring across many islands. This species is considered edible in Africa.

***Marasmiellus inoderma***

Material examined: RR/366, dead fern frond, Site: Te Kou track, disturbed forest near bottom, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 19/01/2005. RR/357, dead stem banana, Site: Te Kou track, disturbed forest near bottom, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 19/01/2005.

Notes: Cap 25-50 mm, stem with orange basal pad. Material dried tan. Gills have darker band towards edge in dried material. Stem with thick-walled hyphae, slightly dextrinoid towards base. Rest of tissue not amyloid or dextrinoid. Clamped. Cap a gelatinised cutis, without ornamentation. With oleiferous hyphae in gill. Gill tissue not easy to separate. Cheilocystidia with relatively small number of discrete seulae. 4- spored. Spores length  $\mu=9.0$   $\mu\text{m}$ ,  $\sigma=0.5$ , width  $\mu=4.8$   $\mu\text{m}$ ,  $\sigma=0.3$ , Q  $\mu=1.9$ ,  $\sigma=0.1$ , n=7



RR/366



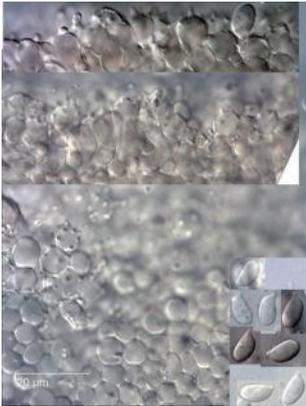
RR/366



RR/357



RR/357



RR/357:cheilocystidia and spores

**Marasmiellus RR/467/468**

Material examined: RR/467/468, fallen wood, Site: side of track to Avana water intake, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 25/01/2005.

Notes: Cap 18-30 mm. Coarse, brown hyphae at base of stipe; Hyphae clamped. Cap a broad entangled cutis, without ornamentation. 4-spored. With thick-walled hyphae. Stem not dextrinoid, with thick-walled hyphae. With simple hyphae-like caulocystidia. Spores few. Not sure what genus to put this in. Featureless. spores length  $\mu=10.0 \mu\text{m}$ ,  $\sigma=0.3$ , width  $\mu=3.9 \mu\text{m}$ ,  $\sigma=0.1$ ,  $Q \mu=2.5$ ,  $\sigma=0.2$ ,  $n=9$



RR/467/468



RR/467/468



RR/467/468



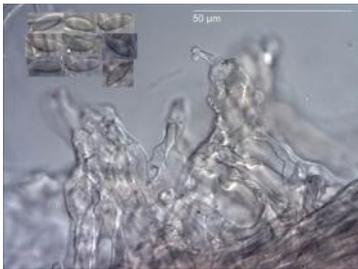
RR/467/468



RR/467/468



RR/467/468



RR/467/468:caulocystidia and spores

**Marasmiellus RR/082**

Material examined: RR/082, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 02/12/2004.

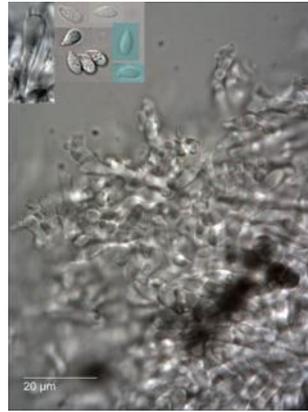
Notes: Cap to 4mm diam. Gills dried orange. Spores hyaline, inamyloid. Cap a rameales trichoderm. Gills arcuate. Clamped. Cheilocystidia, if present, basidiolar. Stipe pruinose. 4-spored. length  $\mu=7.1 \mu\text{m}$ ,  $\sigma=0.5$ , width  $\mu=3.3 \mu\text{m}$ ,  $\sigma=0.3$ ,  $Q \mu=2.1$ ,  $\sigma=0.1$ ,  $n=6$  Not an appropriate genus, but what else?



RR/082



RR/082



RR/082:main: section through cap. Inset: basidium, spores

**Marasmiellus RR/418**

Material examined: RR/418, dead wood, Site: Turangi Stream, track between road and water intake, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 22/01/2005.

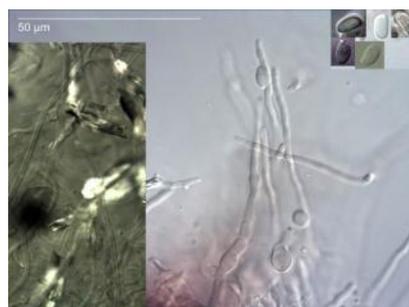
Notes: Cap 3-4 mm, drying tan, with short eccentric stem. Stem dextrinoid, with lageniform moniloid caulocystidia. Cap and gills not dextrinoid, Spores inamyloid. Cap surface a disorganised cutis with long fine thick-walled non-dextrinoid hairs. Cheilocystidia not seen. Clamped. Spores length  $\mu=6.9 \mu\text{m}$ ,  $\sigma=0.1$ , width  $\mu=3.9 \mu\text{m}$ ,  $\sigma=0.2$ ,  $Q \mu=1.8$ ,  $\sigma=0.1$ ,  $n=5$ . Superficially like *M. aff. tenuissimus*.



RR/418



RR/418



RR/418:left: cap hairs. right caulocystidia and spores.

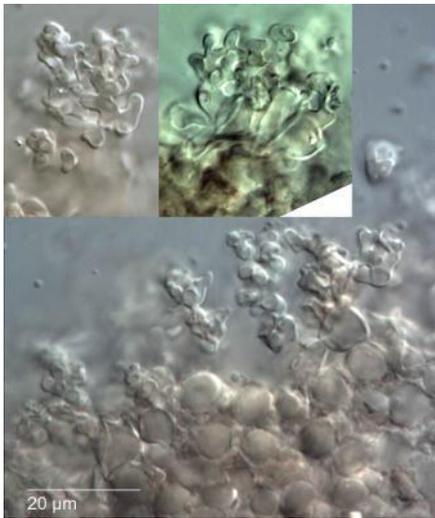
**Marasmiellus RR/340**

Material examined: RR/340, on/with *Dianella*, dead leaves, Site: Raemaru Tr, Plateau at summit, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 18/01/2005.

Notes: Cap to 5 mm. No tissue amyloid or dextrinoid. Cheilocystidia strongly ramealis. Hyphae clamped. Stipe slightly eccentric. Cap a loose cutis with weak extra-cellular encrustation. Caulocystidia like cheilocystidia. Stem hyphae thick-walled. Spores length  $\mu=7.7 \mu\text{m}$ ,  $\sigma=0.4$ , width  $\mu=4.3 \mu\text{m}$ ,  $\sigma=0.2$ ,  $Q \mu=1.8$ ,  $\sigma=0.1$ ,  $n=8$ . Section dealbati-quercini?



RR/340



RR/340:cheilocystidia



RR/340:cap hyphae



RR/340:caulocystidia and spores

**Marasmius** – 96 names used in the Pacific literature, none in the Cook Islands. More searching would probably turn up names for the Cook Island species listed below.

**Marasmius RR/074**

Material examined: RR/074, on/with *Homalium*, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: L. Dagenias, 01/12/2004.

Notes: Cap to 12mm diam., brown ridges, margin lobed, centre depressed, gills brown. Stem tissue dextrinoid. Cap a zebra-encrusted clamped cutis. 4-spored. Cheilocystidia basidiolar, brown encrusted. Gills arcuate. Spores inamyloid. Perhaps closer to *Gymnopus (Micromphale)*? See C. J. Bot. V70, 1992, p532



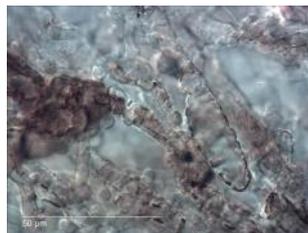
RR/074



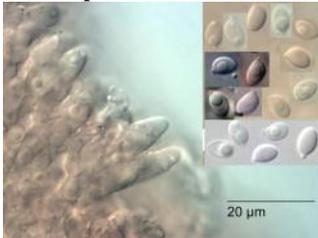
RR/074



RR/074:caulocystidia



RR/074:cap surface



RR/074:cheilocystidia and spores

***Marasmius aff. rotula***

Material examined: RR/437, litter and twigs, Site: Barringtonia remnant, on coast between Avarua and Matavera, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 23/01/2005.

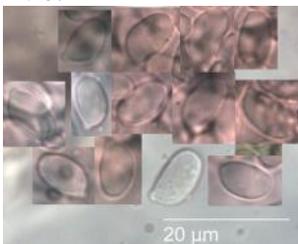
Notes: Cap 4-6 mm, gills forming a collar at the stem. Hyphae clamped. Cheilocystidia and cap rotalis. Spores length  $\mu=9.2$   $\mu\text{m}$ ,  $\sigma=0.7$ , width  $\mu=5.1$   $\mu\text{m}$ ,  $\sigma=0.3$ , Q  $\mu=1.8$ ,  $\sigma=0.1$ , n=13. *Marasmius* section marasmius. Epithet should be rotalis. Perhaps a bit too pigmented for this sensu stricto.



RR/437



RR/437



RR/437



RR/437:upper: cheilocystidia. Lower: cap.

***Marasmius aff. tenuissimus***

Material examined: RR/522, fallen twigs, Site: Raemaru Track, near 'unofficial' end, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 28/06/2005. RR/337, fallen wood, Site: Raemaru Tr, unofficial alternative route up valley, modified forest, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 18/01/2005.

Notes: Cap thin, papery, 15-25 mm, cream-brown, fold-like gills white, short lateral stipe. Cheilocystidia siccus. Cap similar, brown. Cap a hymeniderm. Gill tissue dextrinoid. Cap a hymeniderm with rotalis cells - Hygrometrici or Singer's neosessiles (for Desjardin = sicci/leonini). Hyphae clamped. Spores length  $\mu=9.0$   $\mu\text{m}$ ,  $\sigma=0.4$ , width  $\mu=5.6$   $\mu\text{m}$ ,  $\sigma=0.4$ , Q 1.6,  $\sigma=0.1$ , n=12. Near Horak's *M. unilamellatus* and Singer's *M. tenuissimus*, *M. spaniophyllus*, *M. sejunctus*, *M. neosessils*. Pileus trama is not dextrinoid., leading to *M. tenuissimus*. For Antonin (Africa) this would have narrower spores and darker cap. For Desjardin it would be bigger, have non-marginate gills (like this material). The name is invalid (non Schwein.)



RR/522

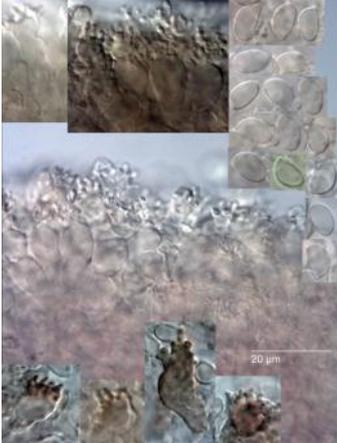


RR/522:upper spores and pilocystidia. lower cheilocystidia.





RR/337



RR/337:upper: cheilocystidia. Lower: cap; spores

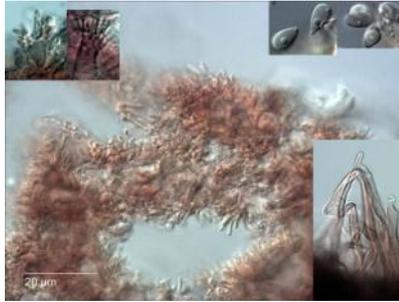
**Marasmius 'atorubentes series' RR/370**

Material examined RR/370, fallen twigs, Site: Te Kou track, disturbed forest near bottom, Rarotonga, Col.: P.R. Johnston, 19/01/2005.

Notes: All hyphal tissue dextrinoid. Cheilocystidia, pleurocystidia and cap siccus broom with fingers to 5um. Non-siccus pleurocystidia not seen, but siccus plentiful. No setae on gills or cap. 4-spored. Cap not hymeniderm (?). Stipe with basal mycelium mat. No collarium. Stipe pruinose with seta-like cystidia. Sect sicci ser atorubentes? (but that generally with dark cap, rather than leonini).



RR/370



RR/370:inset cheilo & pleuro siccus cystidia. Centre cap. Inset bottom right caulocystidia (x600 not x 1000)

**Marasmius RR/572+**

Material examined: RR/572, on/with *Angiopteris evecta*, dead fronds, Site: Cross Island walk, northern end, before stream, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 30/06/2005. RR/519, fallen twigs, Site: Raemaru Track, near 'unofficial' end, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 28/06/2005. RR/472, litter and twigs, Site: side of track to Avana water intake, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 25/01/2005. RR/369, fallen twigs, Site: Te Kou track, disturbed forest near bottom, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 19/01/2005. RR/419, dead wood, Site: Turangi Stream, track between road and water intake, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 22/01/2005. RR/589, fallen wood, Site: Cross Island walk, northern end, before stream, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 30/06/2005. RR/414, dead wood, Site: Turangi Stream, track between road and water intake, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 22/01/2005. RR/351, dead fern fronds, Site: Te Kou track, disturbed forest near bottom, Rarotonga, Col.: G. McCormak, Det.: J.A. Cooper, 19/01/2005.

Notes: Cap to 12mm diam., cap very pale brown, sulcate, gills white, widely spaced, decurrent, stem often darkening towards base. With brown resinous material on gill edge making it appear browner than gill face. Stem tissue strongly dextrinoid. Cap tissue dextrinoid, a finely diverticulate siccus hymeniderm. Hyphae clamped. cheilocystidia cylindrical, occasionally furcate. 4-spored, inamyloid. length  $\mu=13.9 \mu\text{m}$ ,  $\sigma=1.1$ , width  $\mu=4.2 \mu\text{m}$ ,  $\sigma=0.3$ ,  $Q \mu=3.4$ ,  $\sigma=0.2$ ,  $n=3$ . Spores length  $\mu=14.4 \mu\text{m}$ ,  $\sigma=0.8$ , width  $\mu=5.0 \mu\text{m}$ ,  $\sigma=0.3$ ,  $Q=2.9$ ,  $\sigma=0.2$   $n=9$ . It seems likely that a good name exists for this common species.



RR/572



RR/519



RR/472



RR/419



RR/472



RR/414



RR/369



RR/414:caulocystidia and inset cap surface



RR/369:cheilocystidia, spores, and cap



RR/414:spores and cheilocystidia



RR/419



RR/351

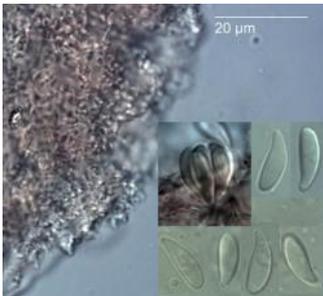
**Marasmius RR/572+(Pink)**

Material examined: RR/416, dead wood, Site: Turangi Stream, track between road and water intake, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 22/01/2005.

Notes: Cap 8-12 mm. Dried tan. Gill edge brown with resin. Cap tissue weakly dextrinoid. Clamped 4-spored. Cap ornamented. No caulocystidia. Stem tissue dextrinoid, without caulocystidia. Spores length  $\mu=13.3$ ,  $\sigma=1.1$ , width  $\mu=4.7$ ,  $\sigma=0.2$ , Q  $\mu=2.8$ ,  $\sigma=0.3$ , n=6. Although pink this is identical to RR414 - but may be different to other RR/572's?.



RR/416



RR/416:cap and spores



RR/416:resin on gill edge and cheilocystidia

**Melanotus** – 7 names used in the island literature all covered by Horak in his 1977 monograph of the group. None from the Cook Islands. *M. bruchii*, *communis*, *distinctus*, *flavolivens*, *horizontalis*, *insidiosus* (=hepatochrous), *protractus* of which *M. flavolivens* appears to have the broadest distribution.

**Melanotus aff. communis**

Material examined: RR/083, on/with *Inocarpus*, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: L. Dagenais, Det.: J.A. Cooper, 02/12/2004. RR/355, on/with *angiopteris*, 09/07/11

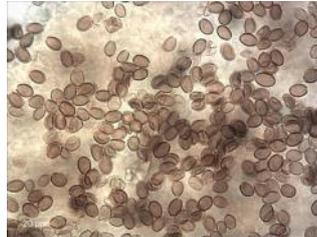
**Database Report**

dead fern fronds, Site: Te Kou track, disturbed forest near bottom, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 19/01/2005. RR/455, on/with *Inocarpus*, fallen nut husk, Site: side of track to Avana water intake, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 25/01/2005. RR/354, on/with *angiopteris*, dead fern fronds, Site: Te Kou track, disturbed forest near bottom, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 19/01/2005. RR/590, on/with *Angiopteris*, dead frond, Site: Cross Island walk, northern end, before stream, Rarotonga, Col.: P.R. Johnston, 30/06/2005.

Notes: Laterally attached, shell-shaped, to 16mm diam., with short lateral stipe. Top grey to dark grey, gills grey/purple. Tissue exuding oil/resin drops into KOH. Cap a clamped partially gelatinised cutis. Spores smooth with germ pore, thick-walled. Without pleurocystidia. With sterile gill edge, cheilocystidia cylindrical (but sometimes rare). Has short white tomentose stipe. 4-spored. length  $\mu=6.3$ ,  $\sigma=0.4$ , width  $\mu=4.3$ ,  $\sigma=0.2$ , Q  $\mu=1.4$ ,  $\sigma=0.1$ , n=20. Spores length  $\mu=6.7$ ,  $\sigma=0.4$ , width  $\mu=4.3$ ,  $\sigma=0.4$ , Q  $\mu=1.6$ ,  $\sigma=0.1$ , n=15. These collections have the micro-morphology of *M. communis* described from PNG, but in this material the cap is strongly coloured grey/purple.



RR/083



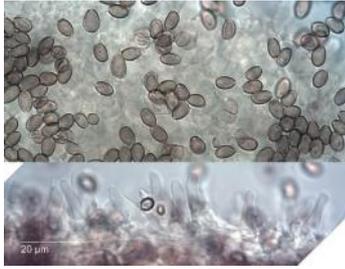
RR/083



RR/455



RR/455



RR/455:spores and cheilocystidia



RR/354



RR/354

*Microporus* – included as another example of a polypore

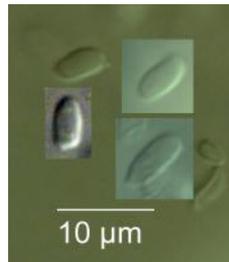
***Microporus* RR/016**

Material examined: RR/016, Doubtful identification, on/with *Albizia*, bark, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 17/11/2004. JAC11900, (RR/014), Doubtful record, on/with *Fitchia*, bark, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 17/11/2004.

Notes: length  $\mu=5.9 \mu\text{m}$ ,  $\sigma=0.5$ , width  $\mu=3.0 \mu\text{m}$ ,  $\sigma=0.2$ , Q  $\mu=2.0$ ,  $\sigma=0.1$ , n=4. Pores circular, 7 per mm. Cap glabrous. Unclamped. Context cream. No dark line.



RR/016



RR/016



RR/014

*Mycena* – 86 names used across the islands, including the luminescent *M. noctilucens* and *M. chlorophos*. None from the Cook Islands.

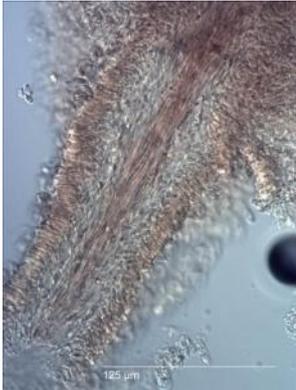
***Mycena* RR/528+**

Material examined: RR/528, on/with *Albizia*, fallen twigs, Site: Raemaru Track, below summit, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 28/06/2005. RR/368, fallen twigs, Site: Te Kou track, disturbed forest near bottom, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 19/01/2005.

Notes: Cap-12 mm diam. Cream with purple brown scaly centre. Small radiating basal hyphal pad. Gills distant, in series of 2, gill edge concolorous. Gills arcuate. Stem without caulocystidia, brown (not sure if dextrinoid, or just brown). Cap a partially gelatinised cutis. Pigment brown plasmatic, vesicles not apparent, but thinner darkly pigmented hyphae numerous. Pleurocystidia with brown encrustation, but these more common to gill edge. 4-spored. Spores amyloid (very finely ornamented?). Hymenium and central trama slightly dextrinoid. Spores length  $\mu=10.7 \mu\text{m}$ ,  $\sigma=0.7$ , width  $\mu=4.1 \mu\text{m}$ ,  $\sigma=0.4$ , Q  $\mu=2.6$ ,  $\sigma=0.2$ , n=13. Probably not an appropriate genus.



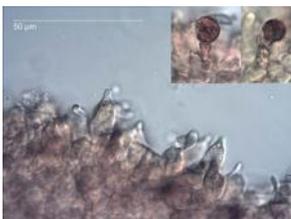
RR/528



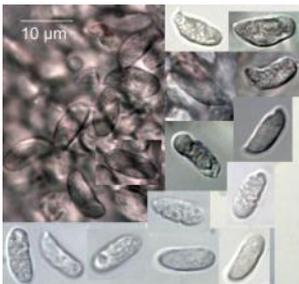
RR/528:trama (melzers)



RR/528:cap (inset detail at x1000) Melzers.



RR/528:cheilocystidia and pleurocystidia



RR/528:spores (melzers)



RR/368



RR/368

***Mycena RR/328***

Material examined: RR/328, on/with *coconut*, husk of fallen nut, Site: southern end cross-island walk, modified forest, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 17/01/2005.

Notes: Cap to 8 mm arising from a basal pad. Cap with ornamented elongate hyphae. This shows resemblance to NZ undescribed 'Perseverance Road (PDD87228)' and 'Rotokuru Lakes (PDD80841)'. Spores length  $\mu=8.2 \mu\text{m}$ ,  $\sigma=0.5$ , width  $\mu=4.2 \mu\text{m}$ ,  $\sigma=0.4$ , Q  $\mu=2.0$ ,  $\sigma=0.2$ , n=11



RR/328



RR/328



RR/328:cap surface and spores

***Mycena RR/331***

Material examined: RR/331, on/with *coconut*, shell, Site: Raemaru Tr, unofficial alternativr route up valley, modified forest, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 18/01/2005.

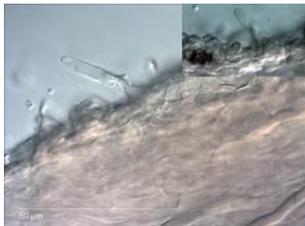
Notes: Cap to 18 mm. Dried orange brown. Cap gelatinised with occasional pilocystidia. Cheilocystidia plentiful, cylindrical, collapsing. spores length  $\mu=5.6 \mu\text{m}$ ,  $\sigma=0.2$ , width  $\mu=4.6 \mu\text{m}$ ,  $\sigma=0.2$ ,  $Q \mu=1.2$ ,  $\sigma=0.1$ ,  $n=4$



RR/331



RR/331



RR/331:section through cap



RR/331:spores, cheilocystidia

***Mycena***

Material examined: RR/470, litter and twigs, Site: side of track to Avana water intake, Rarotonga, Col.: P.R. Johnston, Det.: P.R. Johnston, 25/01/2005.

Notes: Cap 3-7 mm. Gill edge frosty with cystidia. Cheilocystidia filamentous. Gill tissue not dextrinoid. Stem dextrinoid, without caulocystidia. Spores weakly amyloid. Cap a confused cutis with brown plasmatic content (hydropid?). Clamps not seen. Probably not a *Mycena*.



RR/470



RR/470



RR/470:spores and cheilocystidia

**Oudemansiella** (inc. *Hymenopellis/Xerula*). 4 names used across the Pacific with *O. australis* and *canarii* most commonly recorded. *O. australis* is now considered (Petersen 2010) to be a later synonym of *O. apalosarcus* and separate to *O. canarii*.

***Oudemansiella canarii***

Material examined: RR/045, on/with *Hibiscus*, Site: Takitumu Conservation Area, Rarotonga, Col.: L. Dagenais, 23/11/2004. RR/012, bark, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 17/11/2004. RR/116a, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 20/12/2004.

Notes: Cap to 25mm diam, top white with grey centre, floccules, gills white. Gills dried orange. With large vesiculose cheilo & pleurocystidia, sometimes with small internal crystals. No tissue amyloid or dextrinoid. Spores massive, spherical. Gill with occasional thick-walled antler-like hyphae. Cap an ixocutis with a few thick-walled hairs, unclamped. Gills in rank of three. Trama parallel. 2-spored? Spores length  $\mu=21.0 \mu\text{m}$ ,  $\sigma=1.2$ , width  $\mu=20.3 \mu\text{m}$ ,  $\sigma=1.1$ ,  $Q \mu=1.0$ ,  $\sigma=0.0$ ,  $n=9$ .



RR/045:cheilocystidia



RR/045:cheilocystidia



RR/045



RR/045:cap squash



RR/045



RR/045:cheilocystidia



RR/045:section through cap surface

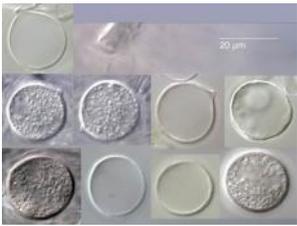
Database Report



RR/045:gill section



RR/045:gill trama



RR/045:spores (Melzers)



RR/012



RR/012



RR/116a

*Parasola auricoma*

Material examined: RR/471, stony soil, Site: side of track to Avana water intake, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 25/01/2005.

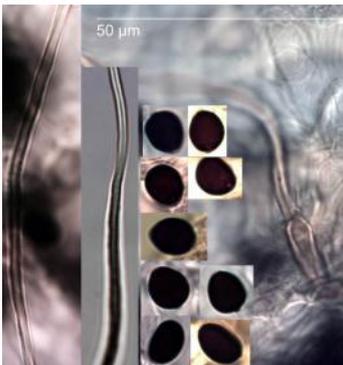
Notes: Cap 10-12 mm. See Desjardin's paper on Hawaii coprinoid taxa. spores length  $\mu=9.6 \mu\text{m}$ ,  $\sigma=0.4$ , width  $\mu=7.5 \mu\text{m}$ ,  $\sigma=0.3$ ,  $Q \mu=1.3$ ,  $\sigma=0.1$ ,  $n=5$



RR/471



RR/471



RR/471:cap hairs and spores

*Phaeosolenia* – *P. densa* and *P. inconspicua* recorded from the islands

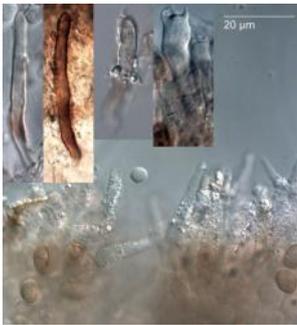
***Phaeosolenia densa***

Material examined: RR/417, bark of fallen wood, Site: Turangi Stream, track between road and water intake, Rarotonga, Col.: P.R. Johnston, 22/01/2005. RR/433, fallen wood, Site: Barringtonia remnant, on coast between Avarua and Matavera, Rarotonga, Col.: P.R. Johnston, 23/01/2005.

Notes: 0.8-1.5 mm cups. Disc pinkish brown, undersurface white furfuraceous. No subiculum. Hairs brown with white granules. Spores smooth, brown length  $\mu=8.2$ ,  $\sigma=0.6$ , width  $\mu=5.6$ ,  $\sigma=0.4$ , Q  $\mu=1.5$ ,  $\sigma=0.1$ , n=18



RR/417



RR/417:hairs, cystidia, basidium



RR/417:spores



RR/433



RR/433

*Pleurotus* – 41 names appearing in the Pacific literature. *Pleurotus australis* recorded from the Cook Islands previously.

***Pleurotus RR/501***

Material examined: RR/501, fallen wood, Site: grounds of Atiu Villas, Atiu,, Col.: P.R. Johnston, 22/06/2005.

Notes: Luminescent gills drying grey/orange. Cap tissue partially gelatinised. No tissue amyloid or dextrinoid. Spores clumping. With thick-walled hyphae. 2-spored? (needs confirmation). *Pleurotus lux* a luminescent species was recorded from Tahiti in 1892 but there have been no recent collections or studies of this taxon that I could locate. Morphologically similar to *P. australis*.



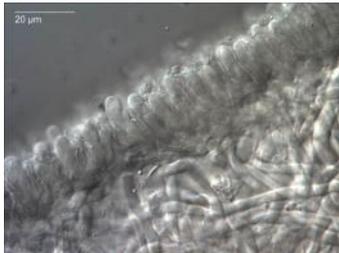
***Pleurotus djamor***

Material examined: RR/088, on/with *Cyclophyllum*, bark, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 03/12/2004. RR/040, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 22/11/2004. RR/587, decort wood, Site: Cross Island walk, near Te Rua Manga, Rarotonga, Col.: P.R. Johnston, 30/06/2005. RR/449, fallen tree, Site: Cross Island walk, northern end, before stream, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 24/01/2005. RR/551, bark of fallen wood, Site: Raemaru Track, below summit, Rarotonga, Col.: P.R. Johnston, 28/06/2005. RR/310, wood, Site: track to Ikurangi, in disturbed agricultural area near bottom, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 16/01/2005. RR/448, fallen tree, Site: Cross Island walk, northern end, before stream, Rarotonga,

Database Report

Col.: P.R. Johnston, Det.: J.A. Cooper, 24/01/2005. RR/018, on/with *Freycinetia*, bark, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 17/11/2004. RR/024, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 18/11/2004. JAC11847, (RR/044), on/with *Hibiscus*, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: L. Dagenais, 23/11/2004. RR/308, wood, Site: track to Ikurangi, just below the pines, Rarotonga, Col.: P.R. Johnston, Det.: J.A. Cooper, 16/01/2005. JAC11898, (RR/002), bark, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 15/11/2004. RR/117a, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 20/12/2004. RR/086, on/with *Hernandia*, wood, Site: TCA, Rarotonga, Col.: Ed Saul, 03/12/2004. RR/087, on/with *Freycinetia*, bark, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 03/12/2004. RR/588, decort wood, Site: Cross Island walk, up slope towards Te Rua Manga, Rarotonga, Col.: P.R. Johnston, 30/06/2005. RR/557, fallen wood, Site: Raemaru Track, below summit, Rarotonga, Col.: P.R. Johnston, 28/06/2005.

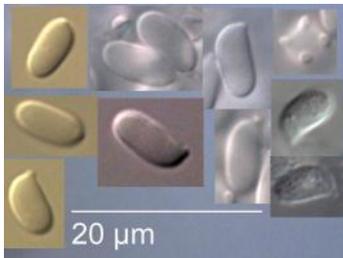
Notes: Cap grey brown cap to 35mm (-80), gills decurrent, with lateral short substipe. Cap a thick-walled clamped cutis, with numerous thick-walled hyphae. Cap with brown fibrils with extra-cellular pigmentation (not dextrinoid), fibrillose layer partially gelatinised. Cheilocystidia cylindrical, not distinguished. Rarely with strangulated apices (gloeosphex-like?). Gill edge basidia collapsing. No tissue amyloid or dextrinoid. With thick-walled hyphae near gill edge. Sequences confirm the placement of this species in *Pleurotus* despite the thick-walled hyphae. 4-spored.length  $\mu=7.4 \mu\text{m}$ ,  $\sigma=0.6$ , width  $\mu=3.6 \mu\text{m}$ ,  $\sigma=0.2$ , Q ( $\mu=2.1$ ,  $\sigma=0.1$ ,  $n=10$ ). This was by far the most commonly collected species in the Cook Islands – 17 collections examined.



RR/088:gill edge showing collapsed basidia/mucilage?



RR/088:cheilocystidia



RR/088:spores and basidium



RR/088:terminal elements of thick-walled hyphae in cap.



RR/449



RR/449



RR/587



RR/587



RR/551



RR/448



RR/551



RR/024



RR/310



RR/024



RR/448



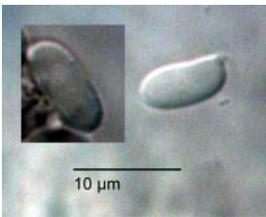
RR/308



RR/308



RR/086:cap structure



RR/086

*Pluteus* – pink spored species, mainly on wood. 10 names across the Islands, none from the Cook Islands.

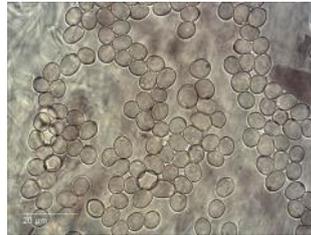
***Pluteus* RR/080**

Material examined: RR/080, on/with *Fitchia*, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: L. Dagenais, 02/12/2004.

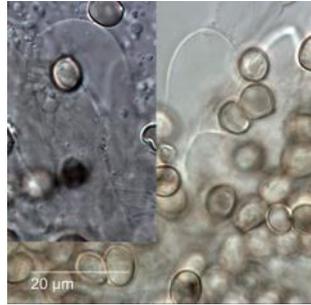
Notes: Cap to 44mm diam., top grey, gills pink, stalk white. Section *pluteus* with non-differentiated cutis with occasional brown vesicles and thick-walled pronged cystidia. Cap grey/brown. Gill edge concolorous. This is none of the NZ species having these pronged cystidia. Clamped - but hard to see - needed to squash stem tissue. Singer's section trichoderma, subsection *cervini*, stirps *subcervinus* in the region of *brunneodiscus/subcervinus*. According to Singer related species are *P. subcervinus*, *brunneodiscus*, *fibulatus*, *nigropallescens*, *mesosporus*, *shii* (and *brunneoradiatus*?). See Justo Mycotaxon v102 for a discussion of the group. This is not one of the described ones.



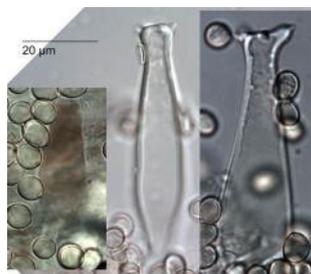
RR/080



RR/080



RR/080:cheilocystidia



RR/080:pleurocystidia and cap vesicles

*Psathyrella* – 12 names in the island literature

***Psathyrella* RR/042**

RR/042, on/with *Hibiscus*, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: L. Dagenais, 23/11/2004.

Notes: Cap to 2cm diam., top cream to brown, gills brown. Cap surface a hymeniderm. Spores brown, smooth, no germ pore. No pleurocystidia. No chrysocystidia. length  $\mu=9.3 \mu\text{m}$ ,  $\sigma=0.4$ , width  $\mu=5.9 \mu\text{m}$ ,  $\sigma=0.2$ ,  $Q \mu=1.6$ ,  $\sigma=0.1$ ,  $n=10$ .



RR/042



RR/042

*Psilocybe* – 13 names in the island literature.

*Psilocybe c.f. inquilina*

Material examined: RR/004, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: E. Saul, 15/11/2004.

Notes: Cap to 1 cm diam., top brown, gills brown. Stem with cream basal hyphae. Cap a cutis. Spores purple/brown, no chrysozystidia. Spores length  $\mu=7.4$ ,  $\mu\sigma=0.3$ , width  $\mu=4.6$   $\mu\sigma=0.3$ ,  $Q \mu=1.6$ ,  $\sigma=0.1$ ,  $n=18$ . Spores have pore-like thinning. Cheilocystidia very pale brown in KOH, spore wall < 0.3 $\mu\text{m}$ . No pleurocystidia. In the inquilina group.



RR/004



RR/004:cheilocystidia and spores

*Stemonitis* – a slime mould

*Stemonitis fusca*

RR/10, on/with *Homalium*, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: L. Dagenais, 16/12/2004.



RR/10

*Tremella* – a jelly fungus. 27 names used across the islands.

*Tremella fuciformis*

RR/030, wood, Site: Takitumu Conservation Area, Rarotonga, Col.: L. Dagenais, 22/11/2004.

Notes: One example of this often collected species. It is perhaps the most common and widely documented species across the islands

