

**A key to the buellioid lichens (Ascomycota, Caliciaceae) in New Zealand**

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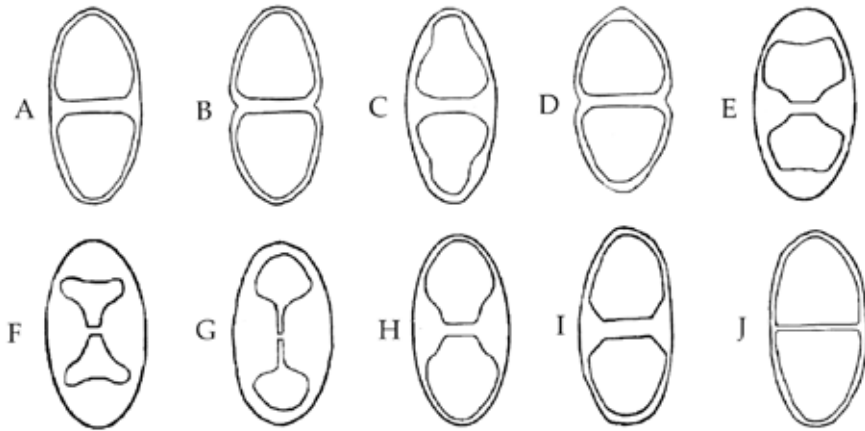
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**Abstract**

A key to the 106 taxa of buellioid lichens in New Zealand is provided. *Amandinea hnatiukii* Elix is reported for the first time from New Zealand

This paper continues our investigation of *Buellia*-like lichens in New Zealand, and follows from the previous accounts of *Buellia* and related genera (Elix 2015, 2016, 2017a, 2017b; Elix *et al.* 2015, 2017a, 2017b; Elix & Kantvilas 2016; Elix & Knight 2017; Elix & Mayrhofer 2016, 2017, 2018) and our additions and revisions to *Amandinea* (Blažič *et al.* 2016; Mayrhofer *et al.* 2016). Here, I provide a key to the 106 species and infraspecific taxa of buellioid lichens currently known from New Zealand. *Amandinea hnatiukii* Elix is reported for the first time from New Zealand.

**Keys to buellioid lichens in New Zealand**



Types of ascospore. A = *Buellia*-type; B = *Buellia*-type (constricted); C = *Callispora*-type; D = *Cratiria*-type; E = *Dirinaria*-type; F = *Mischoblastia*-type; G = *Orcularia*-type; H, I = *Physconia*-type; J = *Rinodinella*-type.

**Key A.** Species growing on bark, wood, soil or other lichens; lacking lichen substances [K-, C-, KC-, P-, UV-, TLC-]

**Key B.** Species growing on bark, wood, soil, grass, bryophytes or other lichens; containing lichen substances [positive test with one or more of K, C, KC, PD, UV, TLC]

**Key C.** Species growing on rock; lacking lichen substances [K-, C-, KC-, PD-, UV-, TLC-]

**Key D.** Species growing on rock; containing lichen substances [positive test with one or more of K, C, KC, PD, UV, TLC]

\* These species have been reported for New Zealand and are included in the key, although no authentic material has been seen by the author.

# These species have only been reported for New Zealand's subantarctic islands.

**Key A**

- 1 Thallus growing on bark or wood..... 2
- 1: Thallus growing on soil or other lichens ..... 14
- 2 Ascospores 3-septate or submuriform ..... **Diplotomma albostratum**
- 2: Ascospores 1-septate ..... 3
- 3 Ascospores *Orcularia*-type; conidia filiform, curved ..... 4
- 3: Ascospores *Physconia*-or *Buellia*-type; conidia various ..... 6
- 4 Ascospores initially *Orcularia*-type, then *Physconia*-type, 20–28 µm long ..... 4
- 4: Ascospores persistently *Orcularia*-type, 13–22 µm long ..... **Amandinea dudleyensis**#
- 5 Ascospores 10–[13.5]–16 × 5–[6.8]–8.5 µm ..... **Orcularia elixii**
- 5: Ascospores 11–[15.5]–22 × 6.5–[8.0]–10 µm ..... **Orcularia insperata**
- 6 Ascospores persistently *Buellia*-type ..... 7
- 6: Ascospores initially *Physconia*-type, then *Buellia*-type ..... 8
- 7 Ascospores 12–15 × 5–8 µm; conidia filiform, curved, 12–18 µm long ..... 7
- 7: Ascospores 16–30 × 7–12 µm; conidia bacilliform, straight, 5–6 µm long ..... **Amandinea punctata**
- ..... **Baculifera macromera**
- 8 Apothecia initially lecanorine, then biatorine or lecideine; conidia filiform, curved, 16–30 µm long ..... 9
- 8: Apothecia lecideine throughout ..... 10
- 9 Ascospores 14–21 × 6–9 µm; juvenile ascospore locules spherical... **Amandinea ornata**
- 9: Ascospores 10–17 × 5–8 µm; juvenile ascospore locules lachrymiform (tear-shaped) ..... **Amandinea ropinii**
- ..... **Amandinea ornata**
- 10 Epithymenium green to greenish black, K+ greenish, N+ purple-black or grey-black; conidia bacilliform, straight, 5–9 µm long ..... **Baculifera xylophila**
- 10: Epithymenium brown, K-, N-; conidia curved, filiform, 16–30 µm long ..... 11
- 11 Ascospores 17–25 × 7–12 µm ..... **Amandinea pillagaensis**
- 11: Ascospores 11–20 × 5–8 µm ..... 12
- 12 Thallus on wood; ascospores 13–20 µm long ..... **Amandinea lignicola** var. **australis**
- 12: Thallus on bark or wood; ascospores 11–16 µm long ..... 13
- 13 Subhymenium interspersed; locules of juvenile ascospores spherical ..... **Amandinea porulosa**
- 13: Subhymenium not interspersed; locules of juvenile ascospores clavate ..... **Amandinea extenuata**
- ..... **Amandinea extenuata**
- 14 Thallus growing on soil; ascospores 10–15 × 5–7 µm ..... **Buellia suttonensis**
- 14: Thallus growing on other lichens ..... 15
- 15 Ascospores 1-septate; growing on *Caloplaca* sp. .... 16
- 15: Ascospores 3-septate or submuriform ..... 17

16	Ascospores <i>Physconia</i> -type, then <i>Buellia</i> -type, 12–16 µm long; conidia bacilliform, straight, 4–5 µm long.....	<b>Buellia subadjuncta</b>
16:	Ascospores <i>Buellia</i> -type, 14–18 µm long; conidia filiform, curved, 16–20 µm long.....	<b>Amandinea adjuncta*</b>
17	Ascospores 3-septate, 8–12 × 4–5 µm; on <i>Thelotrema</i> sp.; Auckland Is.....	<b>Buellia thelotremicola#</b>
17:	Ascospores submuriform, 13–20 × 7–10 µm; on <i>Caloplaca</i> sp. or <i>Xanthoria elegans</i> ...	<b>Diplotomma nivale*</b>
<b>Key B</b>		
1	Thallus growing on bark or wood.....	2
1:	Thallus growing on grass, soil, bryophytes or other lichens.....	13
2	Ascospores 1–3-septate or submuriform.....	3
2:	Ascospores 1-septate.....	4
3	Ascospores submuriform; thallus sorediate, K+ red; norstictic acid present.....	
	.....	<b>Buellia griseovirens*</b>
3:	Ascospores 1–3-septate; thallus not sorediate, K+ yellow; atranorin present.....	
	.....	<b>Buellia billewiersii</b>
4	Thallus K+ red; norstictic acid present.....	5
4:	Thallus K–; norstictic acid absent.....	6
5	Hymenium densely interspersed with oil droplets; ascospores 26–34 µm long.....	
	.....	<b>Buellia subcrassata</b>
5:	Hymenium not interspersed with oil droplets; ascospores 12–18 µm long.....	
	.....	<b>Baculifera entochlora</b>
6	Upper surface yellow or yellow-grey; thallus C+ orange, UV+ orange; xanthonenes present..	7
6:	Upper surface whitish, grey to grey-brown; thallus C–, UV–; xanthonenes absent.....	10
7	Asci 16-spored; ascospores 9–12 × 4–5.5 µm.....	<b>Amandinea melaxanthella</b>
7:	Asci 8-spored.....	8
8	Ascospores 11–14 × 4.5–6 µm; arthothelin and thuringione present.....	
	.....	<b>Amandinea diorista</b> var. <b>hypopelidna</b>
8:	Ascospores 12–18 × 6–8 µm; thiophanic acid present.....	9
9	Thallus sorediate.....	<b>Gassicurtia jamesii</b>
9:	Thallus not sorediate.....	<b>Gassicurtia gallowayi</b>
10	Hymenium not interspersed with oil droplets; ascospores <i>Buellia</i> -type, 13–17 × 5–7 µm ..	
	.....	<b>Baculifera micromera</b>
10:	Hymenium densely interspersed with oil droplets; ascospores <i>Callispora</i> -type.....	11
11	Asci 3–4-spored.....	<b>Buellia tetrapla*</b>
11:	Asci usually 8-spored.....	12
12	Ascospores with strong subapical wall-thickenings; diploicin present.....	
	.....	<b>Buellia demutans*</b>
12:	Ascospores with weak subapical wall-thickenings; diploicin absent.....	
	.....	<b>Buellia disciformis</b>

13	Thallus bright yellow; growing on Pannariaceae; Campbell Is .	<b>Buellia campbelliana#</b>
13:	Thallus brown or pale yellow; growing on soil, grass or bryophytes.....	14
14	Thallus K+ yellow, UV–; atranorin present; ascospores 13–17 × 6–9 µm.....	
	.....	<b>Tetramelas kopuwaianus</b>
14:	Thallus K–, UV+ orange; 6- <i>O</i> -methylarthothelin present; ascospores 14–32 × 5–13 µm.....	15
15	Ascospores 14–25 × 5–7.5 µm.....	<b>Tetramelas confusus</b>
15:	Ascospores 23–32 × 8–13 µm.....	<b>Tetramelas insignis</b>

<b>Key C</b>		
1	Ascospores 3-septate or submuriform; on limestone.....	2
1:	Ascospores 1-septate; on limestone or siliceous rocks.....	3
2	Ascospores submuriform.....	<b>Diplotomma alboatrum</b>
2:	Ascospores 3-septate.....	<b>Diplotomma venustum*</b>
3	Upper surface granular-sorediate.....	<b>Buellia amandineaformis</b>
3:	Upper surface not sorediate.....	4
4	Thallus growing on limestone.....	<b>Buellia albula</b>
4:	Thallus growing on siliceous rocks.....	5
5	Thallus subsquamulose to squamulose.....	6
5:	Thallus crustose.....	7
6	Thallus initially lichenicolous; ascospores 10–15 µm long; conidia bacilliform, 3–5 µm long.....	<b>Monerolechia badia</b>
6:	Thallus never lichenicolous; ascospores 12–18 µm long; conidia curved, filiform, 20–30 µm long.....	<b>Amandinea isabellina</b>
7	Thallus epilithic.....	8
7:	Thallus endolithic, not apparent or with a few scattered, thalline flecks.....	33
8	Epihymenium aeruginose, N+ violet; on montane rocks.....	<b>Buellia epiaeruginosa</b>
8:	Epihymenium brown, N– or N+ greenish black then orange-brown.....	9
9	Ascospores with marked medial wall-thickenings, <i>Orcularia</i> to <i>Physconia</i> -type.....	10
9:	Ascospores without medial wall-thickenings, or with weak medial wall-thickenings during spore ontogeny, <i>Physconia</i> -then <i>Buellia</i> -type.....	13
10	Apothecia to 1 mm diam., often pruinose.....	11
10:	Apothecia to 0.6 mm diam., not pruinose.....	12
11	Ascospores 17–23 × 10–14 µm; subhymenium not interspersed; ± variolaric acid.....	
	.....	<b>Amandinea decedens</b>
11:	Ascospores 14–18 × 6–9 µm; subhymenium interspersed; ± SV-1.....	
	.....	<b>Amandinea variabilis</b>
12	Apothecia immersed; thallus cream-coloured to pale brown, weakly verrucose; ascospores 7.5–10 µm wide.....	<b>Amandinea otagensis</b>
12:	Apothecia broadly adnate; thallus dirty white to grey-brown, rimose-areolate; ascospores 6–8 µm wide.....	<b>Amandinea pelidna</b>

13	On montane rocks	14
13:	On coastal and lowland rocks	15
14	Medulla I+ blue; ascospores 15–26 × 8–14 μm	<b>Amandinea austroconiops</b>
14:	Medulla I–; ascospores 14–20 × 7–10 μm	<b>Amandinea isabellina</b>
15	Ascospores without medial wall-thickenings; ascospores 9–15 × 4–9 μm	16
15:	Ascospores with weak medial wall-thickening during spore ontogeny, but soon reduced	20
16	Conidia bacilliform, straight, 3–6 μm long	17
16:	Conidia filiform, curved, 12–30 μm long	19
17	Thallus lacking calcium oxalate [H <sub>2</sub> SO <sub>4</sub> –]	<b>Buellia suttonensis</b>
17:	Thallus containing calcium oxalate [H <sub>2</sub> SO <sub>4</sub> +]	18
18	Thallus thick, corticate, continuous	<b>Buellia cranwelliae</b>
18:	Thallus of scattered ecorticate areoles	<b>Buellia poolensis</b>
19	Mature ascospores not constricted at the septum; prothallus usually absent; conidia 12–18 μm long	<b>Amandinea punctata</b>
19:	Mature ascospores constricted at the septum; prothallus broad, marginal; conidia 20–30 μm long	<b>Amandinea prothallinata</b>
20	Ascospores 15–30 × 7–14 μm	21
20:	Ascospores 10–16 × 5–9 μm	28
21	Medulla I+ blue; ascospores 15–26 × 8–14 μm	<b>Amandinea austroconiops</b>
21:	Medulla I–; ascospores 15–22 × 8–12 μm	22
22	Conidia bacilliform, straight, 6–10 μm long; prothallus thick, black, dominant	<b>Buellia prothallina</b> #
22:	Conidia curved, filiform, 14–30 μm long; prothallus thin or absent	23
23	Mature ascospores not or only rarely constricted	24
23:	Mature ascospores commonly constricted at the septum	25
24	Thallus rimose-areolate; ascospores 14–[16.3]–20 × 7–[8.7]–12 μm; subhymenium interspersed	<b>Amandinea nitrophila</b>
24:	Thallus chinky; ascospores 15–[17.9]–22 × 8–[9.8]–13 μm; subhymenium not interspersed	<b>Amandinea subcervina</b>
25	Apothecial discs weakly grey-pruinose; subhymenium interspersed	<b>Amandinea hnatiuki</b> #
25:	Apothecial discs epruinose; subhymenium not interspersed	26
26	Thallus bullate-areolate to sublobate; apothecia broadly adnate; hypothecium brown	<b>Amandinea coniops</b>
26:	Thallus finely fissured or granular; apothecia immersed; hypothecium hyaline	27
27	Medulla containing calcium oxalate, H <sub>2</sub> SO <sub>4</sub> +; upper surface granular	<b>Amandinea antipodensis</b> #
27:	Medulla lacking calcium oxalate, H <sub>2</sub> SO <sub>4</sub> –; upper surface finely fissured	<b>Amandinea hypopallida</b> #

28	Ascospores 12–16 × 6–9 μm, elongate-ellipsoidal	29
28:	Ascospores 10–13 × 5–7 μm, broadly ellipsoidal	30
29	Mature ascospores often constricted at the septum; thallus thick, warty; prothallus absent; apothecia to 1.5 mm wide	<b>Amandinea litoralis</b>
29:	Mature ascospores not or very rarely constricted; thallus thin, rimose-areolate; prothallus often black and prominent; apothecia to 0.8 mm wide	<b>Amandinea fuscoatrata</b>
30	Ascospores constricted at the septum; apothecial disc epruinose; thallus lacking orange pigment	<b>Amandinea australasica</b>
30:	Ascospores not constricted; apothecial disc ± pruinose; thallus with or without orange pigment	31
31	Thallus absent or discontinuous, verruculose to granulose, white to pale orange; prothallus absent; thallus containing orange pigment	<b>Amandinea vitellina</b>
31:	Thallus rimose-areolate, continuous, grey to brown or dark brown; prothallus often present; thallus with or without orange pigment	32
32	Thallus brown or dark brown; prothallus often dark and prominent; disc epruinose; thallus lacking orange pigment	<b>Amandinea brunneola</b>
32:	Thallus white to pale grey; prothallus grey-white or not apparent; disc often grey-white-pruinose; thallus containing orange pigment	<b>Amandinea julianae</b>
33	Ascospores 12–16 × 5–10 μm	34
33:	Ascospores 8–14 × 3.5–7 μm	35
34	Ascospores persistently <i>Buellia</i> -type, 5–[6.6]–8 μm wide	<b>Amandinea punctata</b>
34:	Ascospores <i>Physconia</i> - then <i>Buellia</i> -type, 6–[7.9]–10 μm wide	<b>Amandinea discreta</b>
35	Thallus containing calcium oxalate [H <sub>2</sub> SO <sub>4</sub> +]	36
35:	Thallus lacking calcium oxalate [H <sub>2</sub> SO <sub>4</sub> –]	37
36	Ascospores 10–[12.0]–15 μm long	<b>Buellia poolensis</b>
36:	Ascospores 8–[10.5]–13 μm long	<b>Buellia austroabstracta</b>
37	Ascospores 3.5–[4.6]–6 μm wide, not constricted	<b>Buellia abstracta</b>
37:	Ascospores 5–[6.2]–8 μm wide, constricted or not	38
38	Ascospores not constricted; conidia curved, filiform, 15–25 μm long	<b>Amandinea vitellina</b>
38:	Ascospores often constricted; conidia straight, bacilliform, 3–6.5 μm long	<b>Buellia suttonensis</b>
<b>Key D</b>		
1	Ascospores 1–3-septate or submuriform	2
1:	Ascospores 1-septate	7
2	Epihymenium brown, N–	3
2:	Epihymenium aeruginose, N+ violet	5
3	Ascospores submuriform; thallus whitish	<b>Diplotomma chlorophaeum</b>
3:	Ascospores usually 1-septate, rarely 2–3-septate; thallus bright yellow	4
4	Ascospores 13–[17.1]–22 × 6–[8.5]–11 μm	<b>Tetramelas concinnus</b>
4:	Ascospores 19–[23.1]–30 × 7–[10.3]–13 μm	<b>Tetramelas allisoniae</b>

5	Ascospores 3-septate; thallus K+ yellow, C+ red; alectorialic acid present; montane.....	<b>Buellia alectorialica</b>
5:	Ascospores submuriform; thallus K-, C+ orange; isoarthothelin present; coastal.....	6
6	Ascospores 15–[19.5]–25 × 10–[11.8]–15 µm .....	<b>Buellia papanui</b>
6:	Ascospores 13–[16.2]–19 × 7–[9.1]–10.3 µm.....	<b>Buellia aeruginosa</b>
7	Thallus K+ red; norstictic acid present .....	8
7:	Thallus K-, K+ yellow or K+ pale orange-red; norstictic acid absent.....	21
8	Thallus growing on limestone.....	<b>Buellia albula</b>
8:	Thallus growing on siliceous rocks .....	9
9	Thallus endolithic and not apparent or consisting of fragmentary white flecks .....	10
9:	Thallus epilithic, more substantial.....	11
10	Thallus lacking calcium oxalate (H <sub>2</sub> SO <sub>4</sub> -).....	<b>Buellia northallina</b>
10:	Thallus containing calcium oxalate (H <sub>2</sub> SO <sub>4</sub> + ).....	<b>Buellia ferax</b>
11	Epihymenium aeruginose, N+ violet or purple-brown .....	12
11:	Epihymenium brown, N-.....	17
12	Medulla containing calcium oxalate, H <sub>2</sub> SO <sub>4</sub> +.....	13
12:	Medulla lacking calcium oxalate, H <sub>2</sub> SO <sub>4</sub> -.....	14
13	Apothecial discs epruinose .....	<b>Rinodinella fertilis</b>
13:	Apothecial discs white-pruinose.....	<b>Buellia kantvilasis</b>
14	Apothecia remaining immersed; atranorin absent .....	<b>Buellia aethalea</b>
14:	Apothecia superficial at maturity; atranorin present or absent.....	15
15	Subhymenium interspersed; atranorin absent .....	<b>Buellia patearoana</b>
15:	Subhymenium not interspersed; atranorin present.....	16
16	Ascospores 12–20 × 6–10 µm, commonly constricted at the septum .....	<b>Buellia homophylla</b>
16:	Ascospores 10–16 × 5–8 µm, rarely constricted.....	<b>Buellia spuria</b> var. <b>amblyogona</b>
17	Apothecia initially lecanorine or cryptolecanorine; ascospores <i>Buellia</i> -type.....	<b>Buellia haywardii</b>
17:	Apothecia lecideine .....	18
18	Ascospores <i>Buellia</i> -type .....	19
18:	Ascospores <i>Callispora</i> - then <i>Buellia</i> -type.....	20
19	Mature apothecia immersed; ascospores 14–20 × 6–8 µm; atranorin present.....	<b>Buellia austroalpina</b>
19:	Mature apothecia superficial; ascospores 10–16 × 5–7 µm; atranorin absent.....	<b>Buellia tuapekensis</b>
20	Ascospores 15–[18.4]–20 × 7–[9.3]–12 µm; atranorin absent; montane .....	<b>Buellia maungatuensis</b>
20:	Ascospores 15–[21.3]–25 × 8–[10.8]–13 µm; atranorin present; coastal .....	<b>Buellia akatorensis</b>

21	Thallus K+ yellow, UV-; atranorin .....	22
21:	Thallus K- or K+ pale orange-red; atranorin absent or present as traces only .....	35
22	Thallus placodioid, bullate-areolate or squamulose.....	23
22:	Thallus crustose .....	25
23	Thallus bullate-areolate to squamulose; xantholepinone A present.....	<b>Endohyalina arachniformis</b>
23:	Thallus placodioid; xantholepinone A absent.....	24
24	Buellolide and canseolide present.....	<b>Diploicia canescens</b> subsp. <b>australasica</b>
24:	Buellolide and canseolide absent.....	<b>Diploicia canescens</b> subsp. <b>canescens</b>
25	Thallus sorediate; apothecia cryptolecanorine, with pruinose discs .....	<b>Amandinea rangitensis</b>
25:	Thallus esorediate; apothecia lecideine, with epruinose discs .....	26
26	Ascospores 18–32 × 8–16 µm .....	27
26:	Ascospores 10–23 × 5–11 µm .....	28
27	Conidia filiform, curved, 18–31 µm long .....	<b>Amandinea subbadioatra</b>
27:	Conidia bacilliform, 4.5–7 µm long .....	<b>Buellia seppeltii</b>
28	Ascospores 10–16 × 5–8 µm .....	29
28:	Ascospores 15–23 × 7–11 µm .....	33
29	Excipulum and hypothecium K+ intense purple.....	<b>Buellia hypopurpurea</b>
29:	Excipulum and hypothecium K- .....	30
30	Thallus C+ orange, UV+ orange; xanthonones present .....	<b>Buellia subarenaria</b>
30:	Thallus C-, UV-; xanthonones absent .....	31
31	Thallus PD+ orange; stictic acid present .....	<b>Buellia spuria</b> var. <b>spuria</b>
31:	Thallus PD+ pale yellow; stictic acid absent.....	32
32	2'- <i>O</i> -Methylperlatolic and confluent acids absent .....	<b>Buellia stellulata</b> var. <b>tasmanica</b>
32:	2'- <i>O</i> -Methylperlatolic, ± confluent acids present.....	<b>Buellia stellulata</b> var. <b>stellulata</b>
33	Medulla lacking calcium oxalate, H <sub>2</sub> SO <sub>4</sub> -; Kermadec Is. ....	<b>Buellia insularicola</b>
33:	Medulla containing calcium oxalate, H <sub>2</sub> SO <sub>4</sub> + .....	34
34	Upper surface epruinose; hafellic acid present .....	<b>Buellia fallax</b>
34:	Upper surface pruinose; porphyritic acid present.....	<b>Buellia porphyrica</b>
35	Thallus K+ pale orange-red; hypostictic acid present.....	36
35:	Thallus K-, hypostictic acid absent.....	37
36	Apothecial discs grey-white-pruinose; conidia bacilliform.....	<b>Buellia hypostictella</b>
36:	Apothecial discs epruinose; conidia filiform .....	<b>Amandinea hypostictica</b>
37	Thallus C+ red, UV-; gyrophoric and ± 5- <i>O</i> -methylhiassic acids present.....	<b>Buellia poimeneae</b>
37:	Thallus C+ orange or C-, UV+ or UV-; gyrophoric and 5- <i>O</i> -methylhiassic acids absent.....	38

38	Ascospores <i>Dirinaria</i> -type.....	39
38:	Ascospores <i>Buellia</i> -type or <i>Physconia</i> -type.....	40
39	Thallus autonomous; hymenium densely interspersed with oil droplets; prothallus black, marginal; diploicin and xantholepinone A present.....	<b>Endohyalina arachniformis</b>
39:	Thallus lichenicolous on <i>Lecanora</i> sp.; hymenium not interspersed; diploicin present, xantholepinone A absent.....	<b>Endohyalina insularis</b>
40	Thallus C+ orange, UV+ orange; xanthonenes present.....	41
40:	Thallus C–, UV–; variolaric acid present.....	52
41	Upper surface pustulate-sorediate in part; apothecia immersed, cryptolecanorine.....	<b>Buellia malcolmii</b>
41:	Upper surface esorediate; apothecia adnate to sessile, lecideine.....	42
42	Medulla containing calcium oxalate, H <sub>2</sub> SO <sub>4</sub> +.....	43
42:	Medulla lacking calcium oxalate, H <sub>2</sub> SO <sub>4</sub> –.....	45
43	Epihymenium N+ violet; arthothelin present; on siliceous rocks.....	<b>Buellia halonioides</b>
43:	Epihymenium brown, N–; arthothelin present or absent; on limestone or siliceous rocks.....	44
44	Ascospores 16–24 × 9–14 μm; arthothelin present; on limestone.....	<b>Buellia georgei</b>
44:	Ascospores 11–20 × 6–10 μm; 2,5,7-trichloro-3- <i>O</i> -methylnorlichexanthone present; on siliceous rocks.....	<b>Buellia alutacea</b>
45	Medulla I+ blue-violet.....	46
45:	Medulla I–.....	49
46	Epihymenium aeruginose, N+ violet.....	47
46:	Epihymenium brown, N–.....	48
47	Ascospores 10–[13.8]–18 μm long; 6- <i>O</i> -methylarthothelin present..	<b>Buellia macveanii</b>
47:	Ascospores 10–[12.4]–14 μm long; arthothelin present.....	<b>Buellia sharpiana</b>
48	Ascospores 13–[17.1]–22 × 6–[8.5]–11 μm.....	<b>Tetramelas concinnus</b>
48:	Ascospores 19–[23.1]–30 × 7–[10.3]–13 μm.....	<b>Tetramelas allisoniae</b>
49	Ascospores <i>Buellia</i> -type; discs epruinose; subhymenium greenish.....	50
49:	Ascospores <i>Physconia</i> -type; discs often pruinose; subhymenium pale brown.....	51
50	Ascospores 11–[12.4]–15 × 5–[5.8]–7 μm.....	<b>Buellia straminea</b>
50:	Ascospores 12–[15.1]–20 × 7–[9.3]–11 μm.....	<b>Buellia ocellata</b>
51	Thallus rimose-areolate; epihymenium N+ violet; arthothelin present... <b>Buellia halonia</b>	
51:	Thallus verrucose-areolate; areoles convex; epihymenium brown, N–; 2,5,7-trichloro-3- <i>O</i> -methylnorlichexanthone present.....	<b>Buellia subarenaria</b>
52	Medulla I+ blue; ascospores <i>Physconia</i> - then <i>Buellia</i> -type, 14–18 × 7–10 μm.....	<b>Amandinea okainensis</b>
52:	Medulla I–; ascospores <i>Orcularia</i> - then <i>Physconia</i> -type, 17–23 × 10–14 μm.....	<b>Amandinea decedens</b>

## New record for New Zealand

**Amandinea hnatiukii** Elix, *Australas. Lichenol.* **81**, 6 (2017)

This species was previously known from Macquarie Island (Elix 2017a). It is characterized by the crustose, rimose to rimose-areolate, off-white to pale grey thallus, the interspersed subhymenium, ± white- to pale grey-pruinose discs, the *Physconia*- then *Buellia*-type ascospores, 15–[18.4]–25 × 8–[9.5]–12 μm, that are dilated at the septum in early ontogeny but become constricted at the septum with age and have a microrugulate outer wall, curved, filiform conidia, 16–25 × 0.7–1 μm, and by the lack of lichen substances. Illustrations and a detailed description are provided in Elix (2017a).

## SPECIMENS EXAMINED

New Zealand: *Campbell Island*: ● N side of base of Courrejolles Peninsula, on ledges of molly-mawk rookery, *H.A. Imshaug 46302*, 30.xii.1969 (MSC); ● W side of Monument Harbour, on rocks along shore, *H.A. Imshaug 46694 pr.p.*, 8.i.1970 (MSC).

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