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Strigula delicata is an endemic New Zealand foliicole that colonizes the living leaves of several trees and shrubs, among them tawa (*Beilschmiedia tawa*) and titoki (*Alectryon excelsus*). The heavily branched thallus often forms a miniature network, with perithecia dotted here and there on thallose islands at the tips of the lobes. Because the thallus is subcuticular, its spread sometimes is halted by prominent veins in the host leaf, as seen in both of these close-up images.

1 mm 

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**New species of *Gassicurtia* and *Stigmatochroma*
(Physciaceae, Ascomycota) from Queensland, Australia**

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Abstract

Gassicurtia blencoensis Elix, *G. capricornica* Elix and *Stigmatochroma maccarthyi* Elix are described as new to science. In addition, *Amandinea efflorescens* var. *pseudohypopelidna* is reported for the first time for Australia.

This paper is a continuation of investigations into *Buellia*-like lichens in Australia, following on from the first accounts of *Buellia* and related genera (Elix 2009, 2011, 2015b, 2016; Elix & Kantvilas 2013b, 2014a, 2015) and revisions to *Amandinea* (Elix & Kantvilas 2013a, 2016), *Baculifera* (Elix & Kantvilas 2014b), *Cratiria* (Elix 2014) and *Monerolechia* (Elix 2015a). In this paper I describe further new species of *Gassicurtia* and *Stigmatochroma*. Methods are as described in the papers cited above.

The new species

1. *Gassicurtia blencoensis* Elix, sp. nov.
MycoBank number: **MB 816605**

Fig. 1

Similar to *Gassicurtia coccinoides*, but differs in having an isidiate upper surface and larger ascospores.

Type: Australia, Queensland, Kennedy North district, Blencoe Creek, Cardwell Range, 48 km NW of Cardwell, 18°03'S, 145°39'E, 740 m alt., on canopy branches of felled tree in Lauraceae-*Syzygium-Prunus*-dominated forest, J.A. Elix 20085, 17.vii.1986 (CANB – holotype; BRI – isotype).

Thallus crustose, continuous, verrucose to isidiate, white to yellow-white or pale tan, to 35 mm wide; isidia cylindrical but soon becoming coralloid and dominating the thallus, to 1 mm high, 0.05–0.08 mm diam.; prothallus not apparent; photobiont cells 8–12 µm wide; medulla in part intense red, K+ crimson, I-. *Apothecia* 0.4–2 mm wide, lecideine, scattered or crowded, ±round, broadly adnate to sessile and constricted at the base; disc black, epruinose, weakly concave to plane or weakly convex, becoming undulate and tuberculate with age; proper exciple distinct, glossy, black, initially elevated above disc, excluded in older convex apothecia, in section 45–55 µm thick, the outer part dark olive-brown, K-, paler within. *Hypothecium* brown to brown-black, 150–180 µm thick, K-, N+ orange-brown. *Epithymenium* 8–10 µm thick, brown to dark olive-brown, K-. *Hymenium* 50–65 µm thick, colourless, interspersed with small oil droplets; subhymenium 50–70 µm thick, pale olive-brown; paraphyses 1.5–2.0 µm wide, simple to sparsely branched, with brown caps, the apices to 3 µm wide; *asci* of the *Bacidia*-type, with 8 or fewer spores. *Ascospores* of the *Buellia*-type, 1-septate, brown, narrowly ellipsoid, 11–[14.7]–20 × 4–[5.6]–7 µm, ±constricted at the septum; outer spore-wall smooth to finely ornamented. *Pycnidia* not seen.

Chemistry: Cortex K-, C-, P-, UV+ orange; medulla K+ crimson; containing 4,5-dichlor-olichexanthone (major), chiodectonic acid (minor) and an unknown secalonic acid derivative (major).

Etymology: The specific epithet is derived from the type locality.

Notes

Morphologically, the new species resembles *Gassicurtia elizae* (Tuck.) Marbach, in that both have thalli with a coralloid-isidiate upper surface and similar sized, *Buellia*-type ascospores. However, the isidia of *G. elizae* are minute and granular-coralloid (0.05–0.1 mm high), whereas those of *G. blencoensis* are much better-developed (non-granular, to 1 mm high). In addition, the medulla of *G. elizae* lacks red pigments (that of *G. blencoensis* contains chiodectonic acid), although the epihymenium of *G. elizae* contains an amorphous orange pigment (soluble in K, yielding an orange-red solution), and the discs are red-pruinose. Furthermore, *G. elizae* contains barbatic and obtusatic acids, substances not present in *G. blencoensis*. Chemically, *G. blencoensis* closely resembles *G. coccinoides* Marbach, a corticolous montane-tropical species known from the Caribbean, South America and East Africa (Marbach 2000). Both species are characterized by the presence of 4,5-dichlorolichexanthone, chiodectonic acid and unknown secalonic acid derivatives, but *G. coccinoides* contains additional boryquinone, is granular rather than coralloid-isidiate, and has smaller ascospores, 9–11(–12) × 3.5–4.5(–5) μm. In addition, *G. coccinoides* differs in having a brown-black hypothecium and subhypothecium containing a red, K+ violet pigment and a brown-black excipulum that gives a yellow-green solution in C (C– in *G. blencoensis*).

At present, the new species is known only from the type locality. Associated species include *Coccocarpia palmicola* (Spreng.) Arv. & D.J.Galloway, *Myelorhiza jenjiana* Verdon & Elix, *Parmeliella nigrocincta* (Mont.) Müll.Arg., *Usnea baileyi* (Stirt.) Zahlbr. and *Varicellaria velata* (Turner) Schmitt & Lumbsch.

2. *Gassicurtia capricornica* Elix, sp. nov.

Fig. 2

Mycobank number: **MB 816606**

Similar to *Gassicurtia nordinii* Kalb & Elix, but differs in having shorter ascospores and in containing norstictic and connorstictic acids in addition to chiodectonic acid.

Type: Australia, Queensland, 8 km E of Mount Morgan, 23°29'S, 150°28'E, 340 m alt., on dead tree in low monsoon scrub grazed by cattle, on gentle slope, *J.A. Elix 34648C*, 26.viii.1993 (holotype – CANB).

Thallus crustose, continuous, smooth to verruculose or granular in part, white to pinkish white, to 10 mm wide; prothallus prominent, black, in part surrounding the thallus; photobiont cells 7–12 μm wide; medulla white in part, intense red in part (K+ crimson), I–. *Apothecia* 0.1–0.4 mm wide, lecideine, scattered, round, immersed then broadly adnate; disc black, epruinose, plane; proper exciple thick, persistent, black, raised above the disc, in section 50–60 μm thick, outer part brown-black, K–, paler brown within. *Hypothecium* 120–160 μm thick, dark brown, K+ yellow then forming red, needle-like crystals. *Epihymenium* 12–14 μm thick, dark brown, K–. *Hymenium* 100–120 μm thick, colourless, not interspersed but with oil paraphyses; subhymenium pale brown, 25–30 μm thick; paraphyses 1.5–2.0 μm wide, simple to sparsely branched subapically, apices 3–4 μm wide, with brown caps; *asci* of the *Bacidia*-type, 8-spored. *Ascospores* usually 3-septate, rarely of the *Buellia*-type and 1-septate, brown, ellipsoid, 13–[15.6]–19 × 5–[6.4]–8 μm, not constricted at the septum; outer spore-wall smooth. *Pycnidia* not seen.

Chemistry: Cortex K–, C–, KC+ orange, P–, UV–; containing norstictic acid (major), connorstictic acid (minor) and chiodectonic acid (minor).

Etymology: The specific epithet reflects the distribution of the species (the federal electorate of Capricornia).

Notes

Morphologically, the new species closely resembles *Gassicurtia nordinii*, a corticolous montane-tropical species known from Réunion (Kalb *et al.* 2009). Both species are characterized by having 3-septate ascospores, but *G. nordinii* has longer spores, (17–23 versus 13–19 μm), and lacks an intensely red medulla and oil paraphyses in the hymenium. Also, *G. nordinii* contains barbatic acid and 2-chlorolichexanthone rather than the norstictic and connorstictic acids of *G. capricornica*. *Gassicurtia capricornica* is also similar to *Buellia rubroreagens* A.Nordin, a tropical species from Brazil and the Caribbean. However, *Buellia rubroreagens* has 3-septate ascospores and an excipulum and hypothecium that contain a yellow, K+ reddish pigment (Nordin 2000), but it lacks oil paraphyses in its hymenium. Also, *B. rubroreagens* lacks thalline pigments, and has longer ascospores, 19–[21.6]–25 × 6.5–[7.1]–8 μm.

At present, the new species is known only from the type locality. Associated species include *Buellia bahiana* Malme, *Dirinaria sekikaica* Elix, *Haematomma africanum* (J.Steiner) C.W.Dodge, *Lecanora tropica* Zahlbr., *Pertusaria thiospoda* C.Knight and *P. thwaitesii* Müll.Arg.

3. *Stigmatochroma maccarthyi* Elix, sp. nov.

Figs 3 and 4

Mycobank number: **MB 816607**

Similar to *Stigmatochroma metaleptodes* (Nyl.) Marbach, but differs in having asci containing up to 16 smaller ascospores.

Type: Australia, Queensland, Magnetic Island, Picnic Bay, track to Hawkings Point Lookout, 19°10'40"S, 146°50'39"E, c. 55 m alt., on trunk of moderately sheltered track-side tree, *P.M. McCarthy 4469*, 21.viii.2014 (holotype – CANB).

Thallus crustose, rimose-areolate, pale yellow-grey to yellow-green, continuous, 1–2 cm wide, esorediate; individual areoles contiguous, 0.1–0.3 mm wide and up to 0.05 mm thick; upper surface minutely verruculose to granular; prothallus black, marginal, 0.1–0.5 mm wide; medulla with angular crystals soluble in K, I–; photobiont cells 7–11 μm diam. *Apothecia* 0.1–0.5 mm wide, common, lecideine, broadly adnate to sessile; disc black, densely white- or yellow-pruinose, weakly concave to more or less flat; proper exciple black, distinct, raised above the disc, persistent, in section 30–50 μm thick, outer zone dark brown, K+ deep orange-red with the formation of red, needle-like crystals, inner zone yellow. *Epihymenium* 10–15 μm thick, yellow-green to pale olive-brown, K–, N–, with angular crystals that dissolve in K. *Hypothecium* 50–125 μm thick, dark brown, pigmented yellow-orange, K+ deep orange with the formation of red, needle-like crystals. *Hymenium* 75–85 μm thick, colourless, not interspersed; subhymenium 35–50 μm thick, pale brown to brown, not interspersed; paraphyses 1.5–1.7 μm wide, simple to sparsely branched, apices 3–3.5 μm wide with colourless caps; asci of the *Bacidia*-type, (8–)16-spored. *Ascospores* of the *Buellia*-type, 1-septate, olive-green to brown, ellipsoid, 10–[12.8]–16 × 4–[4.9]–6 μm, ±curved, becoming constricted with age; outer spore-wall finely ornamented. *Pycnidia* not seen.

Chemistry: Thallus K+ yellow then red, P+ orange, C+ orange, UV+ orange; containing norstictic acid (major), connorstictic acid (minor), thiophanic acid (minor).

Etymology: The species is named in honour of the collector, my colleague and friend Dr Patrick McCarthy.

Remarks

Stigmatochroma maccarthyi is a distinctive species, readily recognized by the yellow-grey to yellow-green, UV+ orange crustose thallus, the sessile apothecia with white- or yellow-pruinose, UV+ orange discs, the K+ orange-red excipulum and hypothecium, the mainly 16-spored asci and the presence of norstictic and thiophanic acids.

Superficially, it resembles *Stigmatochroma metaleptodes*, which has similar chemistry but differs in having a yellow-pigmented hypothecium that reacts K+ purple, 8-spored asci and larger ascospores, 16–21 × 6.5–9 µm. *Stigmatochroma adauca* (Malme) Marbach has 16-spored asci similar to those of *S. macarthyi*, but that species differs chemically in having a grey-white, UV– thallus, pruinose discs that are UV+ bright yellow (traces of lichexanthone) and contains atranorin, norstictic acid and pigmentosin derivatives (Marbach 2000).

At present the new species is known only from the type collection. Associated species include *Anthracothecium* aff. *toowoombense* (Müll.Arg.) Aptroot, *Buellia bahiana* Malme, *Lecanora helva* Stizenb., *L. kauaiensis* H.Magn., *Pertusaria thiospoda* C.Knight and several species of *Pyrenula*.

New record

Amandinea efflorescens* var. *pseudohypopelidna Marbach, *Biblioth. Lichenol.* **74**, 64 (2000)
This taxon was previously known from New Caledonia. It is characterized by the yellow-green crustose thallus with a sorediate upper surface, small lecideine apothecia, 0.3–0.4 mm wide, with epruinose discs, *Buellia*-type ascospores, 10–15 × 4.5–6.5 µm with strongly ornamented outer walls, and the presence of arthothelin (major), thuringione (major), 3-*O*-methylthiophanic acid (minor) and thiophanic acid (trace). A detailed description is given in Marbach (2000).

SPECIMENS EXAMINED

Queensland: • Mt Archer Environmental Park, 8 km NE of Rockhampton, 23°20'S, 150°34'E, 780 m alt., on dead wood in dry sclerophyll forest on moderately steep slope, J.A. Elix 34493, 24.viii.1993 (CANB).

New South Wales: • Washpool National Park, Gibraltar Range, Hakea Walk, 78 km E of Glen Innes, 29°28'10"S, 152°21'01"E, 895 m alt., on dead tree in mixed rainforest with scattered *Eucalyptus*, J.A. Elix 37278, 2.v.2005 (CANB).

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Figure 1. *Gassicurtia blencoensis* (holotype in CANB). Scale = 1 mm.



Figures 3 and 4. *Stigmatochroma macCarthyi* (holotype in CANB). Scale = 1 mm.



Figure 2. *Gassicurtia capricornica* (holotype in CANB). Scale = 1 mm.