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Corrections to reports of buellioid lichens from New Zealand's subantarctic islands, including *Sclerococcum thelotrematicola* comb. nov. and *Epilichen scabrosus* new to the Southern Hemisphere

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Corrections to reports of buellioid lichens from New Zealand's subantarctic islands, including *Sclerococcum thelotrematicola* comb. nov. and *Epilichen scabrosus* new to the Southern Hemisphere.

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**Abstract**

The type, and only, collections of *Buellia campbelliana* Elix and *Buellia thelotrematicola* Elix are shown to be referable to *Epilichen scabrosus* (Ach.) Clem. and *Sclerococcum*, respectively. *Epilichen scabrosus* is here reported for the first time from the Southern Hemisphere. The new combination *Sclerococcum thelotrematicola* (Elix) Fryday is made, and the host species is shown to be *Gintarasia lamellifera*. The report of *Buellia sharpiana* Lendemer & R.C.Harris from New Zealand is also re-assessed.

**Introduction**

The herbarium of Michigan State University (MSC) holds a large collection of lichens from New Zealand (mostly from the subantarctic islands), which were collected by Henry Imshaug and Richard Harris between 1969 and 1972 (Fryday & Prather 2001). As part of a revision of buellioid lichen in Australasia, 72 collections provisionally assigned to *Buellia* s. lat. were sent on loan to John (Jack) Elix (CANB) who examined and annotated all these collections, describing five new species (Elix 2017, 2018) and adding several new records for New Zealand. However, inspection of the type specimens of the two lichenicolous species described by Elix upon their return to MSC has shown that they have been mis-interpreted and are, in fact, referable to genera other than *Buellia*. Elix also identified a collection from South Island as *Buellia sharpiana*, which is otherwise known only from a single locality in the Appalachian Mountains of eastern North America.

***Buellia campbelliana*** Elix, *Australas. Lichenol.* **82**, 60 (2018)

The specimen from Campbell Island agrees morphologically in all respects with Northern Hemisphere specimens of *Epilichen scabrosus* (Ach.) Clem. Excellent descriptions of that species are already present in the literature (Gilbert & Hawksworth 2009; McCune 2017), and images are available online, so those are not included here. The only apparent difference from Northern Hemisphere collections is the reported chemistry. Elix (2018) reported 2-*O*-methylsekikaic acid (major) and usnic acid (minor), whereas Northern Hemisphere collections are said to contain pulvinic acid derivatives (Hafellner 1978). However, comparative tic of the Campbell Island collection with two collections from North America (Fryday 8161, Weber S 7147 - see below) and a specimen of the same exsiccata number as that tested by Leuckert (*Plant. Graec. Lich.* 21) revealed an almost identical chemistry in all four samples (Fig. 1). The chemistry is currently under investigation by the author and Prof. Elix, and will be reported on in due course.

Elix (2018) reported the host species as an undetermined *Cladonia* with a dull, grey-brown squamulose thallus containing the stictic acid chemosyndrome, but the thallus is an areolate crust with occasional marginal lobes and almost certainly represents a species of *Baeomyces* Pers., which is the usual host for *E. scabrosus*. The only species of *Baeomyces* reported from New Zealand is *B. heterophyllus* Nyl. ex C. Bab & Mitt., but that contains norstictic acid. The present lichen more closely resembles *B. rufus* (Huds.) Rebert., which has been reported from Tasmania (Kantvilas *et al.* 2012), but without ascomata that determination must remain provisional.

***Epilichen scabrosus*** (Ach.) Clem., *Gen. Fung.* (Minneapolis) 174 (1909)  
*Lecidea scabrosa* Ach., *Methodus*, Sectio prior (Stockholmia) 48 (1803); *Buellia scabrosa* (Ach.) A.Massal., *Geneac. Lich.* (Verona) 20 (1854).  
*Buellia campbelliana* Elix *syn. nov.*, *Australas. Lichenol.* **82**, 60 (2018).

SPECIMENS EXAMINED

*Buellia campbelliana* Elix: **New Zealand**. • Campbell Island, cliffs and shingle feldmark at summit of Mt. Fizeau (1655 ft.), *H.A. Imshaug* 46790, 10.i.1970 (holotype – MSC0101815).  
*Epilichen scabrosus* (Ach.) Clem.: **Austria**. • *Steiermark*, Ostalpen, Schladminger Tauern, Kleinsölk-Obertal, zwischen Putzenalm und Prebertörl, 1940 m, *J. Hafellner*, 9.viii.1975, (WIS — *Plant. Graeceneses Lich.* 21). **U.S.A. Alaska**. • Denali Natl Park, NW slope to summit of Mt. Eielson, 63° 25'N, 150° 20'W, 3,500 – 5,500 ft, moist tundra, *W.A. Weber*, 25.vii.1956 (S 7147) & *L.A. Viereck* (MSC); • North Slope Borough, Atkasuk, disused airstrip, on *Baeomyces carneus* on compacted soil, *A.M. Fryday* 8161, 12.vii.2001 (MSC).

***Buellia sharpiana*** Lendemer & R.C.Harris, *Castanea* **78**, 148 (2013)

Elix & Knight (2017) reported *B. sharpiana* as new to New Zealand from a single collection made by Richard Harris from a grassy roadside hillside on South Island in 1973 (see below). *Buellia sharpiana* is a narrow endemic species that was described from a single mountain summit in Great Smoky Mountains National Park in the southern Appalachian Mountains of eastern North America. The rock outcrops at the type locality are at an altitude of 1920 m and of Precambrian age (>500 mybp), belonging to the Anakeesta Formation, which is characterized by iron sulfide-rich slate, shale, and sandstone that weathers to a rusty brown colour and hosts a distinctive community of crustose lichens including heavy-metal-tolerant species such as *Acarospora sinopica* (Wahlenb.) Körb. and *Rhizocarpon oederi* (Weber) Körb. (Lendemer & Harris 2013). The locality of the collection reported by Elix & Knight (2017) is given as “Grassy hillside on north side of Route 73 along Craigieburn River”, but other collections in MSC which were made at the same time are more specific, giving it as “at junction of Craigieburn River and Route 73” which puts it at an altitude of c. 675 m. The rock of this area is Torlesse greywacke (sedimentary sandstone and mudstone) of early Cretaceous age (100–150 mybp; Reznichenko 2012). There is no visual indication that iron sulfide or any other heavy metal is present in the substratum of the *Buellia*. Nor is this suggested by the other species collected at the site (*Cladia aggregata* aggr., *Cladonia capitellata*, *C. pleurota*, *Lecanora epibryon* subsp. *broccha*, *Placopsis perrugosa*, *Stereocaulon ramulosum*), which are all widespread in New Zealand. Although intercontinental disjunct distributions are relatively frequent in lichenized-fungi — for example, see *Epilichen scabrosus* above — the fact that *B. sharpiana* is otherwise known from only a single locality 13,700 km away on a different continent in ecologically different circumstances casts doubt on the determination of the New Zealand collection.

The New Zealand collection resembles *B. sharpiana* in having a thallus containing arthothelin and an amyloid (I+ blue) medulla but whereas *B. sharpiana* has a brown to yellow thallus reacting KC+ orange-red and UV+ dull orange, the thallus of the New Zealand collection is grey and KC and UV– (Fig. 2A–B). The apothecia of *B. sharpiana* are also consistently innate with a hyaline, poorly differentiated exciple whereas the apothecia of the New Zealand collection become sessile upon maturity with a well-developed blue-black (N+ red) exciple c. 50 µm wide (Fig. 2E).. The New Zealand collection also differs in the dilute brown hypothecium (hyaline in *B. sharpiana*) and slightly larger ascospores (Fig. 2C–E).

In spite of the similarities between the New Zealand collection and *B. sharpiana*, the differences are significant, and *B. sharpiana* should be removed from the New Zealand lichen checklist.

SPECIMENS EXAMINED

*Buellia sharpiana* Lendemer & R.C. Harris (all NY): **U.S.A.** • *Tennessee*, Sevier Co., Great Smoky Mountains National Park, Myrtle Point, c. 0.3 mi E of the summit of Mt LeConte, 35.6533°–83.4317°, 6482 ft [1976 m] alt., open Anakeesta rock outcrop with spruce (*Picea*) – fir (*Abies*) forest including *Rhododendron*, *Vaccinium* and *Sorbus*, *J.L. Allen* 3966, 28.ix.2014; • *ibid.*, Myrtle Point to summit of Mt. LeConte, 35.653239°–83.431689°, 1991 m alt., boreal forest intermixed with exposed rocks (Anakeesta Formation) *Abies fraseri*, *Picea rubens*, *Sorbus americana*, *Rhododendron catawbiense*, *Rhododendron minus*, *Leiophyllum buxifolium*, *E.A. Tripp* 5015, 5920, 28.ix.2014; • *ibid.*, summit area of Mt. LeConte, Bullhead Trail, 5–6.8 mi from

parking area on Cherokee Orchard Road, cliff tops, and 0–2 mi on Rainbow Falls Trail from summit, 35.6769°–83.4481°, *Abies-Picea-Betula alleghaniensis-Sorbus-Acer spicatum-Sambucus* forest with exposed Anakeesta outcrops covered with *Rhododendron minus*, E.A. Tripp 2168A, 2214, 9.x.2011, (topotypes).

*Buellia* sp. **New Zealand** [Canterbury]. • Malvern County, grassy hillside on north side of Route 73 along the Craigieburn River, [43° 8.270' S, 171° 45.525' E, 675 m alt.], R.C. Harris 6433, 24.i.1971 (MSC).

***Buellia thelotrematicola*** Elix, *Australas. Lichenol.* **82**, 61 (2018)

The specimen from Auckland Island is clearly a species of the lichenicolous genus *Sclerococcum* (Fig. 3), which was recently shown to be the correct name for *Dactylospora* Körb. (Diederich *et al.* 2018). It closely resembles *Sclerococcum parasiticum* (Flörke) Diederich & Ertz, which occurs on the thallus of species of *Ochrolechia* and *Pertusaria* (Hafellner 1979, 2004). *Sclerococcum parasiticum* has previously been reported from New Zealand (Galloway 2007) from a single collection made by William Colenso (as *Lecidea parasitica* Flörke; Nylander 1888), but because the host of the present species is not closely related to *Ochrolechia* and *Pertusaria* (Pertusariales), it appears prudent to maintain the Auckland Island collection as a distinct species, and the necessary new combination is made below.

Elix (2018) reported the host of his new species as *Thelotrema* sp., presumably because Imshaug had annotated the packet “parasitic on *Thelotrema concentricum*”. However, *Thelotrema concentricum* was Imshaug’s working (unpublished) name for the species later described as *Chroodiscus lamelliferus* Kantvilas & Vězda (Kantvilas & Vězda 2000), for which the current name is *Gintarasia lamellifera* (Kantvilas & Vězda) Kraichak, Lücking & Lumbsch (Kraichak *et al.* 2013).

#### SPECIMENS EXAMINED

***Sclerococcum thelotrematicola*** (Elix) Fryday comb. nov.

Mycobank No.: **MB 829598**

Basionym: *Buellia thelotrematicola* Elix (as ‘*thelotremicola*’), *Australas. Lichenol.* **82**, 61 (2018). *Type*: New Zealand, Auckland Islands, Auckland Island, west arm of Musgrave Harbour, east of Fleming Plateau, 28 December 1972, H.A. Imshaug 57066 (holotype – MSC0110627).

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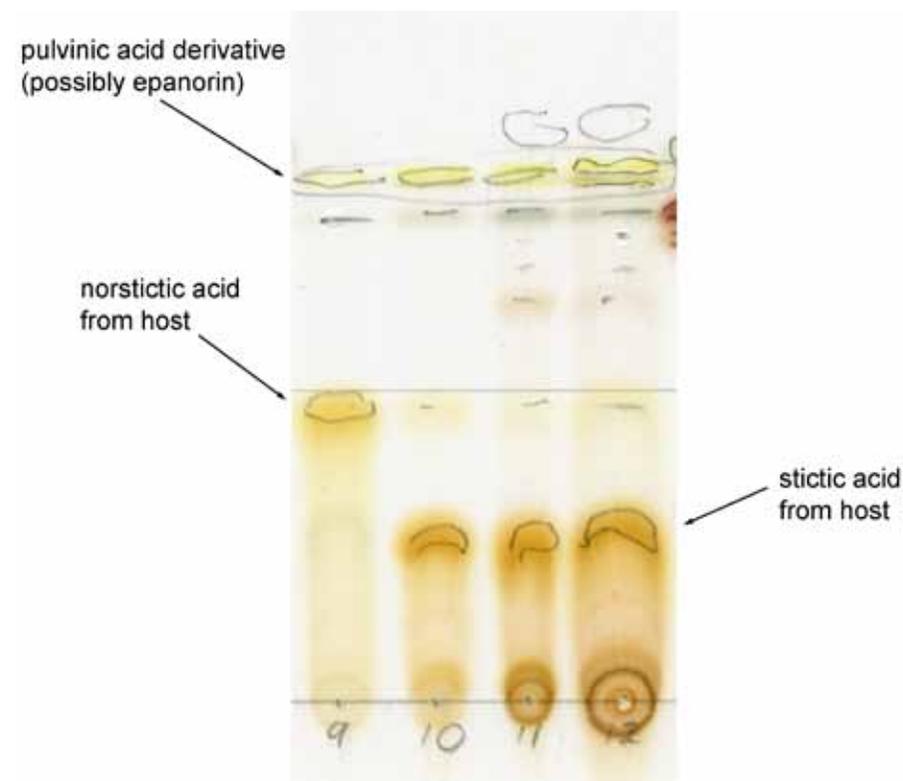


Figure 1: thin-layer chromatography plate (solvent C: toluene 200; acetic acid 30).

- 9: *Epilichen scabrosus* (Fryday 8161)  
 10: *Epilichen scabrosus* (Plant. Graec. Lich. 21)  
 11: *Buellia campbelliana*  
 12: *Epilichen scabrosus* (Weber S 7147).

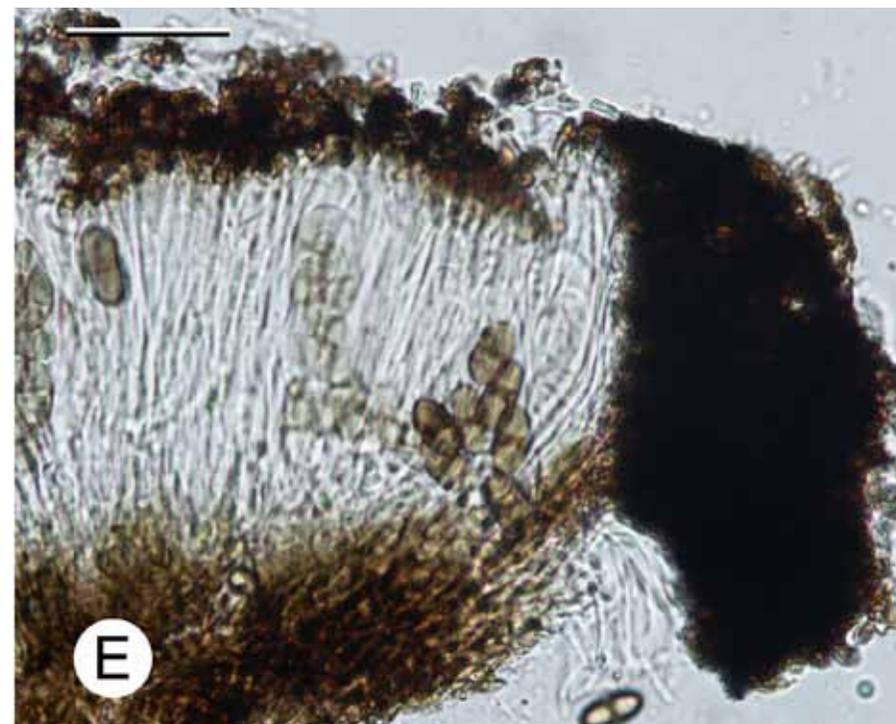
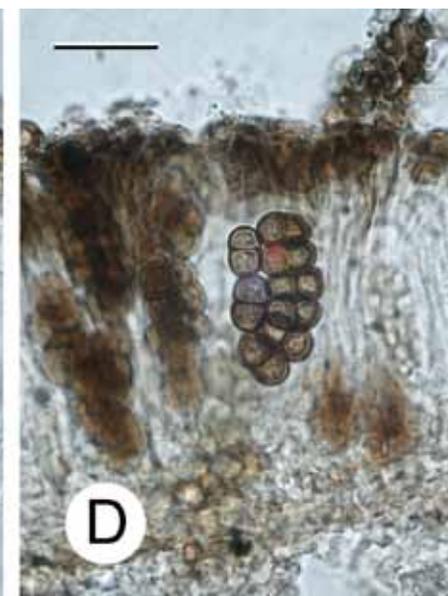
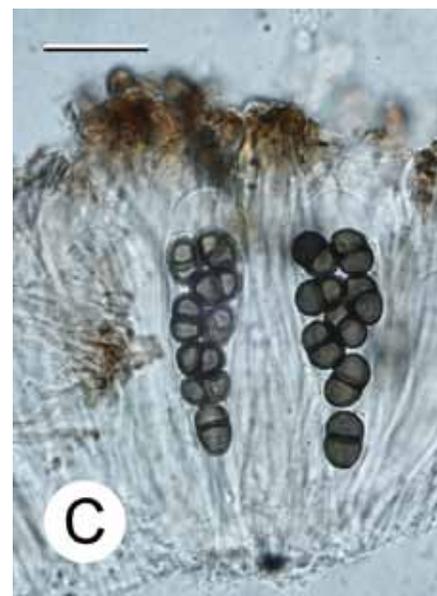
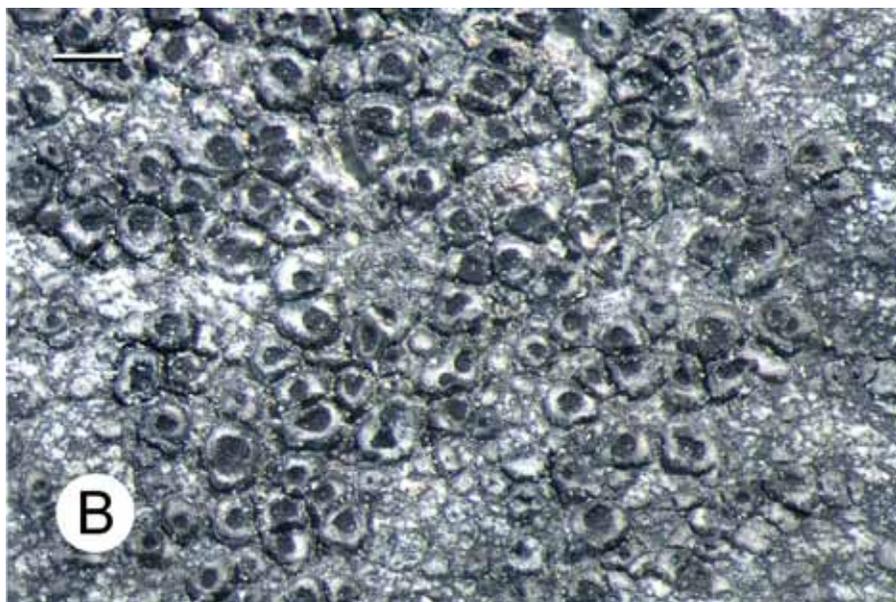
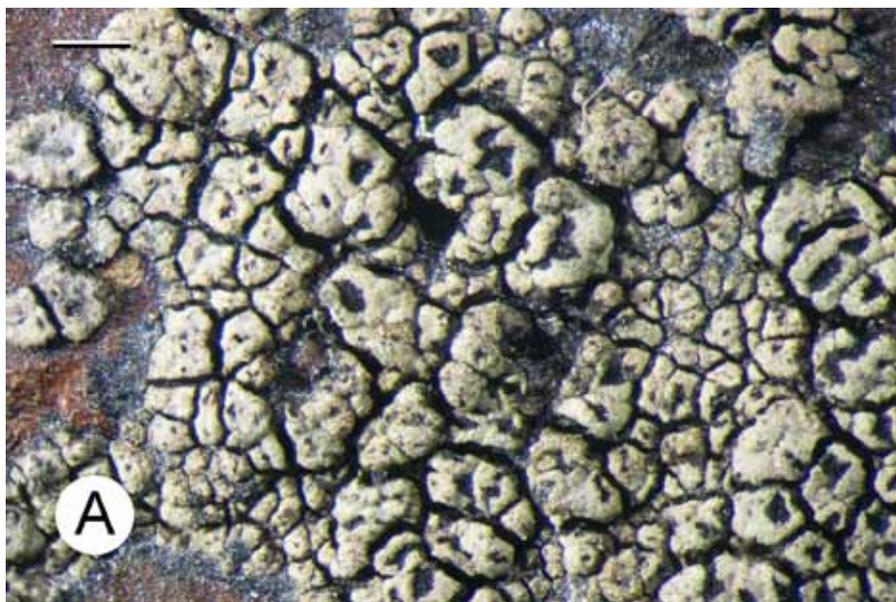


Figure 2: *Buellia sharpiana* and *Buellia* sp. A & C, *B. sharpiana* (Allen 3396); B, D–E, *Buellia* sp. (Harris 6433). Scale bars: A–B = 0.5 mm; C–E = 25  $\mu$ m.

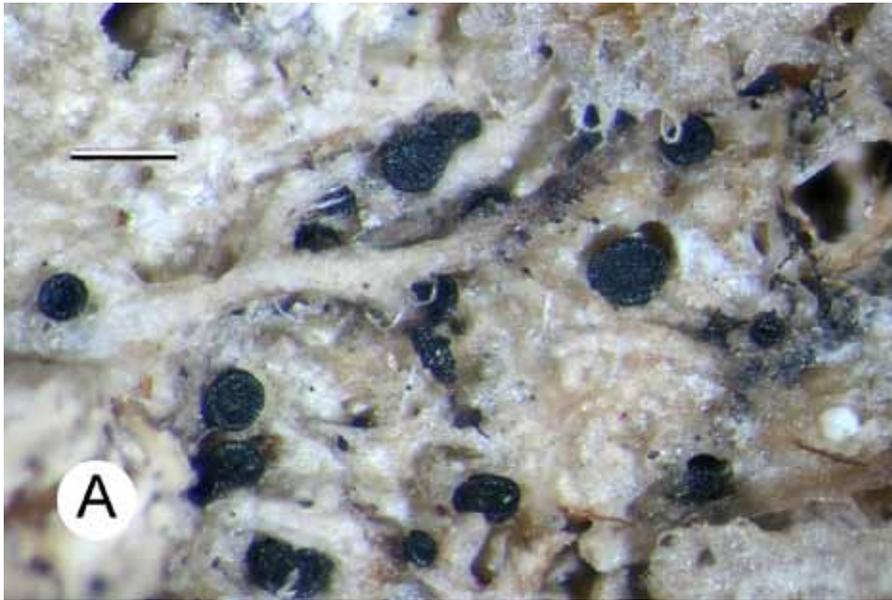


Figure 3: *Sclerococcum thelotrematicola* (Imshaug 57066 – holotype). A. Apothecia. B: Ascospores. Scale bars: A = 1.0 mm: B = 25  $\mu$ m.