A NEW SPECIES AND NEW RECORDS FROM THE TASMANIAN LICHEN FLORA

by

GINTARAS KANTVILAS[1] & JOHN A. ELIX[2]

ABSTRACT

Kantvilas, Gintaras & Elix, John A. A new species and new records from the Tasmanian lichen flora. *Muelleria* 7(4): 507–517 (1992). — A new lichen from Tasmania and South Australia, *Neofuscelia subloxodella* Elix & Kantvilas, is described. Twenty-three additional lichen taxa are reported from Tasmania for the first time, and notes on their distinguishing features, distribution and ecology are provided. The new combination, *Parmelina pseudorelicina* (Jatta) Kantvilas & Elix, is proposed.

INTRODUCTION

Since the publication of the last inventory of Tasmanian lichens (Kantvilas 1989), floristic, ecological and taxonomic research on the flora has continued, resulting in many additions and alterations to the Tasmanian census. In the present paper, we describe a new terricolous species in the genus *Neofuscelia* and report twenty-three lichen taxa from Tasmania for the first time. Included are the first Tasmanian records for the genera *Candelaria*, *Erioderma*, *Graphina*, *Imshaugia*, *Parmeliopsis*, *Tomasellia* and *Zahlbrucknerella*.

METHODS

The study is based primarily on collections in the Tasmanian Herbarium supplemented by material from some other herbaria. For all taxa, determinations are based on comparisons with type and/or reliably identified reference material and, where appropriate, personal communication with specialists in their respective groups (see acknowledgements). Anatomical and chemical investigations follow standard methods.

THE SPECIES

1. **Arthopyrenia anisoloba** Müll. Arg., *Flora* 66: 305 (1883).

Thallus very thin, effuse, scurfy, UV−. *Perithecia* scattered, black, hemispherical, 0.2–0.3 mm wide. *Asci* 8-spored, cylindrical, 60–80 × 16–20 µm, with a short, broad, flattened ocular chamber. *Spores* ovate, hyaline, unequally 1-septate (10)–12–19 × (4–) 5–8 µm. *Paraphyses* slender, persistent, anastamosing, *c.* 0.8 µm thick.

With its 1-septate, ovate spores, *A. anisoloba* appears to belong to the Section *Anisomeridium* (see Müller 1883, Coppins 1988: 306) and will ultimately require transferring to another genus (A. Aptroot pers. comm.). However, at present *Arthopyrenia s.lat.* in Tasmania remains very poorly known, both at generic and species level, although a large number of taxa have been collected. *A. anisoloba* is an inconspicuous species, known in Tasmania from several widely scattered localities in cool temperate rainforest. It occurs on the smooth bark of *Atherosperma*, *Nothofagus*, *Phyllocladus* and *Lagarostrobos* in deeply shaded habitats, and

[1] Gintaras Kantvilas, Tasmanian Herbarium, G.P.O. Box 252C, Hobart, Tasmania, 7001 Australia.
[2] John A. Elix, Department of Chemistry, Australian National University, P.O. Box 4, Canberra, ACT, 2601 Australia.

associated lichens include *Phlyctis subuncinata*, *Arthothelium ilicinum*, *Bacidia weymouthii*, *Thelotrema lepadinum* and species of *Arthonia* and *Pyrenula*. *Arthopyrenia anisoloba* was orginally described from Brazil.

SPECIMENS EXAMINED:

Tasmania — Weindorfers Forest, Waldheim, 920 m, 9 February 1988, *G. Kantvilas 19/88* (HO,NY,LSU); Badger Creek, *c.* 2.5 km south of Greystone Bluff, 280 m, 17 February 1989, *G. Kantvilas 71/89* (HO); Anthony Road, 560 m, 16 December 1988, *G. Kantvilas 568/88* (HO); Five Road, Florentine Valley, 450 m, 10 April 1981, *G. Kantvilas 231/81* (HO,BM). Approximately 3 km south of Teepookana, 220 m, 7 November 1990, *G. Kantvilas* 671/90 (HO).

2. **Arthothelium ampliatum** (Knight & Mitten) Müll. Arg., *Bull. Herb. Boissier 2*, App. 1: 85 (1894). — *Arthonia ampliata* Knight & Mitten, *Trans. Linn. Soc. Lond.* 23: 106 (1860).

Arthothelium ampliatum is characterised by its distinctive spores, 30–37 × 10–14 µm, with a muriform tail and markedly enlarged, undivided, terminal cell (see Kantvilas 1990 for description, discussion and illustration). It is apparently uncommon in Tasmania where it has been recorded from the bark of *Pomaderris* in wet sclerophyll forest. The species is also known from New South Wales, New Zealand and Victoria.

SPECIMENS EXAMINED:

Tasmania — Maria Island, 1.5 km north west of Mt Maria, 350 m, 11 March 1981, *G. Kantvilas 167/81* (HO); Strickland Avenue near Hobart, 180 m, 4 August 1906, *W.A. Weymouth 968* (HO).

3. **Candelaria concolor** (Dickson) B. Stein *in* Cohn, *Krypt. Fl. Schlesien* 2: 84 (1879). — *Lichen concolor* Dickson, *Fasc. pl. cryptog. brit.* 3: 18 (1793).

Candelaria concolor is a widespread cosmopolitan lichen, recognised by its citrine yellow to yellow-green, K− thallus with minute lobes and marginal soredia (see Galloway 1985 for full description). In mainland Australia, this species is particularly abundant on exotic trees, but in Tasmania it is quite uncommon and known currently only from sandstone outcrops in dry sclerophyll forest. Apothecia are unknown in Tasmanian specimens.

SPECIMENS EXAMINED:

Tasmania — Old Beach Road opposite Cadburys, 50 m, 5 February 1984, *G. Kantvilas & P. James 283/84* (HO,BM); Hunting Grounds, Dysart, 400 m, 7 August 1981, *G. Kantvilas 485/81* (HO,BM).

4. **Cladonia macilenta** Hoffm., *Deutchl. Fl.* 2: 126 (1796).

Despite misapplication of its name in the past, this species is now confirmed in Tasmania. It is apparently rare in the State and occurs on sandy soil in dry sclerophyll forest. *C. macilenta* is characterised by red-fruited, mainly ecorticate, farinose sorediate podetia and a chemistry comprising barbatic acid, ± didymic, thamnolic, squamatic or consquamatic acids (Archer 1988). Tasmanian specimens contain barbatic and thamnolic acids only, and occur together with *C. floerkeana*, a closely related species with rough, corticate podetia.

SPECIMENS EXAMINED:

Tasmania — Taylors Tier, *c.* 2 km south-east of Pelham, 340 m, 20 October 1990, *G. Kantvilas & J. Jarman 341/90* (HO); same locality, 20 February 1991, *G. Kantvilas & J. Jarman 8/91* (HO); Bluff Road, *c.* 5 km north-east of Tanina Bluff, 20 February 1991, *G. Kantvilas & J. Jarman 1/91, 2/91* (HO).

5. **Cladonia neozelandica** Vainio, *Acta Soc. Faun. Fl. fenn.* 10: 34 (1894).

Tasmanian specimens of *Cladonia* consisting entirely of basal squamules and containing atranorin only are here identified as *C. neozelandica* [see Galloway

(1985) for full description and Archer & Bartlett (1986) for diagnostic characters]. This species is most easily confused with *C. sulcata* which also occurs frequently as mats of squamules lacking podetia. However, the squamules of *C. neozelandica* tend to be mostly < 2 mm long and noticeably smaller than those of *C. sulcata* which, in variety *wilsonii*, can be up to 10 — 15 mm long. Chemistry provides the most reliable means of identification:

> *C. sulcata* contains bourgeanic acid in addition to atranorin (Archer & Bartlett 1986), with var. *wilsonii* also containing stictic acid, var. *sulcata* containing psoromic acid and var. *striata* (not present in Tasmania) containing norstictic acid.

There are also some ecological differences:

> *C. neozelandica* has been recorded from dry sclerophyll forest whilst *C. sulcata* occurs mostly in high rainfall areas, var. *sulcata* being mostly subalpine to alpine.

SPECIMENS EXAMINED:

Tasmania — Prosser River, sea level, 23 October 1980, *G. Kantvilas 313/80* (HO,BM); Sepentine Hill, 280 m, 26 September 1986, *G. Kantvilas s.n.* (HO).

6. **Degelia duplomarginata** (P. James & Henssen) Arvidsson & Galloway, *Lichenologist* 13: 39 (1981). — *Parmeliella duplomarginata* P. James & Henssen, *Mycotaxon* 11: 221 (1980).

Degelia duplomarginata is a distinctive species, distinguished from others in the genus by the presence of lobules in the centre of the thallus which coalesce and form a secondary thalline margin around the apothecia (see Henssen & James 1980, Arvidsson & Galloway 1981). Known from New Zealand, South America and Hawaii (Jørgensen & James 1990), this species is rare in Tasmania and has been recorded from a single locality only. It occurred on the canopy limbs of *Atherosperma moschatum* in cool temperate rainforest, associated with typical canopy species from the genera *Hypogymnia*, *Menegazzia*, *Parmelia* and *Usnea*. It is thus ecologically distinct from its nearest relative, *Degelia gayana*, which occurs mainly in wet heathland and scrub at forest margins, and which associates mostly with cyanophilic species of Lobariaceae and Pannariaceae.

SPECIMEN EXAMINED:

Tasmania — Meander Forest Reserve, 680 m, 13 May 1990, *G. Kantvilas 219/90* (HO,BM).

7. **Erioderma sorediatum** D. Galloway & P.M. Jørg., *Lichenologist* 7: 139 (1975).

Erioderma sorediatum is a palaeotropical species characterised by involute lobes which are greyish brown when dry, blue-grey when wet, and by a tomentose upper surface, whitish ecorticate lower surface and abundant bluish granular soredia on the lower surface, especially at the lobe margins (see Galloway & Jørgensen 1975 for complete description). The Tasmanian specimen is atypical, with rather larger than usual, cuneate lobes to *c.* 1–1.5 cm wide, almost completely lacks tufted rhizines on the lower surface, contains eriodermin and reacts Pd + faint orange; it nevertheless falls within the range of variation of this species (P.M. Jørgensen pers. comm.).

Tiny juvenile thalli of this taxon have been noted in Tasmania in the past, but the material was never sufficient to confirm the identification until now. *E. sorediatum* occurs in a very diverse, distinctive association of cyanophilic lichens found in very wet areas at the margins of rainforest on the fibrous bark of the shrubs, *Cassinia aculeata* and *Helichrysum* species (Asteraceae). Associated lichens include species from the genera *Collema*, *Degelia*, *Fuscoderma*, *Leioderma*, *Leptogium*, *Parmeliella*, *Pseudocyphellaria* and *Psoroma*.

SPECIMEN EXAMINED:

Tasmania — Savage River Pipeline Road, north of Donaldson River, 25 May 1990, *G. Kantvilas 259/90* (HO,BG).

8. **Graphina subvelata** (Stirton) Zahlbr., *Catal. lich. univ.* 2: 428 (1924). — *Graphis subvelata* Stirton, *Qld. agric. J.* 5: 488 (1899).

Graphina subvelata is characterised by a thin, pale grey thallus, prominent lirellae with carbonised exciples with an open base, and muriform, ellipsoid spores, 25–32 (–40) × 11–16 (–18) µm with (5–) 7–9 (–11) transverse and 0–4 longitudinal septa (see Hayward 1977 for full description). It contains no substances detectable by TLC. The single Tasmanian specimen is from a twig of *Ulmus* in parkland. The species also occurs in New Zealand and mainland Australia.

SPECIMEN EXAMINED:

Tasmania — Westbury Green, 15 November 1977, *R.D. Seppelt 5294* (HO).

9. **Hypogymnia pulchrilobata** (Bitter) Elix, *Brunonia* 2: 214 (1979). — *Parmelia pulchrilobata* Bitter, *Hedwigia* 40: 244 (1901).

Hypogymnia pulchrilobata is characterised by short, broad, hollow, contiguous lobes, rather inflated, urceolate apothecia and by a PD−, white medulla (see Elix 1979 for full description and discussion). The species is found mostly in the drier parts of southern Australia and New Zealand and appears to be genuinely rare in Tasmania. The single record is from a charred eucalypt log in *Eucalyptus obliqua* open forest. Associated lichens included *Cladonia rigida*, *Hypocenomyce australis*, *H. foveata*, *Hypogymnia pulverata*, *H. turgidula* and *Ochrolechia* sp.

SPECIMEN EXAMINED:

Tasmania — Bermuda Road, 12 km north of Geeveston, 440 m, 25 October 1990, *G. Kantvilas & J. Jarman 596/90* (HO).

10. **Imshaugia aleurites** (Ach.) S.F. Meyer, *Mycologia* 77: 338 (1985). — *Lichen aleurites* Ach., *Lichenogr. Suec. Prodr.* : 117 (1798).

Imshaugia aleurites is characterised by a small, foliose, orbicular thallus with pale grey upper surface and pale fawn underside, granular to cylindrical isidia, densely clustered towards the centre of the thallus, and by the presence of atranorin and thamnolic acid (see Thomson 1984 for full description). In Tasmania, this species forms neat rosettes to *c.* 4 cm wide and may resemble some smaller species of *Parmelinopsis* which differ in having a C+ red or pink medulla, black undersurface and black marginal cilia.

Imshaugia aleurites is widespread on conifers and fence posts in the cool temperate and montane regions of the world e.g. in Europe, North America and Africa. It also occurs in Victoria in montane areas on dead wood (Elix 1990). It has as a similar ecology in Tasmania and occurs on the bark and wood of exposed, bleached trunks of the endemic conifer, *Athrotaxis cupressoides* (Taxodiaceae), in open montane forest. Associated lichens include *Usnea inermis*, *Hypogymnia lugubris* and species of *Mycoblastus* and *Ochrolechia*.

SPECIMEN EXAMINED:

Tasmania — Pine Lake, 1200 m, 4 June 1989, *G. Kantvilas 191/89* (HO,ANUC).

11. **Melanelia piliferella** (Essl.) Essl., *Mycotaxon* 7: 48 (1978). — *Parmelia piliferella* Essl., *Journ. Hattori Bot. Lab.* 42: 83 (1977).

Melanelia piliferella is a small, tightly adpressed, brown, parmelioid species characterised by rather crowded, simple to branched, cylindrical isidia, minute

hyaline cortical hairs at the lobe apices and on the isidia, a HNO_3+ reddish cortex and by the presence of gyrophoric acid (medulla C+ rose) (see Esslinger 1977 for full description). It is only the second species of the genus to be recorded from Tasmania, the other being *M. subglabra* (Räs.) Essl., a corticolous sorediate species found mainly in rainforest.

Although usually corticolous, *M. piliferella* was collected in Tasmania from soft, weathered sandstone in dry sclerophyll forest. Associated species included *Acarospora citrina*, *Flavoparmelia haysomii*, *Parmelia signifera*, *Pseudocyphellaria crocata* and species of *Neofuscelia* and *Xanthoparmelia*.

SPECIMEN EXAMINED:

Tasmania — Hunting Grounds, *c.* 4.5 km west of Dysart, 400 m, 7 October 1981, *G. Kantvilas & P. James 480/81* (HO,BM).

12. **Neofuscelia parviloba** (Essl.) Essl., *Mycotaxon* 7: 51 (1978). — *Parmelia parviloba* Essl., *Journ. Hattori Bot. Lab.* 42: 129 (1977).

This species is characterised by the diminutive subcrustose thalli which form small rosettes to 1.5 cm diameter (sometimes coalescing into larger patches), the absence of soredia and isidia, and the presence of medullary fumarprotocetraric and protocetraric acids (cortex K−, HNO_3+ dark blue-green; medulla PD+ orange red, K+ yellow turning brownish orange). These characters are also found in *N. stygiodes* (Nyl. ex Crombie) Essl., a wide-ranging species of cold, wet habitats and common in the mountains of western and central Tasmania. However, *N. parviloba* has a flatter, thinner thallus, a pale lower surface and scattered rhizines (*N. stygiodes* has a black-brown lower surface and loboid holdfasts rather than rhizines). *N. parviloba* is also known from New South Wales and the Australian Capital Territory. It is apparently uncommon in Tasmania, where it was collected from sandstone rocks in dry sclerophyll forest.

SPECIMEN EXAMINED:

Tasmania — Grass Tree Hill, 400 m, 14 August 1981, *G. Kantvilas 727/81* (HO).

13. **Neofuscelia subloxodella** Elix & Kantvilas *sp. nov.*

Thallus ut in Neofuscelia loxodella sed pagina inferiore straminea vel brunnea et isidiis globosis, inflatis, apicibus saepe erumpentibus differt.

TYPUS: Australia, Tasmania — Cape Deslacs, 42°59′S, 147°33′E, on soil in dry coastal heathland, sea level, 1 June 1980, *G. Kantvilas 230/80* (HOLOTYPUS: HO; ISOTYPI: BM,LSU).

Thallus foliose, terricolous, moderately to tightly appressed to the substrate, *c.* 2–3 cm diameter; lobes irregular, 1.0–2.0 mm wide, short, rounded, imbricate. *Upper surface* olive-brown to dark brown, smooth and strongly glossy at the lobe apices, becoming dull and cracked on older parts of the thallus, soredia absent, densely isidiate; isidia globose then cylindrical, simple at first but expanding laterally and becoming sparingly branched, ultimately the apices becoming inflated and rarely erumpent, not sorediose; medulla white. *Lower surface* dull, pale tan to brown, moderately rhizinate, rhizines concolorous with the lower surface, to 0.3 mm long. *Apothecia* not seen. (Figure 1)

Chemistry: Thallus K−, HNO3+ dark blue-green; medulla K−, C−, KC+ pink turning orange, P−; containing glomelliferic, glomellic and loxodellic acids.

In Australia, there are three species of *Neofuscelia* that produce medullary glomelliferic, glomellic and loxodellic acids, namely *N. loxodella*, *N. waiporiensis* and *N. subloxodella*. The new species is readily distinguished by its pale lower surface (black in the other two taxa) but, like *N. waiporiensis*, develops inflated isidia which ultimately become erumpent. It co-occurs with *N. loxodella* which

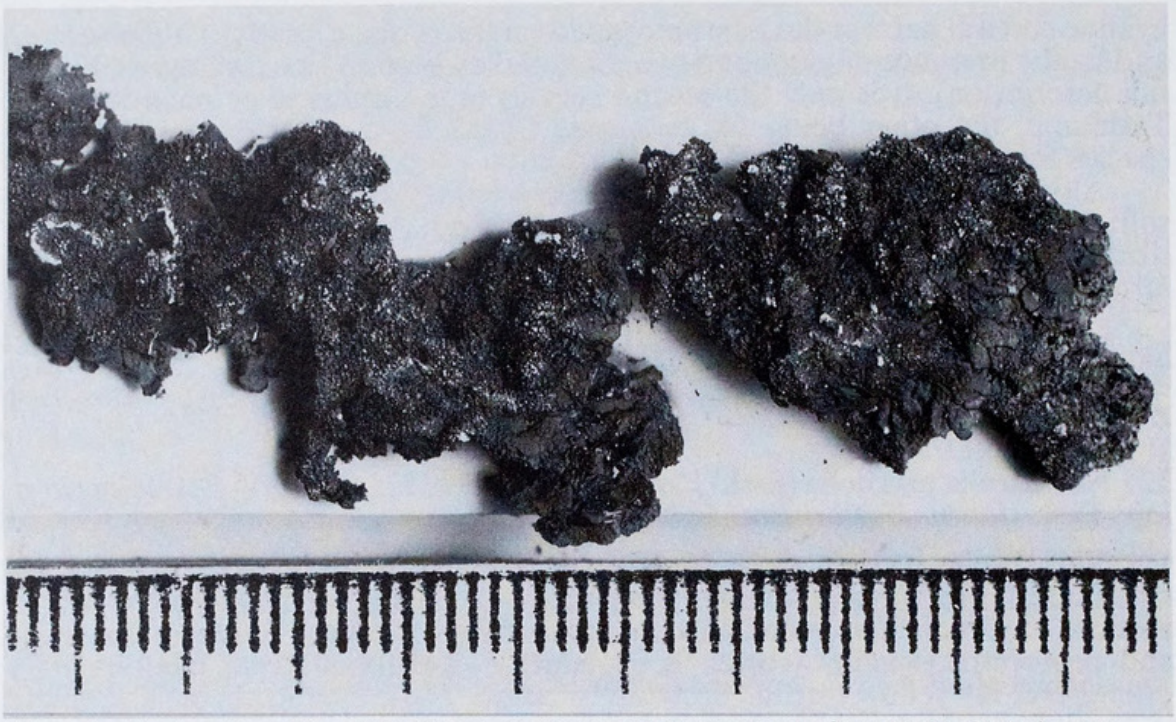

Figure 1. *Neofuscelia subloxodella* Elix & Kantvilas. Holotype *Kantvilas 230/80*. Scale in mm.

has typical cylindrical, non-erumpent isidia. *N. subverrucella*, another isidiate Australian species with a pale brown lower surface, differs from *N. subloxodella* in producing medullary divaricatic acid and by developing cylindrical isidia which do not become inflated or erumpent.

ADDITIONAL SPECIMEN EXAMINED:

South Australia — Mt Kinke, Gairdner-Torrens Basin, Region 4, 7 October 1987, *D.E. Symon 14801* (AD 19121).

14. **Nephroma cellulosum** var. **isidioferum** J. Murray, *Trans. R. Soc. N.Z.* 88: 385 (1960).

Recently recorded for the first time from the Australian mainland (Kantvilas 1990), this taxon is uncommon in Tasmania in comparison to the very abundant typical variety (see White & James 1988 for description of both taxa). It is distinguished by the presence of squamiform phyllidia, found mainly on the ridges of the faveolate thallus. In Tasmania, both varieties are found in rainforest, wet sclerophyll forest and wet scrub where they occur as epiphytes or occasionally on rocks.

SPECIMENS EXAMINED:

Tasmania — Mt Penny, 4 April 1969, *G.C. Bratt & K. McKay 69/165a* (HO); Leslie Creek, 6.4 km east of Zeehan, 160 m, 12 June 1965, *G.C. Bratt & J.A. Cashin 2366* (HO); Tarraleah, 600 m, 30 August 1980, *G. Kantvilas 336/80 p.p.* (HO).

15. **Parmelina conlabrosa** (Hale) Elix & Johnston, *Brunonia* 9: 159 (1986). — *Pseudoparmelia conlabrosa* Hale, *Smithsonian Contr. Bot.* 31: 25 (1976).

Parmelina conlabrosa is characterised by a grey, tightly adnate thallus, abundant rather crowded, cylindrical isidia, and by the presence of lecanoric acid in the medulla (see Filson 1982, Hale 1976a for a full description). The species is locally abundant in Tasmania in dry sclerophyll forest, typically occurring on subdominant trees such as *Exocarpos*, *Banksia*, *Acacia* and *Casuarina*; one collection is from mudstone rocks. It is rather variable, and ranges from individuals with

rather rounded contiguous lobes, centrally densely isidiate, to individuals with rather dispersed sublinear lobes with sparse isidia. The axillary cilia which characterise the genus *Parmelina* are invariably very sparse in this species (see also Elix & Johnston 1986, Elix & Hale 1987).

Parmelina conlabrosa is the isidiate counterpart of the very widespread Australian corticolous species now correctly known as *Parmelina pseudorelicina* (Jatta) Kantvilas & Elix (see below).

SPECIMENS EXAMINED:

Tasmania — Three Thumbs, *c.* 5 km south of Orford, 480 m, 12 October 1989, *G. Kantvilas 204/89* (HO). Grass Tree Hill, 400 m, 14 October 1981, *G. Kantvilas & P. James 707/81* (HO,BM). Bensemans Road, north of Exton, 200 m, 7 November 1980, *G. Kantvilas 568/80, 585/80* (HO,BM). Levendale, 360 m, 1 October 1981, *G. Kantvilas 442/81* (HO,BM). Cape Deslacs, 30 m , 18 July 1981, *G. Kantvilas 430/81* (HO,BM). Square Mountain near Sorell, 150 m, 5 April 1981, *G. Kantvilas 228/81 B* (HO).

Parmelina pseudorelicina (Jatta) Kantvilas & Elix *comb. nov.*

BASIONYM: *Parmelia pseudorelicinia* Jatta, *Bull. Soc. Bot. Ital.* 1910: 254 (1911). HOLOTYPUS: Tasmania, 'ad Sassafrages in Monte Wellington (Hobart Rivulet), alt 600 p'[180 m], *W.A. Weymouth* (NAP!).

SYNONYM: *Parmelina stevensiana* Elix & Johnston, *Brunonia* 9: 157 (1986).

This very common and widespread Australasian corticolous lichen has previously also been referred to (incorrectly) as *Parmelia pruinata* Müll. Arg. or *Parmelina pruinata* (Müll. Arg.) Hale [=*Canoparmelia pruinata* (Müll. Arg.) Elix & Johnston] (Filson 1982, Galloway 1985), which is a relatively uncommon species from South Australia and Western Australia. A full description, discussion and illustration of *Parmelina pseudorelicina* (as *P. stevensiana*) is provided by Elix & Johnston (1986). The type specimen is a fragment of a young, infertile thallus and contains atranorin and lecanoric acid.

Parmelina pseudorelicina is a common epiphyte in Tasmania in wet sclerophyll and dry sclerophyll forest, particularly on species of *Acacia*. It is frequently associated with *Flavoparmelia rutidota, Lecidea laeta, Menegazzia caesiopruinosa, M. platytrema, M. subpertusa, Parmelia cunninghamii, P. tenuirima, Parmelinopsis afrorevoluta, Pertusaria gibberosa, Punctelia subrudecta, Ramalina inflata, R. unilateralis, Usnea inermis* and *U. scabrida*. It may occur also in rainforest as an infrequent canopy species. One collection from coastal heathland (Cape Deslacs) is from mudstone.

16. **Parmelinopsis minarum** (Vainio) Elix & Hale, *Mycotaxon* 29: 243 (1987). — *Parmelia minarum* Vainio, *Acta Soc. Faun. Fl. fenn.* 7: 48 (1890).

Morphologically this species resembles *Parmelina conlabrosa* (Hale) Elix & Johnston as both taxa have narrow ciliate lobes, produce cylindrical isidia, and exhibit a medullary C+ red reaction. However, *P. conlabrosa* has simple rhizines and contains lecanoric acid, while *P. minarum* has a more fragile thallus, scattered dichotomously branched rhizines and contains gyrophoric acid and 5-O-methylhiascic acid (see Hale 1976b for a full description). This pantemperate, corticolous species is apparently rare in Tasmania, although it is quite common at lower latitudes along the east coast of mainland Australia. It was recorded from the bark of *Notelaea ligustrina* in wet sclerophyll forest where it was associated with *Parmelina conlabrosa, Parmelia tenuirima, Parmelinopsis afrorevoluta* and species of *Usnea*.

SPECIMEN EXAMINED:

Tasmania — Square Mountain near Sorell, 150 m, 5 April 1981, *G. Kantvilas 228/81A* (HO).

17. **Parmelinopsis neodamaziana** (Elix & Johnston) Elix & Hale, *Mycotaxon* 29: 243 (1987). — *Parmelina neodamaziana* Elix & Johnston, *Brunonia* 9: 155 (1986).

Parmelinopsis neodamaziana is an uncommon species in Tasmania, known from a single collection from sheltered granite rocks in dry sclerophyll forest. Associated taxa included *Parmelia sulcata, Neofuscelia pulla, Xanthoparmelia mougeotina* and *Lichenothelia* aff. *solitarioides.* The species is also known from similar habitats in Queensland and New South Wales, and is characterised by delicate, linear-elongate, truncate lobes, mostly 0.5–1.5 mm wide with abundant marginal cilia, and by the lack of isidia or soredia [see Elix & Johnston (1986) for full description and illustration]. The medulla reacts C+ pale pink, and contains gyrophoric acid, 5-O-methylhiascic acid, 2,4,5-tri-O-methylhiascic acid and 2,4-di-O-methylgyrophoric acid.

Specimen Examined:

Tasmania — Sleepy Bay road, c. 1 mile west of coast, 20 m, 2 February 1984, *P. James & G. Kantvilas s.n.* (HO).

18. **Parmeliopsis ambigua** (Wulf.) Nyl., *Syn. Lich.* 2: 54 (1863). — *Lichen ambiguus* Wulf. in Lacq., *Coll. ad Botanic.* 4: 239: tab. 4, fig. 2 (1790).

Parmeliopsis ambigua is characterised by a tightly adnate, orbicular, small foliose to ± placodioid pale yellow thallus with capitate soralia and black to dark brown, rhizinate lower surface [see Thomson (1984) for detailed description and Wirth (1987) for photograph]. It contains usnic and divaricatic acids. Apothecia are not known in Tasmanian material.

This species is widespread on bark and wood in the cold to cool temperate regions of the Northern Hemisphere and has also been recorded from New South Wales. It is very rare in Tasmania where it has been collected from the dead twigs of *Orites acicularis* in alpine heathland at the margins of open montane forest of *Athrotaxis cupressoides.* Associated lichens included *Menegazzia testacea* and *Hypogymnia lugubris.*

Specimen Examined:

Tasmania — Walls of Jerusalem, foot of Halls Buttress, 1330 m, 10 December 1987, *G. Kantvilas 111/87* (HO,ANUC).

19. **Rimelia cetrata** (Ach.) Hale & Fletcher, *Bryologist* 93: 26 (1990). — *Parmelia cetrata* Ach., *Syn. Lich.* : 198 (1814).

Rimelia cetrata is characterised by a large foliose thallus, broad lobes with prominent cilia, a pale grey upper surface with a reticulum of maculae which develop into cracks in older lobes, simple to squarrose branched rhizines and prominent pedicellate apothecia with a perforate disc (see Hale & Fletcher 1990 for a full description). *R. cetrata* is widespread in temperate regions of the world being particularly common in south-eastern United States and in South Africa, especially on corticolous substrates. This species appears uncommon in Tasmania where is was recorded from sheltered granite outcrops in dry sclerophyll forest. Previous reports of this species in Australia refer to *Rimelia austrocetrata* (Elix & Johnston) Hale & Fletcher, a species which differs in developing laciniate, dissected lobes with a fragmented and exfoliating upper cortex (Elix & Johnston 1988).

Specimen Examined:

Tasmania — Freycinet Peninsula, Sleepy Bay Road, 20 m, 15 October 1980, *G. Kantvilas 478/80* (HO).

20. **Tomasellia ischnobela** (Nyl.) Keissl., *Rab. Krypt. Fl.*, Band 9, Abt.1, 2: 431 (1938). — *Melanotheca ischnobela* Nyl., *Flora* 59: 238 (1876).

Tomasellia ischnobela is an inconspicuous species, found in Tasmania on smooth, shaded bark in cool temperate rainforest. It is distinguished by the following characters:

> thallus crustose, thin, scurfy to absent; ascocarps perithecioid, consisting of black, irregularly hemispherical stromata, 0.2–0.5 mm wide, with 2–4 separate chambers; pseudoparaphyses branched, anastamosing, persistent; spores filiform, multiseptate, 50–120 × 1–2 µm, 8 per ascus, arranged side by side in bundles (see also Swinscow 1965, Poelt 1969).

The species is doubtfully lichenised and is apparently closely related to *Leptorhaphis* (see also Aguirre & Hawksworth 1987). *Tomasellia ischnobela* is also known from the British Isles.

Specimens Examined:

Tasmania — Balts Spur, Tasman Peninsula, 420 m, July 1983, *G. Kantvilas 166/83* (HO); Weindorfers Forest, Waldheim, 820 m, 30 March 1988, *G. Kantvilas 57/88* (HO).

21. **Trapeliopsis flexuosa** (Fr.) Coppins & P. James, *Lichenologist* 16: 258 (1984). — *Biatora flexuosa* Fr., *Sched. crit. lich. Suec.* 2 (fasc.8): 11 (1826).

Trapeliopsis flexuosa is recognised by the following characters:

> thallus pale glaucous grey, areolate-crustose to minutely subsquamulose, coarsely sorediate, C+ red and containing gyrophoric acid; soralia roundish, scattered, sometimes becoming confluent; apothecia 0.25–0.75 (–1) mm diam., disc brownish grey to greenish grey, plane to convex, proper margin pale, persistent; spores simple, 6.5–10 × 2.5–4 µm (see Coppins & James 1984 for further data).

In Tasmania, *T. flexuosa* has been recorded in wet sclerophyll forest on charred eucalypt stumps. It was associated with species typical of this habitat, including *Hypocenomyce australis*, *H. foveata*, *Cladia schizopora*, *Cladonia rigida* and *Neophyllis melacarpa*. The species is known from Europe and North America and has also been recorded from Victoria (Müller 1893) and Queensland (Hafellner *et al.* 1989).

Specimen Examined:

Tasmania — Yarlington Tier, 620 m, 30 November 1988, *G. Kantvilas 587/88* (HO,O).

22. **Xanthoparmelia exillima** (Elix) Elix & Johnston, *Bull. Br. Mus. nat. Hist. (Bot.)* 15: 245. — *Parmelia exillima* Elix, *Aust. J. Bot.* 29: 357 (1981).

Xanthoparmelia exillima is a small, subcrustose, narrow-lobed, isidiate species, known from southern Australia and New Zealand. In Tasmania, it is rare and known from a single collection from sandstone in dry sclerophyll forest. It is very similar to the very common lichen, *X. mougeotina*, but differs in having a yellow-brown to brown lower surface and containing norlobaridone (medulla P−, K−, C−, KC+ rose). For a full description and illustration, see Elix (1981) and Elix *et al.* (1986).

Specimen Examined:

Tasmania — Hunting Grounds, *c.* 4.5 km west of Dysart, 400 m, 7 October 1981, *G. Kantvilas & P. James 474/81* (HO,BM).

23. **Xanthoparmelia rubrireagens** (Gyelnik) Hale, *Phytologia* 28: 488 (1974). — *Parmelia rubrireagens* Gyelnik, *Annls. Mycol.* 36: 288 (1938).

Xanthoparmelia rubrireagens is one of several similar species with loosely adnate, linear-elongate, ± subdichotomous lobes (termed the '*subnuda*-group' by Elix *et al.* 1986). It is characterised by a black, ± wrinkled, very sparsely rhizinate lower surface and by the presence of salazinic acid (medulla P+ orange, K+ yellow red). Known also from south-eastern Australia and New Zealand, the species was recorded in Tasmania from sandstone outcrops in dry sclerophyll forest. The species was previously referred to in Australian literature as *X. eradicata*, a South African taxon, and a full description and illustration are provided by Elix *et al.* (1986) under that name.

SPECIMEN EXAMINED:

Tasmania — Hunting Grounds, *c.* 4.5 km west of Dysart, 400 m, 7 October 1981, *G. Kantvilas & P. James 486/81* (HO,BM).

24. **Zahlbrucknerella calcarea** (Herre) Herre, *J. Wash. Acad. Sci.* 2: 384 (1912). — *Zahlbrucknera calcarea* Herre, *Proc. Wash. Acad Sci.* 12: 129 (1910).

Zahlbrucknerella calcarea is a cosmopolitan species characterised by a minutely filamentous, blackish thallus, tiny apothecia with a distinct thalline margin and brown disc, and simple, hyaline, broadly ellipsoid to subglobose spores, 6.5–9 (–11) × 5–8 µm, up to 24 per ascus. It is very inconspicuous and forms tiny, dispersed tufts *c.* 0.5 mm tall and 0.5–1 mm wide on limestone and dolomite (see Henssen 1977, Galloway 1985 for further data). The Tasmanian collection was associated with *Placynthium nigrum* and occurred on limestone outcrops in pasture.

SPECIMEN EXAMINED:

Tasmania — Mole Creek, 350 m, 19 February 1984, *G. Kantvilas & P. James 366/84A* (HO,MB,BM).

ACKNOWLEDGEMENTS

We thank Dr S.J. Jarman for comments on the manuscript, Mr A. Aptroot, Dr A.W. Archer, Dr D.J. Galloway, Prof. P.M. Jørgensen, Dr E. Timdal and Prof. Dr. A. Henssen for comments on selected specimens and Prof. P.L. Nimis for locating the type specimen of *Parmelina pseudorelicina*.

REFERENCES

Aguirre, B. & Hawksworth, D.L. (1987) The circumscription, biology and relationships of the genus *Leptorhaphis* Körber. *Bibliotheca Lichenologica* 25: 249–255.

Archer, A.W. (1988) The lichen genus *Cladonia* section *Cocciferae* in Australia. *Proc. Linn. Soc. N.S.W.* 110: 205–213.

Archer, A.W. & Bartlett, J.K. (1986) New species and distribution of the lichen genus *Cladonia* in New Zealand together with a revised key. *N.Z. J. Bot.* 24: 581–587.

Arvidsson, L. & Galloway, D.J. (1981) *Degelia*, a new lichen genus in the Pannariaceae. *Lichenologist* 13: 27–50.

Coppins, B.J. (1988) Notes on the genus *Arthopyrenia* in the British Isles. *Lichenologist* 20: 305–325.

Coppins, B.J. & James, P.W. (1984) New or interesting British lichens V. *Lichenologist* 16: 241–264.

Elix, J.A. (1979) A taxonomic revision of the lichen genus *Hypogymnia* in Australasia. *Brunonia* 2: 175–245.

Elix, J.A. (1981) New species of *Parmelia* subgen. *Xanthoparmelia* (lichens) from Australia and New Zealand. *Aust. J. Bot.* 29: 349–376.

Elix, J.A. (1990) Lichenes Australasici Exsiccati, Fasc. 8, No. 183.

Elix, J.A. & Hale, M.E. (1987) *Canomaculina, Myelochroa, Parmelinella, Parmelinopsis* and *Parmotremopsis*, five new genera in the Parmeliaceae (lichenized Ascomycotina). *Mycotaxon* 29:233–244.

Elix, J.A. & Johnston, J. (1986) New species of *Parmelina* (Lichenized Ascomycotina) from Australia and New Zealand. *Brunonia* 9: 155–161.

Elix, J.A. & Johnston, J. (1988) New species in the lichen family Parmeliaceae (Ascomycotina) from the Southern Hemisphere. *Mycotaxon* 31: 491–510.
Elix, J.A., Johnston, J. and Armstrong, P.A. (1986) A revision of the lichen genus *Xanthoparmelia* in Australasia. *Bull. Br. Mus. nat. Hist. (Bot.)* 15: 163–362.
Esslinger, T.L. (1977) A chemosystematic revision of the brown *Parmeliae*. *J. Hattori Bot. Lab.* 42: 1–211.
Filson, R.B. (1982) A contribution on the genus *Parmelia* (Lichens) in southern Australia. *Aust. J. Bot.* 30: 511–582
Galloway, D.J. (1985) 'Flora of New Zealand Lichens.' (Wellington: Government Printer.)
Galloway, D.J. & Jørgensen, P.M. (1975) *Erioderma sorediatum*, a new lichen from New Zealand. *Lichenologist* 7: 139–142.
Hafellner, J., Filson, R.B. & Rogers, R.W. 1989 Some genera and species of lichenized fungi new to Australia. *Nova Hedwigia* 48: 229–235.
Hale, M.E. (1976a) A monograph of the lichen genus *Pseudoparmelia* Lynge. *Smithsonian Contrib. Bot.* 31: 1–62.
Hale, M.E. (1976b) A monograph of the lichen genus *Parmelina* Hale (Parmeliaceae). *Smithsonian Contrib. Bot.* 33: 1–59.
Hale, M.E. & Fletcher, A. (1990) *Rimelia* Hale & Fletcher, a new lichen genus (Ascomycotina: Parmeliaceae). *Bryologist* 93: 23–29 (1990).
Hayward, G.C. (1977) Taxonomy of the lichen families Graphidaceae and Opegraphaceae in New Zealand. *N.Z. J. Bot.* 15: 565–584.
Henssen, A. (1977) The genus *Zahlbrucknerella*. *Lichenologist* 9: 17–46.
Henssen, A. & James, P.W. (1980) *Parmeliella duplomarginata*, a new lichen from New Zealand. *Mycotaxon* 11: 217–229.
Jørgensen, P. M. & James, P. W. (1990) Studies in the lichen family Pannariaceae IV. The genus *Degelia*. *Bibliotheca Lichenologica* 38: 253–276.
Kantvilas, G. (1989) A checklist of Tasmanian lichens. *Pap. Proc. R. Soc. Tasm.* 123: 67–85.
Kantvilas, G. (1990) Notes on the lichen flora of New South Wales I. New records. *Telopea* 4: 19–31.
Müller, J. (1883) Lichenologische Beiträge XVII. *Flora* 66: 305.
Müller, J. (1893) Lichenes Wilsoniani. s. lichenes a cl. Rev. F.R.M. Wilson in Australiae Prov. Victoria lecti. *Bull. Herb. Boissier* 1: 33–65.
Poelt, J. (1969) 'Bestimmungsschlüssel Europäischer Flechten.' (Cramer: Vaduz.)
Swinscow, T.D.V. (1965) Pyrenocarpous Lichens: 9 Notes on various species. *Lichenologist* 3: 72–83.
Thomson, J.W. (1984) 'American Arctic Lichens I. The Macrolichens.' (Columbia Univeristy Press: New York.)
White, F.J. & James, P.W. (1988) Studies on the genus *Nephroma* II. The southern temperate species. *Lichenologist* 20: 103–166.
Wirth, V. (1987) 'Die Flechten Baden-Württembergs Verbreitungsatlas.' (Verlag Eugen Ulmer: Stuttgart.)

Revised manuscript received 6 June 1991.