NEW SAXICOLOUS SPECIES OF *STRIGULA* Fr. (LICHENISED ASCOMYCOTINA: STRIGULACEAE) FROM AUSTRALIA AND NEW ZEALAND

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ABSTRACT

McCarthy, P.M. New saxicolous species of *Strigula* Fr. (lichenised Ascomycotina: Strigulaceae) from Australia and New Zealand. **Muelleria 8(3): 323–329 (1995).** — The saxicolous *Strigula australiensis* sp. nov. and *S. minutula* sp. nov. are described from Queensland, Australia, and *S. johnsonii* sp. nov. is described from the South Island of New Zealand. *Strigula australiensis* and *S. johnsonii* are unusual in that they have muriform ascospores.

INTRODUCTION

Species of *Strigula* have crustose thalli with *Cephaleuros* or *Trentepohlia* as the photobiont and perithecia that are characterised by simple or branched paraphyses, cylindrical, fissitunicate asci with a non-amyloid apex, a distinct ocular chamber and 1-septate to muriform ascospores. Conidiomata may be of two types and produce either minute, simple microconidia or larger, septate macroconidia. The latter usually have apical gelatinous appendages and their septation tends to mirror that of the ascospores.

Although most species are foliicolous in tropical and subtropical regions (Lücking 1992, Santesson 1952 and others), a comparatively small, but increasing number of corticolous and saxicolous taxa have been recognised (Harris 1975, Bricaud & Roux 1991, Purvis *et al.* 1992, Etayo 1993, Roux & Bricaud 1993, Canals *et al.* 1995). In Australasia, saxicolous specimens of *S. stigmatella* (Ach.) R. C. Harris were recently reported from eastern New South Wales (McCarthy 1993a) and Queensland (McCarthy 1994) and a calcicolous lichen from New Zealand, previously known as *Porina rhodinula* Zahlbr., was re-identified as *S. affinis* (Massal.) R. C. Harris (McCarthy 1993b).

The present contribution follows the collection of saxicolous specimens of *Strigula* in coastal areas of eastern Queensland and the South Island of New Zealand. Two of the three species described here are unusual in that they produce submuriform and muriform ascospores. Such septation is already known in a small number of non-foliicolous *Strigula* species including the North American, corticolous *S. submuriformis* (R.C. Harris) R.C. Harris (Harris 1973) and a southern European, calcicolous *species* (Canals *et al.* 1995).

THE SPECIES

Strigula australiensis P.M. McCarthy *sp. nov.*

Thallus epilithicus, continuus vel leviter rimosus, obscure pallido viridigriseus vel pallido griseobrunneus, (30–)60(–100) µm crassus. Algae *Trentepohlia*, 7–14 × 6–12 µm. Perithecia semiimmersa vel 2/3-immersa. Involucrellum (0.32–)0.44(–0.58) mm diametro. Paraphyses simplices vel leviter ramosae. Asci fissitunicati, cylindrici, 68–93 × 17–22 µm. Ascosporae submuriformes, (23–)29(–36) × (7–)9.5(–11.5) µm. Microconidia simplices, 2–3 × *c.* 0.8 µm. Macroconidia submuriformes, (19–)23.5(–30) × (6–)7.5(–9) µm.

TYPUS: Australia, Queensland, 13 km SE of Innisfail, 3 km NE of Mena, Utchee Creek, by Utchee Falls, 17°38′24″S, 145°56′19″E, on shaded semi-aquatic basalt, 12 Sep. 1993, *P.M. McCarthy 936* (HOLOTYPUS: MEL 1057469; ISOTYPUS: BRI).

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Thallus crustose, epilithic, effuse to determinate, continuous to sparingly rimose, pale greenish-grey to pale grey-brown, smooth to minutely and irregularly uneven, matt, ecorticate, (30–)60(–100) µm thick. *Algae Trentepohlia*; cells broadly ellipsoid to globose, 7–14 × 6–12 µm. *Hyphae* 2–3 µm wide. *Prothallus* not apparent. *Perithecia* semi-immersed to 2/3 immersed, usually solitary, occasionally paired, moderately to very numerous. *Perithecial apex* plane or convex. *Ostiole* inconspicuous or in a shallow, 60–100 µm wide depression. *Involucrellum* greyish-black in surface view, brown-black to black in thin section, dimidiate or extending to excipulum-base level, (0.32–)0.44(–0.58) mm diam., 30–60 µm thick towards the apex, 60–90 µm thick at the base, K−. *Centrum* broadly ovate to depressed-ovate, 0.2–0.32 mm diam. *Excipulum* uniformly hyaline to very pale brown, 15–20(–25) µm thick. *Paraphyses* simple to sparingly branched (especially near their apices), not anastomosing, septate, long-celled, 1–1.5 µm thick; cells frequently guttulate. *Periphyses* absent. *Asci* fissitunicate, 8-spored, broadly to elongate-cylindrical, 68–93 × 17–22 µm; lateral walls *c.* 1 µm thick; apex rounded, 3–6 µm thick, with an ocular chamber 1–3 µm broad and 1–2 µm tall, convex to tuberculate; walls and apex IKI−; ascoplasma IKI+ red-brown. *Ascospores* hyaline, elongate-ellipsoid to elongate-fusiform, submuriform, with 7–9(–11) transverse septa, each loculus with (0–)1(–2) longitudinal or diagonal septa, often with a 2–3 µm thick gelatinous sheath when immature, irregularly biseriate in the asci, (23–)29(–36) × (7–)9.5(–11.5) µm (91 measured). *Conidiomata* of two types: 1) 60–100 µm diam., black above, colourless below, with a simple conidiogenous layer and fusiform microconidia of 2–3 × *c.* 0.8 µm; 2) 0.19–0.24 mm diam., black above, colourless below, with narrowly cylindrical or narrowly ellipsoid, submuriform macroconidia of (19–)23.5(–30) × (6–)7.5(–9) µm, mostly with convex to acuminate, gelatinous appendages at their apices, growing obliquely from the tips of short, unbranched, *c.* 3 µm wide conidiophores. (Fig. 1).

Remarks

Strigula australiensis is characterised by moderately large perithecia and submuriform ascospores and macroconidia which, because they are broader than those of taxa described heretofore, are concomitantly more abundantly septate. Moreover, not only has the New Zealand taxon *S. johnsonii* larger perithecia, its ascospores are discontinuously longer and fully muriform (see below).

This lichen appears to be confined to shaded basalt and granite in warm-temperate and tropical rainforest in eastern Australia. It has been collected in two localities in south-eastern Queensland and in the north-east of the state on and below the Atherton Tableland. This disjunction corresponds with one of climate and land-use in the central coastal region of Queensland between latitudes 26°S and 21°S. Thus the Great Dividing Range dissipates, precipitation is lower, agriculture is more intensive and rainforest all but disappears. Above latitude 21°S, however, the coastal areas are more mountainous and, thus, topography together with heavy summer rains support rainforest and its associated lichens.

Additional Specimens Examined

Queensland — Lamington National Park, Green Mountains, near Border Track, above Elabana Falls, Canungra Creek, on semi-aquatic basalt, 4 Sep. 1993, *P.M. McCarthy 733* (MEL 1057466); Bunya Mountains National Park, just above Paradise Falls, on dry shaded rocks beside creek, 5 Sep. 1993, *P.M. McCarthy 771* (MEL 1057468); Atherton Tableland, 30 km WSW of Innisfail, Palmerston National Park, below Tchupala Falls and above Wallicher Falls, tributary of North Johnstone R., on dry shaded basalt, 10 Sep. 1993, *P.M. McCarthy 815B* (MEL 1057471); Atherton Tableland, Bellenden Ker Range, 6 km W of Babinda, Babinda Creek, The Boulders, on shaded granite beside creek, 12 Sep. 1993, *P.M. McCarthy 909* (MEL 1057473).

Strigula johnsonii P.M. McCarthy *sp. nov.*

Thallus epilithicus, continuus vel leviter rimosus, nitidus, argenteogriseoviridis, (30–)50–80(–100) µm crassus. Algae *Trentepohlia*, (6–)8–15(–20) × (6–)8–13(–16) µm. Perithecia semiimmersa vel immersa. Involucrellum (0.42–)0.6(–0.82) mm diametro. Paraphyses simplices vel leviter ramosae. Asci fissitunicati, cylindrici, 110–160 × 28–38 µm. Ascosporae muriformes, fusiformes vel elongatae-fusiformes, (37–)49(–63) × (10–)15(–19) µm. Conidia non vidi.

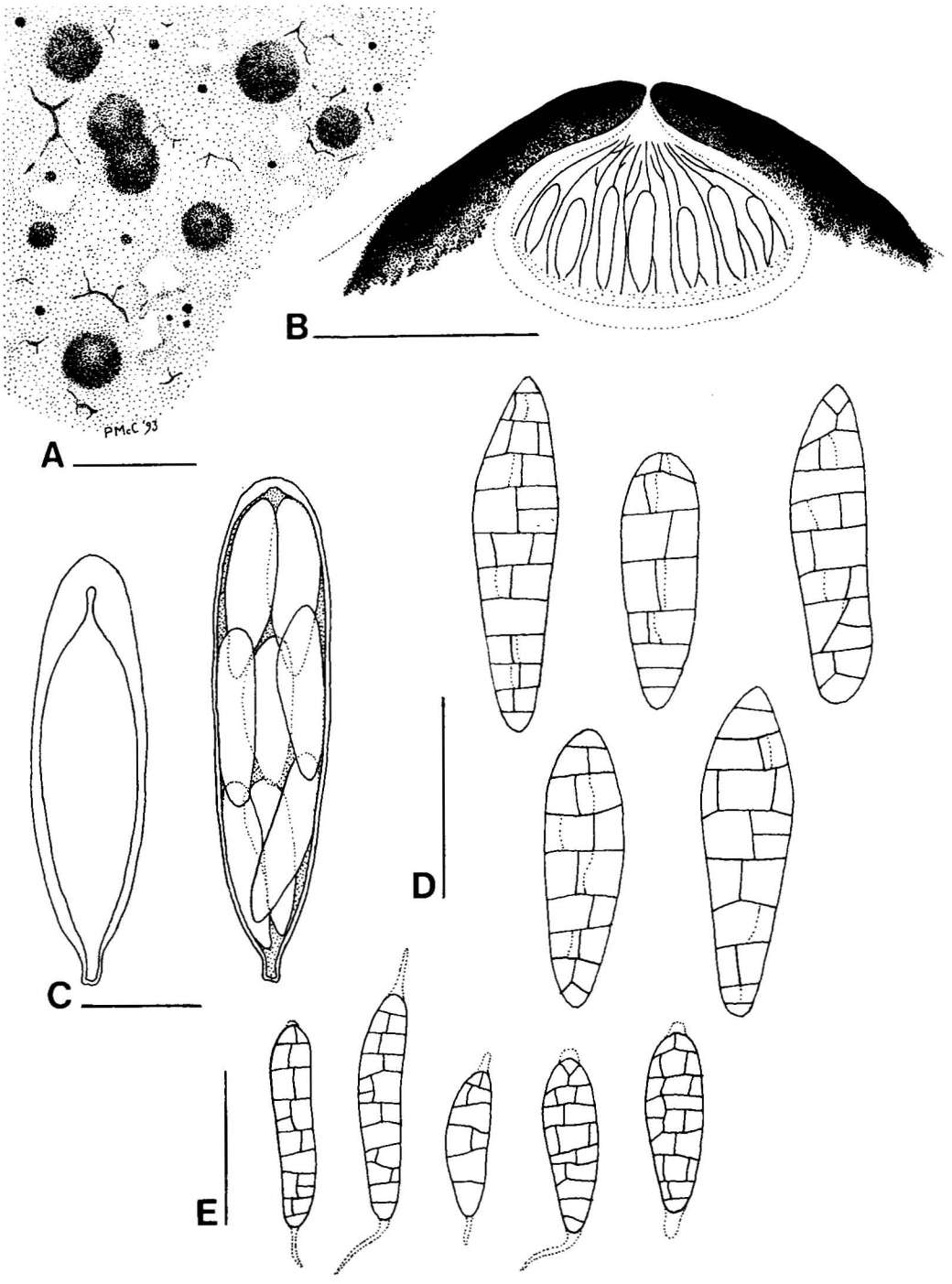

Fig. 1. *Strigula australiensis* (a-d, holotypus; e, MEL 1057471). a — habit of thallus, perithecia and conidiomata; scale 1 mm. b — vertical section of perithecium; scale 0.2 mm. c — immature and mature asci. d — ascospores. e — macroconidia; scales c-e 20 µm.