

## A NEW SPECIES OF *ALEURODISCUS* (STEREACEAE) FROM MT KOSCIUSZKO, AUSTRALIA

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### Abstract

*Aleurodiscus lacunae-equimortui*, found on dead attached branches of *Eucalyptus pauciflora* on Mt Kosciuszko, Australia, is proposed as a new species, and compared with similar species. A key to the species of *Aleurodiscus sensu lato* known from Australia and New Zealand is provided.

**Key words:** Stereaceae, eucalypt fungi, systematics.

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### Introduction

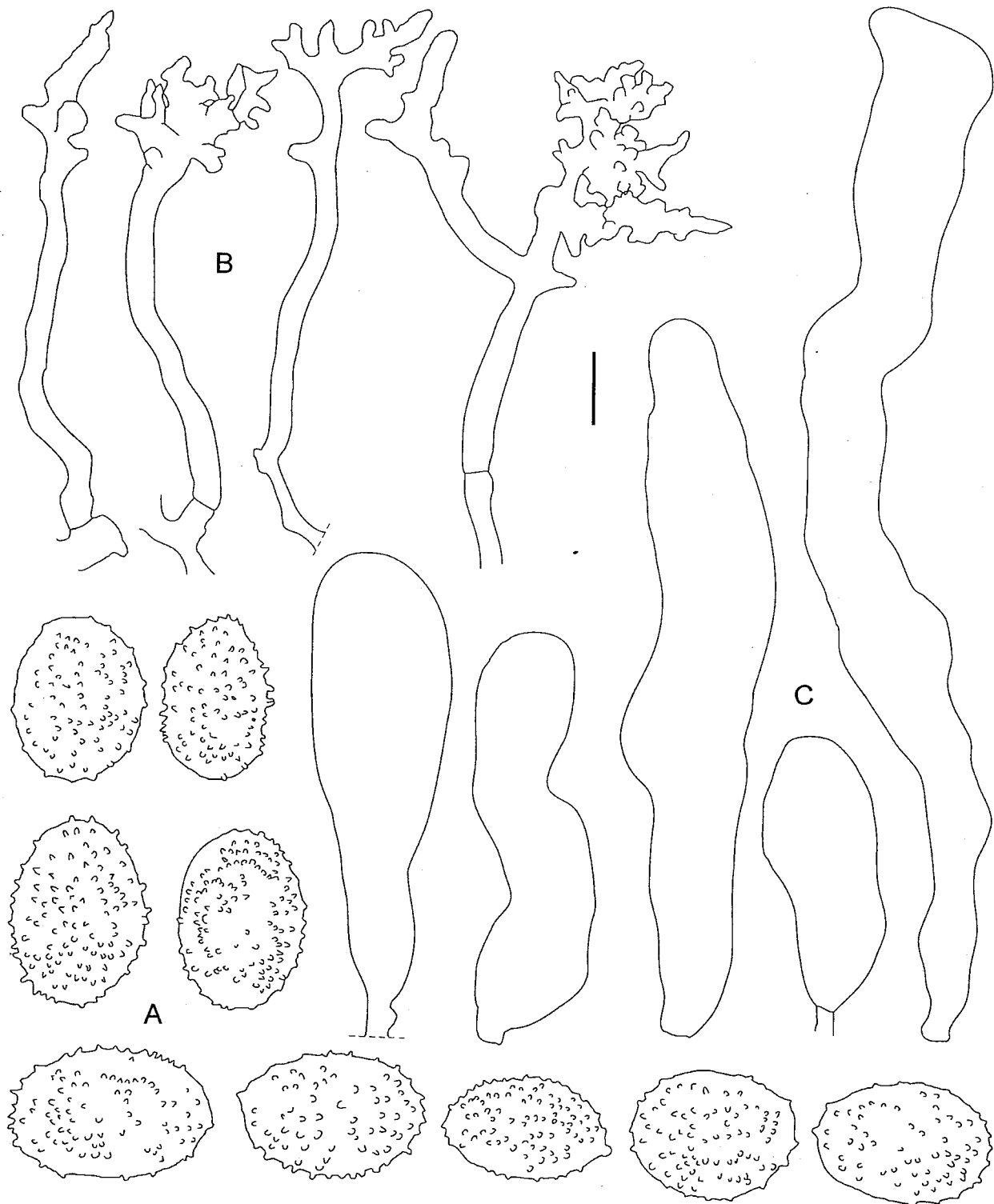
Recent molecular studies indicate *Aleurodiscus* Rabenh. ex J. Schröt. *sensu lato* is together with *Megalocystidium leucoxanthum* (Bres.) Jülich, *Stereum* Pers., and *Xylobolus* Karsten, a member of a monophyletic subclade, the Stereaceae (Wu *et al.* 2001), in the russuloid clade (Binder & Hibbett 2002). Adopting a broad generic concept, Núñez & Ryvardeen (1997) accepted 71 species in *Aleurodiscus sensu lato*. Other authors have adopted much narrower generic concepts for these fungi (Boidin *et al.* 1985, Wu *et al.* 2000) recognising about 10 genera in the complex. *Aleurodiscus sensu lato* was shown (Wu *et al.* 2001) using LROR-LR5 sequences from nuc-lsu rDNA to be paraphyletic. Many of the segregate genera as presently circumscribed are not monophyletic. Molecular phylogenetic analyses (Wu *et al.* 2001) indicate there has been homoplasy in most of the characters used previously to characterise the segregate genera *e.g.* presence of acanthophyses, amyloidity of basidiospores or acanthophyses, basidiospore ornamentation, clamp connections, hymenial colour or kind of decay caused. However, the LROR-LR5 sequences for many species of *Aleurodiscus sensu lato*, including the type species of some segregate genera, have not yet been studied so generic limits have still to be determined (Wu *et al.* 2001).

Cunningham (1963), adopting a narrow generic concept, reported from Australasia one species of *Aleurocystis* Lloyd, seven species of *Aleurodiscus* and 15 species of *Acanthophysium* (Pilát) G. Cunn. Except for six species of *Acanthophysium* previously transferred by Lemke (1964a, 1964b) to *Dendrothele* Höhn. & Litsch., and *Aleurodiscus pateriformis* G. Cunn., which they placed into synonymy with *A. parmiformis* G. Cunn., all were accepted by Núñez & Ryvardeen (1997) as good species of *Aleurodiscus sensu lato*.

While collecting fungi on Mt Kosciuszko, New South Wales, Australia we found a species of *Aleurodiscus sensu lato* growing on attached dead branches of living snow gum trees. Mt Kosciuszko (2228 m) is the highest mountain in Australia. Snow gums, *E. pauciflora* Sieber ex Spreng. and *E. niphophila* Maiden & Blakely, are the predominant tree species just below the tree line (Good 1992). The fungus is described and illustrated in this paper.

### Materials and Methods

Free-hand thin sections of basidiomata were briefly soaked in 70% ethanol then mounted in ammoniacal Congo Red, 5% KOH, Melzer's reagent, lactic acid Fuchsin or distilled water. Sulphovanillin was used to detect the reaction of gloeocystidia. For macro- and micro-structures we have followed the definitions and terminology of Jülich & Stalpers (1980). Measurements in parentheses are the means  $\pm 1$  std deviation.



**Figure 1.** *Aleurodiscus lacunae-equimortui*. A. Basidiospores. B. Dendrohyphidia. C. Thin-walled gloeocystidia. Scale bar = 10  $\mu$ m. Holotype.

### Taxonomy

***Aleurodiscus lacunae-equimortui*** J.A. Simpson & C.A. Grgurinovic, *sp. nov.* (Figs. 1 & 2)

*Etymology:* named after the place of collection.

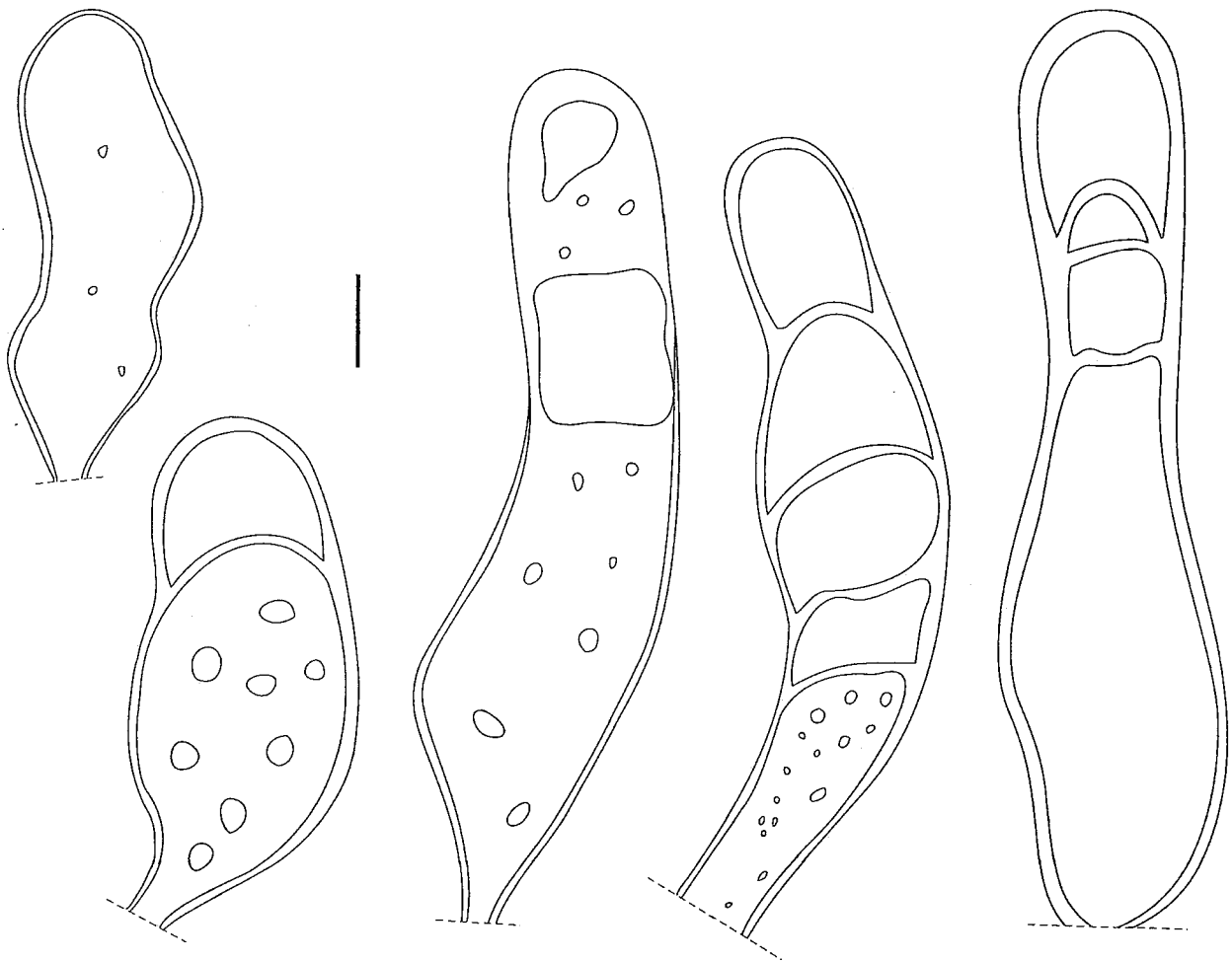


Figure 2. *Aleurodiscus lacunae-equimortui*. Thick-walled gloeocystidia. Scale bar = 10  $\mu$ m. Holotype.

*Basidioma* resupinatum, arcte adnatum, tenue, quasi 0.1–0.2 mm crassum, plus coriaceum. Hymenophorum leve, primum albus, rimosum. Systema hyphale monomiticum; hyphae distinctae, tenuitunicatae, 3–4.5  $\mu$ m latae, sine fibulis. Basidia clavata, grandia, 55–73  $\times$  12–16  $\mu$ m, 4 sterigmatibus. Sporae obovatum tenuitunicatae, 17–31.8  $\times$  10.5–21 (26.7  $\pm$  3.8  $\times$  18.6  $\pm$  2.5, n = 20)  $\mu$ m, spinulose, amyloideae. Dendrohyphidiae numerosae, inclusae vel plerumque projectae, ramosissimae, leviter incrustatae. Gloeocystidia 45–170  $\times$  15.5–25 (85.7  $\pm$  36  $\times$  20  $\pm$  3.2, n = 20)  $\mu$ m, cylindriformia, tenuitunicata vel parietibus incrassatis et tum 0–4 septata. Habitatio: ramus mortuus, affixum ad *Eucalyptus pauciflora*.

Holotypus hic designatus: Australia, New South Wales, Thredbo, Kosciuszko National Park, 12.i.2002, J.A. Simpson 011/02 & C.A. Grgurinovic (CANB 639970).

*Basidiomata* resupinate, adnate, adherent, to 30 mm diam., 0.1–0.2 mm thick, coriaceous, white, confluent, the margin regular, indeterminate. *Hymenophore* smooth, white, unchanging, drying deeply rimose, catahymenial. *Hyphal system* monomitic, generative hyphae 3–4.5  $\mu$ m diam., simple septate, thin-walled, hyaline, smooth. *Basidia* 55–73  $\times$  12–16  $\mu$ m, clavate, tetra-sterigmate, sterigmata to 10  $\mu$ m long. *Basidiospores* 17–31.8  $\times$  10.5–21 (26.7  $\pm$  3.8  $\times$  18.6  $\pm$  2.5, n = 20)  $\mu$ m, obovoid, amyloid, finely and subdistantly spinosely ornamented. *Acanthophyses* none. *Dendrohyphidia* numerous, thin-walled, sparsely to richly branched, projecting above the basidia, 70–95  $\mu$ m long, stalk 2.5–4.5  $\mu$ m diam., inamyloid, covered with hyaline crystals that are soluble in alkaline solutions. *Gloeocystidia* voluminous, 45–170  $\times$  15.5–25 (85.7  $\pm$  36  $\times$  20  $\pm$  3.2, n = 20)  $\mu$ m, thin- or thick-walled, if thick-walled 0–4 transversely septate, walls to 2.5  $\mu$ m thick, hyaline, contents in sulphovanillin giving a pink-red reaction. Causing a uniform white rot of the wood.

*Material examined*: Australia, New South Wales, Thredbo, Kosciuszko National Park, track to Dead Horse Gap, on attached dead decorticated branch of *Eucalyptus pauciflora*, 12.i.2002, J.A. Simpson 011/02 & C.A. Grgurinovic, holotype designated here (CANB 639970); Thredbo, Kosciuszko National Park, track to Dead

Horse Gap, on dead, attached, branch of *E. pauciflora*, 12.i.2002, J.A. Simpson 013/02 & C.A. Grgurinovic (CANB 639971).

### Discussion

The absence of clamp connections, the large, amyloid, rough-walled basidiospores, the absence of acanthophyses and abundant dendrohyphidia and gloeocystidia indicate *A. lacunae-euimortui* is a species of *Aleurodiscus sensu stricto* (Wu *et al.* 2001). *Aleurodiscus lacunae-euimortui* is similar to *A. amorphus* but that species has few dendrohyphidia and those are sparsely branched, the hymenium is pink, and it occurs only on *Abies*. *Aleurodiscus aurantius* has gloeocystidia of a quite different shape and size and smaller basidiospores that are ellipsoidal to subglobose rather than obovoid. Another similar species, known only from Colombia, is *A. andinus* Núñez & Ryvarden, but it has smooth basidiospores.

According to Núñez & Ryvarden (1997) many species of *Aleurodiscus* are restricted to one or a few related hosts. To date six species are known from eucalypts: *A. australiensis* (Cunningham 1963), *A. botryosus* (Cunningham 1963), *A. dextrinoideocerrussatus* Moreno, Blanco & Manjón (1990), *A. lacunae-euimortui*, *A. mirabilis* (Berk. & M.A. Curtis) Höhn. (Cunningham 1963), and *A. sparsus* (Berk.) Höhn. & Litsch. (Cunningham 1963). Only *A. lacunae-euimortui* and *A. sparsus* are known only from eucalypts. A search in the Thredbo area for *A. lacunae-euimortui* on *E. niphophila*, which some taxonomists consider to be a subspecies of, or conspecific with, *E. pauciflora* was not successful.

### Key to the species of *Aleurodiscus sensu lato* known from Australia and New Zealand

- |   |  |
|---|--|
| 1. Generative hyphae with simple septa .....  | 2  |
| 1'. Generative hyphae with clamps .....   | 11   |
| 2. Basidiospores smooth .....   | 3  |
| 2'. Basidiospores ornamented .....  | 7  |
| 3. Acanthophyses absent .....   | 4  |
| 3'. Acanthophyses present .....   | 5  |
| 4. Skeletocystidia present, to 150 × 10 µm, thick-walled, hyaline .....   | <i>A. parmiformis</i> G. Cunn.               |
| 4'. Skeletocystidia absent .....  | <i>A. limonisporus</i> D.A. Reid             |
| 5. Basidiospores 7–9 × 4–5 µm, subcylindrical .....   | <i>A. aberrans</i> G. Cunn.                  |
| 5'. Basidiospores larger .....  | 6  |
| 6. Basidiospores 9–12 × 4–4.5 µm, subcylindrical; gloeocystidia 80–160 × 14–18 µm, hyaline, becoming thick-walled ..... | <i>A. berggrenii</i> (Cooke) G. Cunn.        |
| 6'. Basidiospores 12–15 × 7–10 µm, oval; gloeocystidia 30–60 × 8–12 µm, becoming yellow, thin-walled .....              | <i>A. apricans</i> Bourdot                   |
| 7. Acanthophyses absent .....   | 8  |
| 7'. Acanthophyses present .....   | 10   |
| 8. Dendrohyphidia few, sparsely branched; gloeocystidia absent .....  | <i>A. amorphus</i> (Pers. : Fr.) J. Schröt.  |
| 8'. Dendrohyphidia numerous, very branched, gloeocystidia present .....   | 9  |
| 9. Gloeocystidia short cylindrical to ventricose, usually mamillate .....   | <i>A. aurantius</i> (Pers. : Fr.) J. Schröt. |
| 9'. Gloeocystidia cylindrical to sub-moniliform, not mamillate, if thick-walled then often transversely septate .....   | <i>A. lacunae-euimortui</i>                  |
| 10. Acanthophyses cylindrical to clavate, the apices amyloid .....  | <i>A. botryosus</i> Burt                     |
| 10'. Acanthophyses ovate to fusiform, the apices not amyloid .....  | <i>A. apricans</i> Bourdot                   |
| 11. Gloeocystidia absent .....  | <i>A. coralloides</i> G. Cunn.               |
| 11'. Gloeocystidia present .....  | 12   |
| 12. Basidiospores >24 µm long .....   | 13   |
| 12'. Basidiospores <24 µm long .....  | 14   |

13. Basidiospores 25–36 × 16–20 µm, oblong-ellipsoidal; acanthophyses in dense palisade, coralloid ..... *A. sparsus* (Berk.) Höhn & Litsch.  
 13'. Basidiospores 24–30 × 15–20 µm, obovate, citriform; acanthophyses scattered, cylindrical ..... *A. zealandicus* G. Cunn.
14. Acanthophyses coralloid; gloeocystidia apex spinous ..... *A. coronatus* G. Cunn.  
 14'. Acanthophyses cylindrical to clavate; gloeocystidia apices not spinose but sides may be sparsely spinose ..... 15
15. Acanthophyses coralloid; gloeocystidia 60–250 × 7–12 µm, flexuous, abundant .... *A. ochraceoflavus* Lloyd  
 15'. Acanthophyses cylindrical, subclavate to clavate; gloeocystidia 35–86 × 6–22 µm, shape variable, crowded .  
 ..... *A. australiensis* Wakef.

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