

Redisposition of *Chlorosplenium chrysotrichum* to the genus *Dicephalospora* (Sclerotiniaceae, Ascomycota)

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A detailed description is given for *Chlorosplenium chrysotrichum* based on material recently collected in New Zealand, which was compared with older herbarium specimens including type material of *Peziza chrysotricha* from Berkeley's herbarium in Kew. The conspicuous, orange apothecia with thin, hairy receptacles emerge from the bark of the host *Nothofagus*. On the basis of structure of the excipulum, asci and ascospores it was found that *P. chrysotricha* belongs in the genus *Dicephalospora*. Therefore the new combination is proposed. A key to the species of *Dicephalospora* is provided.

Keywords: *Dicephalospora chrysotricha*, key, Sclerotiniaceae, new combination.

During a visit to the North Island of New Zealand in January and February 2003, interesting discomycetes were collected on a foray in the Tongariro National Park, on the foothills of Mt. Ruapehu. Among these were collections of *Chlorosplenium chrysotrichum* (Berk.) Dennis, an inoperculate discomycete with conspicuous brightly orange apothecia breaking through the bark of recently dead and rotten wood of *Nothofagus*. The species was originally described by Berkeley in 1855 as *Peziza chrysotricha*, and a more detailed description of the type was later given by Massee (1896). The generic classification of *P. chrysotricha* has been subject to debate (Saccardo 1889, Dennis 1961, Dixon 1974). Microscopic examination of new collections revealed that the ascospores are provided with polar muculaginous caps, a feature which is known for species of the genus *Dicephalospora* Spooner (1987). Other structures were also found to show similarities with members of that genus, but *P. chrysotricha* differs from all species thus far assigned to *Dicephalospora*. Type material of *Peziza chrysotricha* deposited in Berkeley's Herbarium in K was examined and found to be conspecific with the recent collections, which were used to provide a detailed description. Because it complies with the generic concept of

Dicephalospora, the name is here combined into that genus. All material was studied in water, Lugol's iodine solution (IKI) and Melzer's reagent (Mlz).

Material and methods

Attempts to culture the fungus by transferring hymenial and sterile tissues of recently collected and gently dried material on malt extraction and potato dextrose agar were unsuccessful. Measurements were taken from rehydrated, non-turgescient (NT) material in water, and drawings were made with a drawing tube. The recently collected specimens have been deposited in the New Zealand Fungal Herbarium (PDD) of Landcare Research, Auckland.

Taxonomy

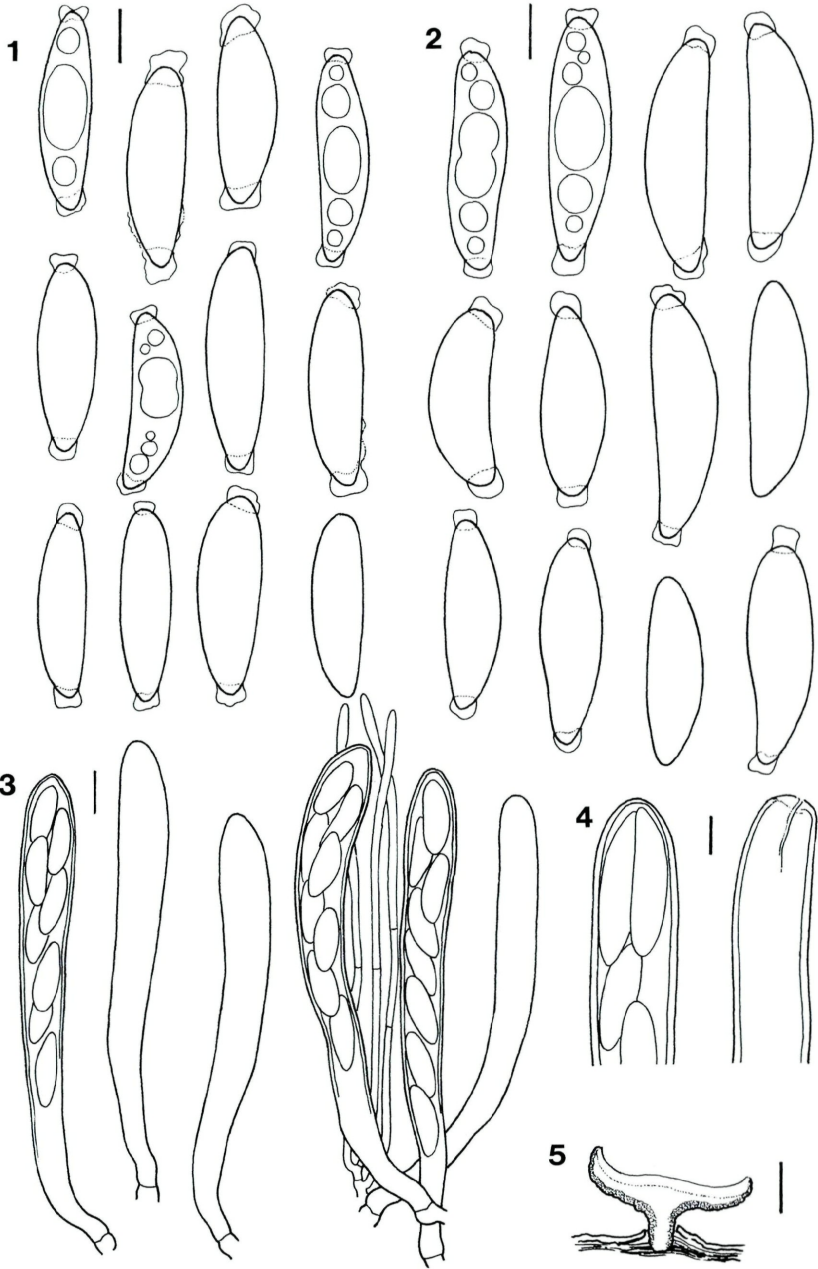
Dicephalospora chrysotricha (Berk.) Verkley, **comb. nov.** Figs 1–5.

Peziza chrysotricha Berk., Bot. antarct. voy. II, Fl. nov.-zel. 2: 201. 1855.

Trichopeziza chrysotricha (Berk.) Saccardo, Syll. Fung. 8: 411. 1889.

Chlorosplenium chrysotrichum (Berk.) Dennis, Kew Bull. 15: 313. 1961.

Apothecia scattered, erumpent from stromatized inner layers of the bark of the host. – Disc concave or flat, circular, smooth, pale orange-yellow and up to 5 mm diam when moistened, and orange to orange-brown, 1–3.5 mm diam and laterally enfolded when dry. – Receptacle cupulate, relatively thin, the surface clothed with hair-like hyphal extensions, intensely orange when dry. – Stipe central, relatively thin, orange, somewhat darker or black towards the base. – Ectal excipulum 25–50 μ m thick, golden yellow to orange, in the upper part of the receptacle composed of isodiametric, irregular cells 5–10 μ m diam, downwards transformed into septate, undulating hyphae with hyaline, refractive walls thickened up to 2 μ m and enclosing golden yellow particles, the outermost cells also giving rise to thin, tightly appressed, septate hair-like hyphae 20–50 \times 3.5–5 μ m, with orange incrustations on the surface. – Medullary excipulum up to 200 μ m thick near the stipe, hyaline to pale yellow, almost entirely composed of tightly interwoven, hyaline hyphae 2.5–4 μ m wide, in the lower part with somewhat thickened walls. – Asci 8-spored, cylindrical-clavate, apex conical-rounded, the walls thickened up to 1 μ m, the wall in the top somewhat thinner, not blueing in iodine (IKI-, Mlz-), opening by an irregular tear at the apex, gradually narrowed towards the base, croziers present, 95–120(–130) \times 10–14 μ m (NT, water; in the type 90–100 \times 11–12 μ m cf. Massee, 1896: 517; 75–96 \times 8–12 μ m cf. Dixon, 1974). – Ascospores inaequilateral, broadly-fusoid to ellipsoid, lower end



Figs. 1–5. *Dicephalospora chrysotricha* (in water). – 1, 2. Ascospores. – 3. Asci and paraphyses. – 4. Ascus tips before and after dehiscence. – 5. Section through apothecium. Scale bars 1, 2, 4 = 5 μ m; 3 = 10 μ m; 5 = 0.5 mm. – 1, 3–5, from PDD 78708, G. V. 1886, 2 from PDD 78710, G. V. 1874.

slightly pointed, upper end usually more rounded, hyaline, non-septate, smooth, thin-walled, containing 3–5 guttules, $14\text{--}21.5\text{--}(23) \times 4\text{--}6.5 \mu\text{m}$ (av. \pm SE: $18.8 \pm 0.3 \times 5.6 \pm 0.1$, $N=50$; in the type $19\text{--}20 \times 5 \mu\text{m}$ cf. Masee, 1896; $14\text{--}17 \times 4\text{--}5 \mu\text{m}$ cf. Dixon, 1974), each end capped by an obconical to irregular mucilaginous appendage. – Paraphyses filiform, septate, obtuse, the upper cell slightly inflated just below the blunt tip, hyaline, smooth-walled, $2\text{--}2.5\text{--}(3) \mu\text{m}$ wide.

Specimens examined. – New Zealand: North Isl., Waikare Lake, Colenso, 1843 [K (M) 118145, TYPE of *Peziza chrysotricha* Berk.]; South Isl., Nelson distr., Reefton, on dead twigs of *Nothofagus fusca*, S. D. Baker, 1 Dec. 1952 [K (M) 118147, sub *Chlorosplenium*, ex Auckland PDD 19408]; North Isl., Wellington distr., on rotting twigs, E. J. Butler, 27 Jul. 1923 [K (M) 118146, sub *Chlorosplenium*]; North Isl., Taupo distr., Tongariro Nat. Park, near Whakapappa, Taranaki Falls track, alt. 1400 m, on dead, attached branch of *Nothofagus solandri* var. *cliffortioides*, G. V. 1886, 26 Jan. 2003 (PDD 78708); Same area, Silica Rapid track, alt. 1400 m, on dead, attached branch of *Nothofagus solandri* var. *cliffortioides*, G. V. 1874, 25 Jan. 2003 (PDD 78710); Same area, Taranaki Falls track, alt. 1400 m, on dead, attached twigs of *Nothofagus solandri* var. *cliffortioides*, G. V. 1887a, 26 Jan. 2003 (PDD 78709).

Discussion

Saccardo (1889) combined *Peziza chrysotricha* into *Trichopeziza* Fuckel, in which he classified several unrelated *Hyaloscyphaceae* with continuous ascospores. Dennis (1961) referred *P. chrysotricha* to *Chlorosplenium* De Not., although he already indicated that ‘its systematic position still presents some difficulty’, as the inamyloid asci and broadly fusoid ascospores were rather atypical for *Chlorosplenium*. Dixon (1974) excluded the fungus from *Chlorosplenium*, but was uncertain about its generic disposition.

This beautiful species is primarily characterized by inamyloid asci, which have evenly thickened lateral and apical walls or a slightly thinner apical wall, and mucilaginous caps over the ends of the ascospores. These caps are consistently present on free, mature spores, but are easily overlooked, particularly in Melzer’s reagent. The type specimen of *Peziza chrysotricha* contains only a fragment of a single apothecium. The spore caps are very delicate, and I could not observe them in the slide of the type made by Dixon (1974), which was enclosed in the package of the type. In the other herbarium specimens from K, I was also unable to observe them, but the apothecia were relatively young or immature. However, Dixon’s slide gave sufficient information to confirm the identity of the type with the more recent material. Other notable characters of *D. chrysotricha* which were not mentioned by previous authors include the septate, hyaline thick-walled hyphae of the lower ectal excipulum,

and the dark stroma which is hidden within the host tissues and from which the apothecia emerge. The base of the stipe is often also blackened. All these characters point towards the genus *Dicephalospora* of the family *Sclerotiniaceae* (Spooner, 1987). Spooner included two species when he proposed the new genus *Dicephalospora*. Recently, Zhuang (1999) described two new species from China, *D. damingshanica* W. Y. Zhuang and *D. pinglongshanica* W. Y. Zhuang.

Dicephalospora chrysotricha is noted for the intense orange colour of its receptacle, and the conical-rounded, inamyloid ascus apices which lack an apical pore. The hair-like projections on the surface of the receptacle, for which the species was named, have not been reported for other *Dicephalospora* species. They may be poorly developed or completely wanting in some apothecia. *Dicephalospora calochroa* (Syd.) Spooner, the type species of *Dicephalospora*, is paler in colour than *D. chrysotricha*, has larger asci (165–185 × 14–15 µm) which are provided with a faintly blueing apical pore within a broadly papillate apex, and larger ascospores [23–27(–29) × 6.5–7.5 µm]. In *D. rufocornea* (Berk. & Br.) Spooner asci are also larger (140–180 × 12–18 µm) with amyloid papillate apices, while the ascospores are narrowly fusoid and much longer [(27–)32–39 × 4–5.5 (–6) µm, Spooner, 1987; 28–50 × 4–5 µm, Raitviir & Shin 2003]. In *D. damingshanica*, the asci are weakly amyloid and 165–185 × 16–20 µm, while the ascospores are again larger (22–32 × 9–12.7 µm) than those of *D. chrysotricha*. The apothecia of *D. pinglongshanica* are much smaller (0.3–0.6 mm), while the ascospores are longer (20–28 × 4.5–5.7 µm; Zhang 1999). The asci of this species are described as having a truncate, non-papillate, inamyloid apex.

Key to the species of *Dicephalospora*

- 1. Ascospores limoniform, over 8 µm wide (average L/W ratio <2.5)
..... *D. damingshanica*
- 1. Ascospores fusoid, less than 8 µm wide (average L/W ratio >2.5)
..... 2
- 2. Ascus apices papillate, thickened, amyloid 3
- 2. Ascus apices conical-rounded or truncate, not thickened, inamyloid or very faintly blueing in iodine 4
- 3. Asci 165–185 × 14–15 µm, ascospores 23–27(–29) × 6.5–7.5 µm
..... *D. calochroa*
- 3. Asci 140–180 × 12–18 µm, ascospores 28–50 × 4–6 µm
..... *D. rufocornea*

4. Apothecia 0.3–0.6 mm diam, ascospores 20–28 µm long.
. *D. pinglongshanica*
4. Apothecia 1.0–3.5 mm diam, ascospores 14–21.5(–23.0) µm long . .
. *D. chrysotricha*

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