**Coniochaeta polymegasperma** and **Delitschia trichodelitschioides**, two new coprophilous ascomycetes

M. J. RICHARDSON

165 Braid Road, Edinburgh EH10 6JE, U.K.

**Coniochaeta polymegasperma** sp. nov. is described from hare dung from Sutherland, Orkney and Inverness. With 64-spored asci, it differs from other *Coniochaeta* spp. with asci with more than eight spores by its much larger spores. *Delitschia trichodelitschioides* sp. nov. is described from hare dung from Sutherland and Inverness, differing from other *Delitschia* spp. in its distinctively setose pseudothecial neck.

While examining dung samples from Orkney, as a contribution to a survey of Orcadian fungi being conducted by the Royal Botanic Garden, Edinburgh, a *Coniochaeta* with 64-spored asci was observed on dung of the mountain or blue hare (*Lepus timidus* L.) which could not be identified as a described species. Samples were collected and dried on 16 Aug. 1992, and rehydrated and incubated in Aug. 1996. Perithecia were found within a day or two of rehydration, so it is assumed that the fungus had already developed on the pellets in the field when collected. There was no new growth of the fungus on incubation, and a complete description could not be obtained. The fungus was collected again in 1997 on mountain hare dung collected in Sutherland. It also was present when collected, and developed to provide good material on incubation.

**Coniochaeta polymegasperma** M. J. Richardson, sp. nov.

(Figs 1–4)

Etym.: from the combination of asci with more than eight spores and relatively large spores


Perithecia solitary, immersed, globose, 175–330 µm diam., translucent brownish olive below, with much darker opaque neck 50–90 µm long, 65–110 µm diam. Neck with tapering subacute setae up to 35 µm long x 4–5 µm diam. at their base, sometimes much shorter and relatively infrequent. Asci clavate, 160–200 x 35–45 µm, 64-spori. Spores very dark brown, discoid, 13–16.5 x 9.5–13.5 x 5.5–9 µm, with germ slit around the circumference.


Mahoney & LaFavre (1981), in discussing substrate preference and number of spores, noted that there are four

Figs 1–4. *Coniochaeta polymegasperma*. Fig. 1. Outline of perithecia. Fig. 2. Detail of perithecial neck and setae. Fig. 3. Ascus and spores. Fig. 4. Ascospores.
multi-spored Coniochaeta species (i.e. those with more than eight spores in an ascus), all of which have been reported only from dung. They are C. philocopioides (Griffiths) Cain (32-spored asc), C. hansenii (Oudem.) Cain (64–128), C. polysperma Furrya & Udagawa (512), and C. multispora Cain (1000 + ). None of the spores of these exceeds 10 μm in their largest dimension. Those of C. hansenii, the nearest in terms of number of spores, are variously reported as 7–9 μm diam., discoid (Oudemans, 1882), 7–9 × 4–7 μm (Cain, 1934), 7–9 × 7–9 × 4–7 μm (Dennis, 1978), 7–10 × 5–6 × 4.5 μm (Bell, 1983), 7.5–9.5 × 4.5–7 × 4–6.5 μm (Checa et al., 1988) and 6.5–8.3 × 5–7 × 3.75–4.5 μm (Richardson, six collections, unpublished). In comparison, those of C. polysperma are 13–16.5 × 9.5–13.5 × 5.5–9 μm. An additional point of distinction is in the length of the setae, which are up to 35 μm long in C. polysperma, whereas those of C. hansenii are much longer, up to 120 × 6.5 μm.

Given the known occurrence of C. polysperma it may be that it is not particularly rare on the dung of mountain hare in north temperate latitudes, but that its discovery has been delayed by the relative infrequency with which that substrate is collected and incubated. Another collection was made on mountain hare dung collected on Cairngorm (27 May 1997, NH9804; A. Henrici, pers. comm.), 3 km distant from and 150 m higher than the Coire na Ciste collection. It was not observed on sheep, red deer or red grouse dung collected and incubated, and after intensive inspection D. trichodelitschioides was found on at least eight, and possibly more, types of dung. In this recent study 176 samples have been examined, 89 from lagomorphs (74 rabbit, 15 hare), and the remainder from other animals, mostly sheep (26), red grouse (19), ptarmigan (17), cow (12) and horse (4). C. lignarea was the most frequent Coniochaeta, occurring on 20% of lagomorph and 17% of non-lagomorph samples. The frequency of C. scatigena was 15 and 14%, respectively. The small differences in frequency of these two species on different dung types are not significant ($\chi^2 = 1.09 \quad [P = 0.30], \quad C. \ lignarea; \chi^2 = 0.02 \quad [P = 0.87], \quad C. \ scatigena$).

A Delitschia was also observed on the Suilven hare dung which, with its distinctly setose pseudotheia, did not match the description of any described species. Superficially, in pseudotheial structure and spore size, it closely resembles Trichodelitschia bisporula (P.Crouan & H. Crouan) Munk, but the longitudinal germ slits, rather than apical germ pores, clearly place it in Delitschia.

**Delitschia trichodelitschioides** M. J. Richardson, sp. nov. (Figs 5–7)

Etym.: from the resemblance to Trichodelitschia Ascomata pseudothecia (100–) 150–300 μm × 100–200 μm diam., solitaria, immersa, pyriformia vel globosa, atrobrunnea, deorsum pilis flexuosis brunneis. Collum 30–50 μm altum et 45–65 μm diam., nigrum, setosum. Sætas atrobrunes vel nigris attenuatis acutis, usque ad 120 μm longis et 3–3.5 μm diam. Asci bitunicati, octospori, clavati, 60–75 × 22–26 μm ante rumpentes, 100–165 × 14–16 μm post rumpentes. Ascospore (19.5–) 22–28 (–32) × 7–9.5 μm, bruneae, strato mucoso hyalino in aqua tumescenti. Cellulae ascoporum hemiellipsoidae vel parum attenuatae ad apicem, similares vel leniter asymmetricae, prima leviter brevior et magis attenuata quam altera, fissura germinali recta, longitudinalini. Pseudothecia solitary, immersed, pyriform to globose, (100–) 150–300 μm high, 100–200 μm diam., dark brown, with brown flexuose hairs below, and very dark neck 30–50 μm high × 45–65 μm diam. Neck with very dark brown/black tapering, acute setae, inserted at various angles, up to 120 μm long × 3–3.5 μm diam. at their base. Ascii bitunicate, 8-spored, clavate, 60–75 × 22–26 μm before rupture of outer layer, 100–165 × 14–16 μm after expansion. Spores brown, 2-celled, (19.5–) 22–28 (–32) × 7–9.5 μm, with clear sheath expanding to 3–5 μm in water. Cells of spores hemiellipsoid to slightly tapered towards the apex, symmetrical about the septum to slightly asymmetrical with one cell slightly shorter and more tapered than the other. Germ slit parallel to the long axis.

**Holotype:** On blue hare dung (Lepus timidus L.) dung, Suilven, Sutherland, U.K. (NC186154), M. J. Richardson, 17 Jun. 1997. IMI 376334.

**Other specimens examined:** On blue hare dung, Coire na Ciste, Cairngorm, Inverness, U.K. (N001069), M. J. Richardson, 28 May 1997.

It is interesting to note that D. trichodelitschioides was found on the same sample as the other new species described in this paper, and sometimes on the same pellet, with other Coniochaeta spp. and Trichodelitschia bisporula. Twenty pellets were incubated, and after intensive inspection D. trichodelitschioides was found on at least eight, and C. polysperma on six, with two occurrences of both on the same pellet. Other Coniochaeta spp. were more prevalent, both in the number of pellets on which they occurred and in the number of perithecia produced.

![Figs 5–7. Delitschia trichodelitschioides. Fig. 5. Outline of pseudotheia. Fig. 6. Expanded ascus and spores. Fig. 7. Ascospores.](image)
I am grateful to Dr Nils Lundqvist for commenting on the original Orkney material of *C. polymegasperma* and to Drs Paul Cannon and Brian Coppins for assistance with the Latin diagnoses.

REFERENCES


(Accepted 29 October 1997)