

NOTES ON THE COPROPHILOUS PYRENOAMYCETE  
SPORORMIA FIMETARIA

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*Sporormia fimetaria* is briefly redescribed, mainly based on material from Greenland. Comments are given on hitherto unnoticed details, viz. nomenclature, excipulum anatomy, spore morphology, and distribution.

While about 200 pyrenomycetes growing on herbaceous plants and trees have been known from Greenland for about 100 years (Rostrup, 1888, 1894, and 1904), only very little is known about coprophilous pyrenomycetes from this area. From studies of species of Pezizales on dung samples collected during field work in Greenland in 1981, 1982, 1983, and 1987 (cf. Dissing, 1989), and besides of a number of samples made available by co-operative geologists and ornithologists working in Greenland, it has become very clear that also a great number of interesting coprophilous pyrenomycetes deserves attention. In the present investigation the opportunity is taken to present a *Sporormia* described in 1844, which apparently has a very wide distribution, but for which some details on nomenclature, anatomy, and spore-morphology have escaped the notice of mycologists for about 150 years.

MATERIALS AND METHODS

In Greenland *Sporormia fimetaria* has mainly been isolated from fresh summer dung of musk-ox, which was air dried in the field laboratory and later incubated in moist chambers at room temperature, normally in late autumn or in winter after sampling. Ascocarps normally developed two to three weeks after incubation. In one case ascocarps developed on a dung sample preserved for four years in the laboratory (Danmarks Havn).

In order to study the anatomy of the excipulum, ascocarps were sectioned on an ultramicrotome. Dried material was rehydrated overnight in water and then fixed in 2.5% glutaraldehyde in 0.1 M phosphate buffer at pH 7.0. The material was dehydrated according to the method described by Feder & O'Brien (1968) before embedding in glycol methacrylate in three steps. Sections 1.5  $\mu\text{m}$  thick were cut on a Reichert-Jung Supercut microtome (Fig. 2) with a glass knife and stained with periodic acid-Schiff reagent (PAS) and aniline blue black. Sections were finally embedded in DPX.

The material is deposited in the Botanical Museum, Copenhagen (C), if not otherwise stated.

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**Sporormia fimetaria** (De Not.) De Not.—Figs. 1–5

Ascocarps globose or subglobose, superficial or partly immersed in the dung, 130–185  $\mu\text{m}$  broad, thin-walled, membranaceous, glabrous, first pale yellowish-brown, when mature dark brown; excipulum of one layer (Fig. 2), individual cells rather large (Fig. 3), 4–6 angular, 10–17  $\mu\text{m}$  broad, 3–5  $\mu\text{m}$  thick. No neck, nor opening seen.

Asci 50–70  $\times$  10–13  $\mu\text{m}$ , cylindrical, rounded above, below with a short stalk; paraphyses not seen; spores firmly united like a corn cob, first hyaline all over, later dark brownish on the outside, remaining pale on the inside, 40–55  $\times$  3–3.5  $\mu\text{m}$ , 16-celled, with pointed, gelatinous, hyaline, 30–40  $\mu\text{m}$  long appendages from both poles of each spore (Figs. 4 and 5). The spores mature nearly simultaneously. When enclosed in the ascus the appendages are closely packed and hardly visible; when the spores are liberated they remain united in the cob, but the appendages are seen to be suddenly stretched. Neither germ-slits, nor a common gelatinous covering are seen.

**Habitat.**—On dung of musk-ox, reindeer, roe-deer, and sheep.

**Specimens examined.**—CANADA: Ellesmere Island, Sverdrup pass, 79°09'N, 79°39'W, musk-ox dung, *L.M. Kohn*, VIII.1984, moist chamber 11.III.1985, with *Ascobolus groenlandicus*, *Iodophanus difformis*, *Schizothecium* sp., EI 85.99 (C). — GREENLAND: The head of Kangerdlugssuaq (Søndre Strømfjord), 67°02'N, 50°33'W, dung of reindeer, VIII.1987, *H. Gøtzsche*, moist chamber 10.XII.1987, with *Dicryostelium* sp., *Saccobolus* sp., *Melanospora funicola*, G. 87.201 (C); Igaliko, 61°10'N, 45°25'W, dung of sheep, VIII.1981, moist chamber, five samples, 2.XII–9.XII.1981, G. 81.193 (C), G. 81.194 (UPS), G.

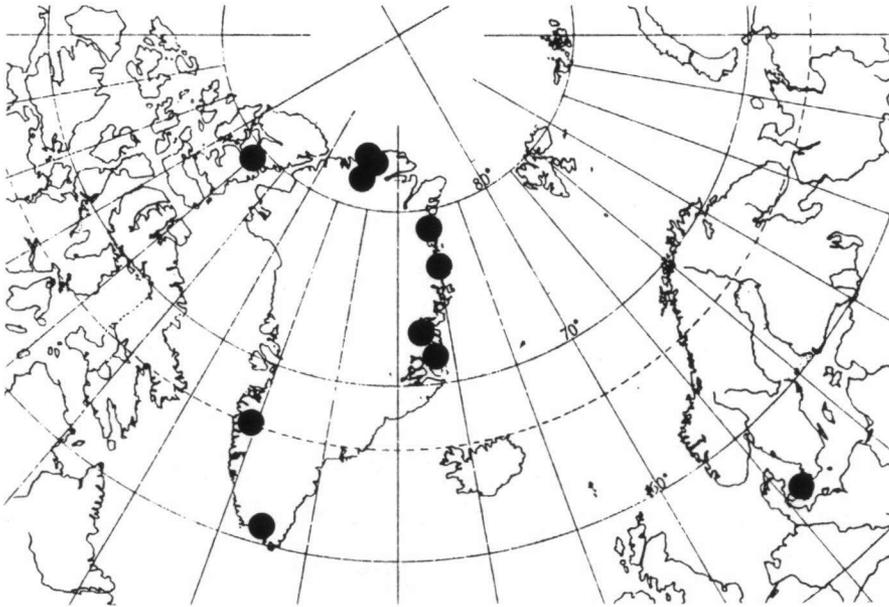


Fig. 1. Map showing the position of the localities from which material has been studied in the present investigation.

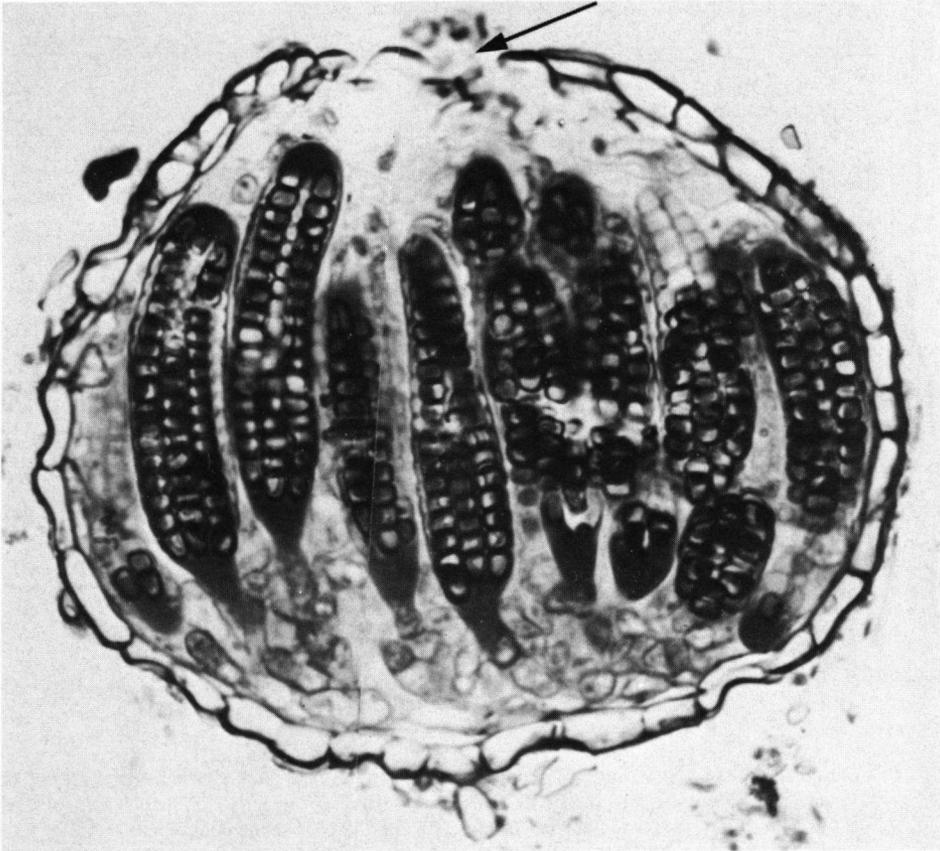


Fig. 2. Section of ascocarp with one-layered excipulum. Arrow indicates a possible 'ostiole'. Note that all spores are mature. One ascocarp may contain between 20–60 asci. Gr. 85.03 (C),  $\times 775$ .

81.195 (C), with *Ascobolus groenlandicus*, G. 81.200 (L), with *Melanospora fimicola*, *Coprinus miser*, G. 81.201 (C); Jamesonland, Ørsteddalen, 71°45'N, 23°30'W, old musk-ox dung, VII.1982, D. Boertmann, moist chamber 4.II.1983, with *Ascobolus groenlandicus*, G. 82.333 (C); Ella Island, 72°50'N, 25°W, fresh musk-ox dung, VIII.1982, moist chamber 16.I.1983, with *Ascobolus groenlandicus*, *Coprinus stercoreus* sensu Orton & Watling, G. 82.342 (C); Danmarks Havn, 76°46'N, 18°48'W, fresh musk-ox dung, VIII.1984, B. Lauritsen, moist chamber II.1985, G. 85.03 (C), G. 85.04 (C), with *Ascobolus groenlandicus*, G. 85.06 (C); Ibid. Hvalrosodden, 45 km NW of Danmarks Havn, fresh musk-ox dung, B. Lauritsen, IX.1984, moist chamber 5.II.1988, with *Ascobolus groenlandicus*, *Iodophanus* sp., *Sporormiella* sp., *Dictyostelium* sp. (s.n., CBS); Lambert Land, 79°30'N, 21°09'W, fresh dung of musk-ox, VII.1990, B. Fredskild, moist chamber 20.XI.1990, together with *Ascobolus sacchariferus*, *Ascobolus groenlandicus*, *Sporormiella intermedia*, G. 90.01 (C); Nares Land, 81°55'N, 44°40'W, fresh dung of musk-ox, VIII.1984, J. Peel, moist chamber 7.XII.1984, GP. 84.03 (C); Peter Freuchen Land, 82°45'N, 43°W, fresh dung of musk-ox, VIII.1985,

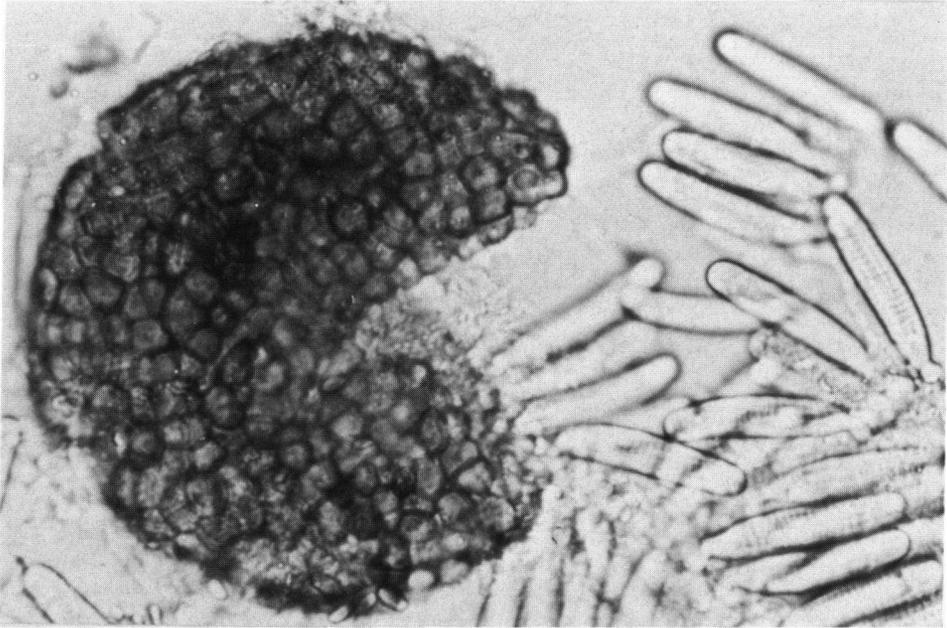


Fig. 3. Ascocarp in water, surface view. Note that all asci are immature. Gr. 81.193 (C),  $\times 500$ .

*J. Peel*, moist chamber 10.IV.1986, with *Ascobolus groenlandicus*, GP. 86.06 (C); Borup Island, 83°01' N, 42°45' W, fresh dung of musk-ox, VIII.1985, *J.D. Friederichsen*, moist chamber 2.I.1986, with *Melanospora fimicola*, GF. 86.02 (C). — DENMARK: Sjælland, Ganløse, 55°50' N, 12°15' E, on dung of roe-deer, IV.1969, *K. Larsen*, moist chamber 19.V.1969 (Four slides, C).

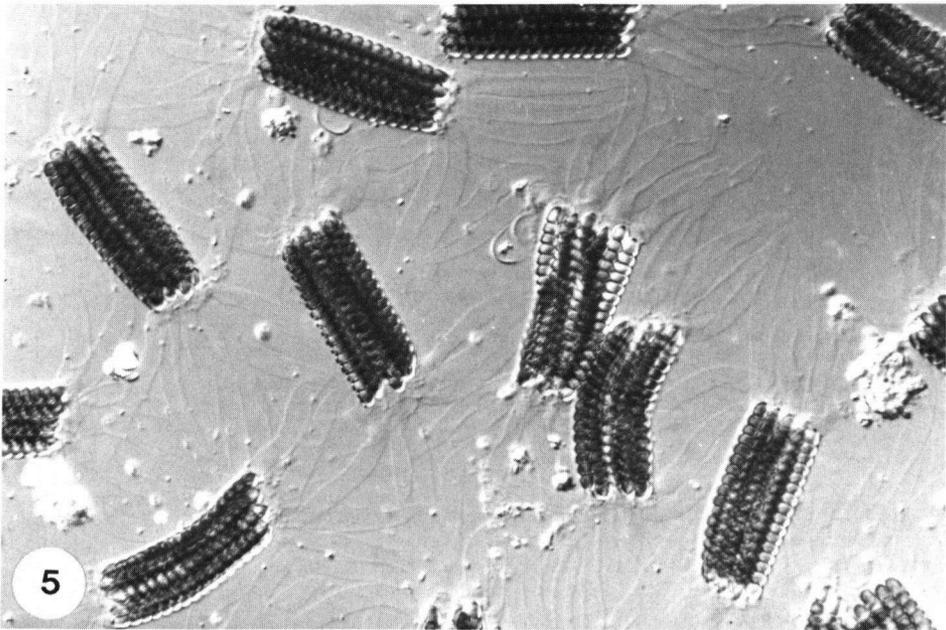
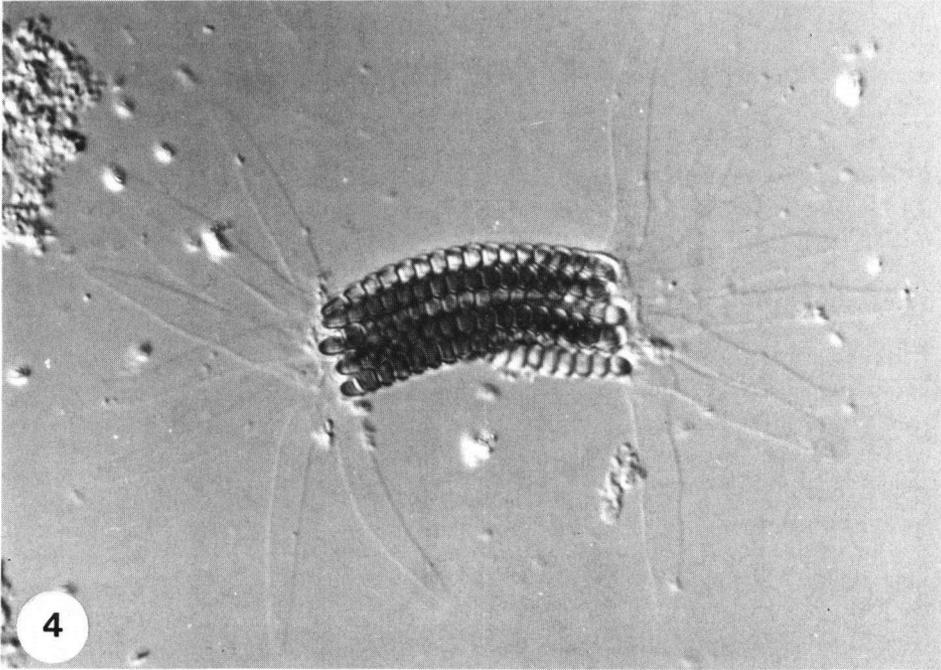
Distribution of the examined material is shown in Fig. 1.

*Sporormia fimetaria* was originally described by De Notaris (1844) as *Hormospora fimetaria*. However, *Hormospora* is illegitimate since it is a later homonym of *Hormospora* Bréb. (de Brébisson, 1839), which is an alga. Article 68 of the International Code of Botanical Nomenclature (Greuter & al., 1988) states that 'a specific name is not illegitimate merely because its epithet was originally combined with an illegitimate generic name ...', and hence the correct citation of the species is *Sporormia fimetaria* (De Not.) De Not. (1849). *Hormospora fimetaria* De Not. (1844) is its basionym.

Sections of ascocarps (Fig. 2) showed the membranaceous wall to be one-layered. Neither definite ostioles, nor protruding asci have been seen. In Figure 2 the broken area (arrow) may constitute an ostiole. Also a *Sporormiella* has been sectioned (unpublished). Sections showed

Fig. 4. Ascospore in water. Leitz interference contrast light microscopy. Gr. 81.201 (C),  $\times 1000$ .

Fig. 5. Ascospores in water. Leitz interference contrast light microscopy. Gr. 81.201 (C),  $\times 600$ .



a wall of several layers and a definite ostiole. The cohering spores of *S. fimetaria* with the very characteristic pointed, gelatinous appendages indicate a typical coprophilous spore dispersal, like *Saccobolus* in Pezizales. The gelatinous appendages have never before been mentioned, nor depicted in literature. Nils Lundqvist, Stockholm (in litt.) has kindly informed me that he has seen the same appendages on material of *S. fimetaria* from Scotland, Iceland, and Sweden. *Sporormia fimetaria* may have a world wide distribution. The type, which has not been studied, was described from material from Italy. Ahmed & Cain (1972) examined material from Canada, Mexico, and United States. Bell (1983) mentioned it from New Zealand.

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