

thick hairs, and abundantly set on the neck with rigid, 1-2-septate, light brown, cylindrical, obtuse, non-agglutinated hairs, $25-120 \times 3-3.5 \mu$. *Peridium* pseudo-parenchymatous, membranaceous, semi-transparent, yellowish to light brown with an olivaceous tint, except in the black, opaque neck, 3-layered; outer layer composed of angular, irregularly shaped, thin-walled cells, $5-10 \mu$ in diam., middle layer of large, tangentially flattened, hyaline cells. *Paraphyses* short and stout, simple, soon collapsing, composed of a few large, elongated, vesicular cells. *Asci* rather few, c. 100-128-spored, $265-310 \times 60-90$ (-110μ , broadly clavate, with a moderately long stipe and a tapering apex, unitunicate, non-amyloid, easily bursting, costate after dehiscence; subapical chamber c. 2μ broad; no apical ring or light-refractive membranes. *Spores* multiseriate, forming together a fusiform body, at first one-celled, hyaline, cylindrical, then somewhat dumb-bell-shaped, then swelling above, finally becoming transversely uniseptate; upper cell ranging from olivaceous, light brown to dark brown, smooth, $18-24 \times 13-15 \mu$, broadly fusiform, equilateral, with an apical germ pore and sometimes with a small septal pore too; pedicel $11-18 \times 6-7 \mu$, cylindrical to slightly obclavate, hyaline, devoid of plasma, at last collapsing. Whole spore, including the pedicel, surrounded by a $1.5-3 \mu$ thick *gelatinous layer* that is apically and basally drawn out into appendages; upper cauda $30-50 \times 3-5 \mu$, composed of two subapically attached filaments that are free from each other (bifid) below, but mostly fusing distally into a cylindrical or tapering part; basal cauda cylindrical, $30-50 \times 3 \mu$, not divided; all cauda solid, round in cross-section, without visible microstructure, persistent, not or little swelling in water; all gelatinous equipment blackening in Indian ink. — Fimicolous.

Holotype on goat dung from Ribeira do Taborada, W of Casa das Queimadas, Madeira, 28.I.1969, Tibell 3628-c (UPS); isotypes in IMI and TRTC.

PARATYPES: **Sweden:** *Sk*, Jonstorp, Svanshall (r) 1963, J 1664-e (NY slide, UC slide, UPS).

Madeira: same data as above, T 3629-e (UPS). — Lombo dos Pecegueiros, NW of Caldeirão Verde (gt) 1968, T 3665-j (E slide, S slide, UPS).

Most typical for this species are the rigid hairs on the perithecium, the multi-spored asci, and the bifid base of the upper cauda of the spore. The gelatinous equipment, especially the sheath, is rather difficult to see without treatment in Indian ink. Its configuration is very similar to that of *P. granulostriata*, which, however, is a larger species in all respects. I have been very uncertain whether *P. platensis* might be identical with *P. bifida*. Even after a study of the poor authentic remains of the former (p. 144), its morphology is still in some essential respects rather difficult to clear up. But it seems that the following differences are sufficient to distinguish the two species: *P. platensis* has agglutinated hairs, a thinner pedicel, and possibly another type of gelatinous equipment.

17. *Podospora curvicolla* (Wint.) Niessl 1883: 156 (Fig. 35, pl. 31 c, e)

Sordaria curviolla Wint. 1871: 161. — Coll. orig. on rat dung from Öderan, Saxony, Germany, autumn 1871, leg. Winter; not known to exist; Krieger, F. Sax. 33, 1885 (S neotype). — *Philocopra curvicolla* (Wint.) Sacc. 1882: 250. — *Pleurage curvicolla* (Wint.) O.K. 1898: 505. — *Bombardia curvicolla* (Wint.) Mig. 1912: 128.

? *Philocopra curvicolla* v. *penicillato-setosa* Mouton 1886: 145. — Coll. orig. on rabbit dung from Forêt, Gomzé, and Tilff in Liège, Belgium, s. dato, Mouton; non-existent.

Perithecia scattered, immersed, broadly obpyriform to globose, 480–575 × 385–500 μ , with a short, cylindrical neck, 145–280 × 145 μ , covered below with flexuous, light brown, septate, 2–2.5 μ thick hairs and on the neck with up to 430 μ long, slender, tapering tufts of rigid, agglutinated, cylindrical, septate, brown, c. 2.8 μ thick hairs. *Peridium* membranaceous, semi-transparent, thin, yellowish to light brown with an olivaceous tint, except in the black, carbonaceous neck; outer peridial cells angular, 5–11 μ in diam., with thin, straight or undulating walls. *Paraphyses* not observed. *Asci* (128?–) 256(–512?)-spored, 200–335 × 60–120 μ , clavate to saccate, short-stipitate; apex broadly rounded without apical ring or light-refractive membranes; subapical chamber not marked. *Spores* multiseriate, at first hyaline, rod-like, almost bacterioid, then swelling above and below becoming \pm dumb-bell-shaped and transversely uniseptate at the constriction; upper cell ranging through olivaceous to brown, ellipsoidal with subacute ends, equilateral, 14.5–17 × 9–11 μ , with an apical germ pore; pedicel obclavate, 6–8 × 2–3 μ , 1.5 μ wide at the septum, containing a little plasma but collapsing at maturity. A fairly short, lash-like *gelatinous cauda* attached to the apex of the spore head and the end of the pedicel, very fugacious, not blackening in Indian ink.

SPECIMENS EXAMINED; main substrate (ha): **Sweden:** *Sk*, Jonstorp, Svanshall (r) 1963, J 1664-q (UPS). — *Bl*, Åryd, Björkeholmen Isl. (r) 1963, N 1868-e, Exs. ined. (UPS). — Kristianopel, Mölleskär Isl. off Kristianopel (gs) 19.VIII.1968, K. & L. Holm (UPS slide) — *Sm*, Bolmsö, Hästhult, 1960, Lqt 2377-k (UPS). — *Gtl*, Kräklingbo, Mt. Torsburgen (r) 1959, Lqt 2116-b (UPS). — *Upl*, Husby-Sjutolft, Ekolsund (e) 1962, Lqt 3305-e (UPS); northernmost find, 59°39' N. New to Norden.

Scotland: Glasgow, Douglaston Estate, 1963, E 408 (O). — **The Netherlands:** *Utrecht*, Baarn, Groeneveld (r) 4.XI.1968, de Hoog (CBS 25969, UPS). — *Noord-Brabant*, Strijbeck, Gondbergen, 1954, Maas-Geesteranus 9977 (L 954017-172). — **Belgium:** *Hainaut*, Masnuy-St. Pierre (r) 1883, Marchal (BR); Marchal 1884b. — **Germany:** *Berlin*, Sydow, Mycoth. Germ. 121, 1904, under *Coniochaeta discospora* (Awd ex Niessl) Cain (UPS). — *Saxony*, Königstein, 1881–82, Krieger, F. Sax. 33, 1885 (G, M, NY, S neotype, WRSL); VIII.1882, Krieger (S), VII, VIII.1883 (M). — **Austria:** *Vienna*, 1915, Kupka (M); new to Austria. — **Poland:** *Szczecin* (=Stettin), Wolin Isl., Międzywodzie, 1965, N 3102-e (UPS). — *Silesia*, Niemodlin (=Falkenberg), 9.VII.1884, Schröter as *S. pleiospora* (WRSL); Schröter 1894. — **Hungary:** *Somogy*, Kaszó (r) Tóth 4330 as *Pl. setosa* (BP 37499); Tóth 1965. — **Italy:** s. loco et dato (r) [Spegazzini?] (PAD); Spegazzini 1878.

Canada: *Ontario*, Lake Timagami (porcupine) 1934, Cain 5117 (FH). — *Manitoba*, Clear Lake (porcupine) 1935, Bisby, hb. Cain 6585 (NY slide, UPS). — **USA:** *Connecticut*, West Haven (r) s. dato, Thaxter (FH 1164). — *Massachusetts*, Cambridge (mouse?) 7.XII.1886, Humphrey[?] (BPI). — *New York*, Cortland, near Scott (r) 1948, French & Rogerson 2636 (NY). — N.Y. City (h) x.1899, Griffiths (NY 4 slides); Griffiths 1901. — *Georgia*, Tifton (r) 24.IV.1932, under *Schiz.* n. sp., Shear as *S. fimicola* (BPI). — *Florida*, Coconut Grove (r) 1898, Thaxter as *P. setosa* (FH 2431).

UNVERIFIED RECORDS: over 60 finds are registered, the majority on leporid droppings from Europe and North America; also known from France, Bulgaria, Congo (Brazzaville), Indonesia, Mexico, and Brazil.

INCORRECT RECORDS: **Hungary:** Tóth 1965 are *A. leporinum* (Tóth 4656) and *P. granulostriata* (Tóth 4661). — **USA:** New York City (h I coll.) Griffiths 1901 is *P. setosa*.

CHOICE OF SUBSTRATE: 27 (>87) finds: on dung of hare 10, (Europ.) rabbit 7, (Amer.) rabbit 4, porcupine 2, elk, horse, mouse, goose; also recorded on dung of sheep, goat, cow, red deer, roe deer, camel, bear, and on stems of *Salsola pestifer*.

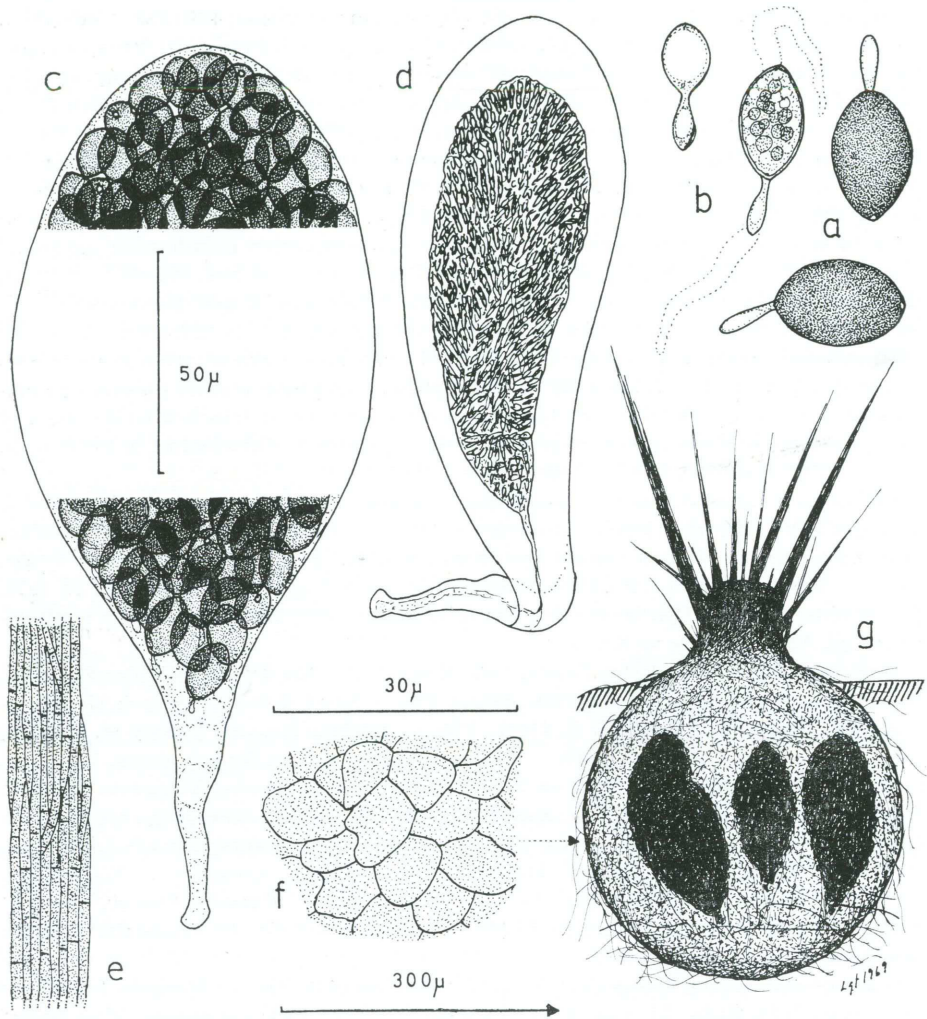


Fig. 35. *Podospora curvicolla*. *a, b, d*: J 1664-q (UPS). *c, e-g*: K. & L. Holm 19.viii.1968 (UPS). Drawn from specimens in lactophenol. *a*: Mature spores. *b*: Immature, hyaline spores at two stages of development. *c*: Mature ascus and spores. *d*: Immature ascus with spores at rod-like stage. *e*: Part of hair fascicle from perithecium. *f*: Peridium in horizontal view. *g*: Perithecium.

ILLUSTRATIONS: compare Saccardo & Traverso 1911. — Chenantais 1919, pl. 3: 6-7 as *P. setosa*. — Stratton 1921, pl. 13: 5-12. — Cain 1934, fig. 39. — Page 1939, figs. 6*c-d*, pl. 7: 8. — C. Moreau 1953, 25*a, d, e*, 26*c*, 34*f, g*, 37*b*, 39*a*, 53*g*, 60*d*. — Ingold 1956, figs. 1, 2. — Jülich 1968, fig. 6. — Fakirova 1969, fig. 7. — Mirza & Cain 1970, fig. 16.

P. curvicolla is apparently mostly associated with leporids in Europe and North America. Unverified records on other substrates must be taken with some caution,

particularly after 1953, when C. Moreau gave currency to his broad concept of the species. He included no less than four polyspored *Podosporae* in *P. curvicolla*, namely *P. eminens* (Cain) Cain, *P. longicollis* (Ames) Mirza & Cain, *P. millespora* (A. Schm.) Cain, and *P. platensis* (Speg.) Niessl. Mirza & Cain (1970: 2013) did not accept this taxonomy, nor do I. It remains to clear up the degree of polyspory in *P. curvicolla*, but, as far as I have experienced, 256 seems to be the "normal" theoretical number. Winter (1871: 161) stated the number to be 128, which may be an underestimation. His drawing on pl. 10: 19 (1873*d*) shows a saccate ascus with 123 *visible* spores in one plane, which means that the real number should be higher.

The characteristics of *P. curvicolla* are the long, pointed hair tufts, saccate asci without apical ring, small spores, and fugacious caudae. The latter are visible in immature spores only. Griffiths (1901: 88) observed long paraphyses in the species, but I cannot confirm the existence of such. Hodgkiss & Harvey (1970, 1971) have investigated its spore discharge and some physiological aspects; see also Page 1952.

Batista & Pontual (1948: 41, figs. 24, 26) described as new a *Philocopra coprophila* on rabbit dung from Brazil that might belong here. Their poor photos and incomplete description leave an incomplete guidance to an identification of the fungus. I have not seen the type collection, but several features remind roughly of *P. curvicolla*. Since they did not observe the pedicel ("desprovidos de cauda"), and called the young spores 'vermiform', *Ph. coprophila* must be held a nomen dubium for the present.

18. *Podospora granulostrata* Lundq. n. sp. (Fig. 36, pls. 29 e, f, 30)

Perithecia late obpyriformia, 960–1150 × 670–960 μ , deorsum pilis flexuosis, brunneis oblecta, sursum pilis rigidis, obtusis, brunneis, distaliter hyalinis, septatis, 25–130 × 5–6 μ instructa. *Peridium* membranaceum, semipellucidum, olivaceo-brunneum, tristratum, in collo nigrum opacum; cellulae externae peridii angulatae, 4–12 μ diam., basin colli versus inflatae, paliformes. *Paraphyses* carentes. *Asci* c. 512-spori, 480–600 × 105–170 μ , late clavati, apice rotundato, 15–18 μ lato, sine annulo apicali; membrana apicalis incrassata, 11–13 μ diam. *Sporae* multiseriatae, maturitate bicellulares; cellula superior fusco-brunnea, (18–)20–26 × 12–16 μ , aequilateralis, ellipsoidea, basi truncata, apice conico, poro germinali subapicali instructa; pedicellus 12–17 × 5–7 μ , hyalinus, obclavatus, demum collabens. *Cauda gelatinosa* apicalis 30–60 × 5–7 × 3–3.5 μ , applanata, attenuata, saltem duobus filis interdum separatis composita; cauda basalis partem inferiorem pedicelli tegens, 30–60 × 8–11 μ , aliquot filis plerumque agglutinatis composita; omnes caudae granulatae, fibrillatae, segmentatae, persistentes. — Fimicola.

Perithecia scattered or gregarious, semi-immersed to superficial, non-stromatic, broadly obpyriform, 960–1150 × 670–960 μ , ostiolate, with a cylindrical neck, 160–330 × 145–240 μ , covered below with flexuous, brown, septate, c. 2.5 μ thick hairs, and on the neck with rigid, cylindrical or tapering, obtuse, brown, hyaline-tipped, septate, non-agglutinated hairs, 25–130 × 5–6 μ , which often have irregularly placed constrictions.