Revision of the genera *Sporormia* and *Sporormiella*[1]

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Received June 16, 1971

AHMED, S. I., and R. F. CAIN. 1972. Revision of the genera *Sporormia* and *Sporormiella*. Can. J. Bot. 50: 419–477.

The genus *Sporormia* is restricted to the type species *S. fimetaria* DeNot., *S. fimicola* Ahmed & Asah and *S. mirabilis* Bret. & Faur., in which the ascospores are arranged in a truncate bundle, parallel to the ascus and surrounded by a common gelatinous sheath. The cells of the ascospores are without germ slits.

In *Sporormiella*, which is regarded as a distinct genus, the ascospores are not arranged in a truncate bundle. Each spore has a distinct and separate gelatinous sheath and each cell of the ascospore has an elongated germ slit. The type species is *S. nigropurpurea* Ell. & Ev.

The following 35 species of *Sporormia* are transferred to *Sporormiella*: *S. affinis* Sacc., *S. americana* Griff., *S. antarctica* Speg., *S. australis* Speg., *S. bipartis* Cain, *S. capybarae* Speg., *S. chaetomioides* Griff., *S. commutata* Niessl, *S. corynespora* Niessl, *S. dakotensis* Griff., *S. heptamera* Auersw., *S. herculea* Ell. & Ev., *S. insignis* Niessl, *S. irregularis* I. Egel., *S. kansensis* Griff., *S. lageniformis* Fuckel, *S. lata* Griff., *S. leporina* Niessl, *S. longispora* Cain, *S. megalospora* Auersw., *S. minima* Auersw., *S. muskokensis* Cain, *S. ontariensis* Cain, *S. ovina* (Desm.) Sacc., *S pascua* Niessl, *S. pentamera* Oud., *S. pilosa* Cain, *S. pilosella* Cain, *S. polymera* Cain, *S. pulchella* Hansen, *S. pyriformis* Speg., *S. scandinavica* I. Egel., *S. schoterriana* Bret. & Faur., *S. splendens* Cain, *S. vexans* Auersw.

There are 22 new species described in the genus *Sporormiella*, as follows: ***S. alloimera***, ***S. anisomera***, ***S. calomera***, ***S. cylindrospora***, ***S. cymatomera***, ***S. decamera***, ***S. dodecamera***, ***S. dubia***, ***S. euryspora***, ***S. isomera***, ***S. longisporopsis***, ***S. minimoides***, ***S. minipascua***, ***S. octonalis***, ***S. platymera***, ***S. schadospora***, ***S. septenaria***, ***S. systenospora***, ***S. subtilis***, ***S. teretispora***, ***S. tetramera***, ***S. trogospora***.

These coprophilous species are from Argentina, Canada, Mexico, and the United States.

A total of 66 species are described, 61 of which are illustrated. Keys to the species of *Sporormia* and *Sporormiella* are included.

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Le genre *Sporormia* est limité à l'espèce type *S. fimetaria* DeNot., *S. fimicola* Ahmed & Asah et à *S. mirabilis* Bret. & Faur., où les ascospores sont disposées en un faisceau tronqué, parallèle à l'asque, et entourées par une enveloppe gélatineuse commune. Les cellules des ascospores n'ont pas de fentes germinatives.

Chez *Sporormiella*, considéré comme un genre différent, les ascospores ne sont pas disposées en un faisceau tronqué. Chaque spore a une enveloppe gélatineuse distincte et séparée, et chaque cellule de l'ascospore a une fente germinative allongée. L'espèce type est *S. nigropurpurea* Ell. & Ev.

Les 35 espèces suivantes de *Sporormia* sont transférées au genre *Sporormiella*: *S. affinis* Sacc., *S. americana* Griff., *S. antarctica* Speg., *S. australis* Speg., *S. bipartis* Cain, *S. capybarae* Speg., *S. chaetomioides* Griff., *S. commutata* Niessl, *S. corynespora* Niessl, *S. dakotensis* Griff., *S. heptamera* Auersw., *S. herculea* Ell. & Ev., *S. insignis* Niessl, *S. irregularis* I. Egel., *S. kansensis* Griff., *S. lageniformis* Fuckel, *S. lata* Griff., *S. leporina* Niessl, *S. longispora* Cain, *S. megalospora* Auersw., *S. minima* Auersw., *S. muskokensis* Cain, *S. ontariensis* Cain, *S. ovina* (Desm.) Sacc., *S. pascua* Niessl, *S. pentamera* Oud., *S. pilosa* Cain, *S. pilosella* Cain, *S. polymera* Cain, *S. pulchella* Hansen, *S. pyriformis* Speg., *S. scandinavica* I. Egel., *S. schoterriana* Bret. & Faur., *S. splendens* Cain, *S. vexans* Auersw.

Vingt-deux nouvelles espèces de *Sporormiella* sont décrites: ***S. alloimera***, ***S. anisomera***, ***S. calomera***, ***S. cylindrospora***, ***S. cymatomera***, ***S. decamera***, ***S. dodecamera***, ***S. dubia***, ***S. euryspora***, ***S. isomera***, ***S. longisporopsis***, ***S. minimoides***, ***S. minipascua***, ***S. octonalis***, ***S. platymera***, ***S. schadospora***, ***S. septenaria***, ***S. systenospora***, ***S. subtilis***, ***S. teretispora***, ***S. tetramera***, ***S. trogospora***.

Ces espèces coprophiles viennent d'Argentine, du Canada, du Mexique et des États-Unis.

Un total de 66 espèces sont décrites, dont 61 sont illustrées. Des clés d'identification sont présentées pour les espèces de *Sporormia* et *Sporormiella*.

Introduction

The genus *Sporormia* was established by DeNotaris (1849) with a single species, *S. fimetaria*, which consequently becomes the type. The same species was used as the type of the genus *Brochospora* by Kirschstein (1944). He evidently accepted the proposal of Clements and Shear (1931) to make *S. minima* Auerswald the type of the genus *Sporormia*. This is not pos-

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[1]Taken from a thesis for the degree of Doctor of Philosophy at the University of Toronto. The study was financially supported by grants from the National Research Council of Canada to the junior author.

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sible and *Brochospora* is consequently a synonym of *Sporormia*. *Sporormiella* was published by Ellis and Everhart (1892) with a single new species, *S. nigropurpurea* with four-celled ascospores. This genus was separated from *Sporormia* on the basis of a reported stroma on the surface of the dung. We failed to find any fungus stroma on the dung in the type collection. The surface of the dung is blackened, but this is not fungus stroma. *S. nigropurpurea* is consequently not generically distinct from the species with four-celled ascospores that have been placed in *Sporormia*.

Breton and Faurel accepted Kirschstein's (1944) proposal of separating *Sporormia* into two genera and erected a new genus *Sporormiopsis* with the type species *Sporormia minima* Auerswald (given as *Sporormiopsis minima* Auerswald). They suggested that the genus *Sporormia* be restricted to *S. fimetaria* and *S. mirabilis* Breton & Faurel.

Ahmed and Asad (1968) also restricted the genus to the two species named above with an additional new one, *Sporormia fimicola*.

In this publication, *Sporormia* is used in this restricted sense for these three species. The remaining species are treated under the oldest, validly published generic name for this large group of species, *Sporormiella*, or otherwise excluded from *Sporormia*. We include keys for 66 species. Of these, 37 are new combinations and 22 are described as new. Illustrations are given for all except five. No attempt has been made to deal with the non-coprophilous species, which are merely listed. We have included an additional list of coprophilous species for which we have had no material for examination.

Methods

Measurements of asci and ascospores were taken in water. The length of the asci included the ascospore-containing portion of the stipe (length of the stipe consists of non-ascospore-bearing part). To determine the width of the asci and ascospores, measurements were taken at the broadest part. Measurements of the ascospores do not include the gelatinous sheath.

Aqueous cotton blue was used for staining the hyaline gelatinous sheaths, which were difficult to observe in water mounts. Semipermanent slides were made by staining with cotton blue in lactophenol and sealing them with nail polish. After the nail polish was completely dried, a layer of picture varnish was applied.

The terminology used for germ slits was based on the examination of the ascospores in surface view. When the germ slit was parallel to the longitudinal axis of the ascospores it was called parallel and when oblique to this axis, it was designated as oblique. In cases where the ends of a germ slit met the diagonally opposite ends of the ascospore cell it was described as diagonal. In species where the germ slit was at right angles to the longitudinal axis of the ascospore it was termed transverse.

Descriptions

SPORORMIA

Sporormia DeNot., Mem. Accad. Torino 2, 10: 342. 1849.
= *Brochospora* Kirsch., Hedwigia, 81: 204. 1944.

Fimicolous. Perithecia scattered, subglobose, immersed in the substrate, neck absent; peridium thin, membranaceous. Asci eight-spored, bitunicate, cylindrical, broadly rounded above, contracted below into a short stipe. Ascospores cylindrical, 15- or more-septate, finally becoming dark brown, united by a common gelatinous sheath into a cylindrical, truncate mass in the center of the ascus; septa transverse; germ slits usually absent.

TYPE SPECIES: *Sporormia fimetaria* De Not.

KEY TO THE SPECIES OF *Sporormia*

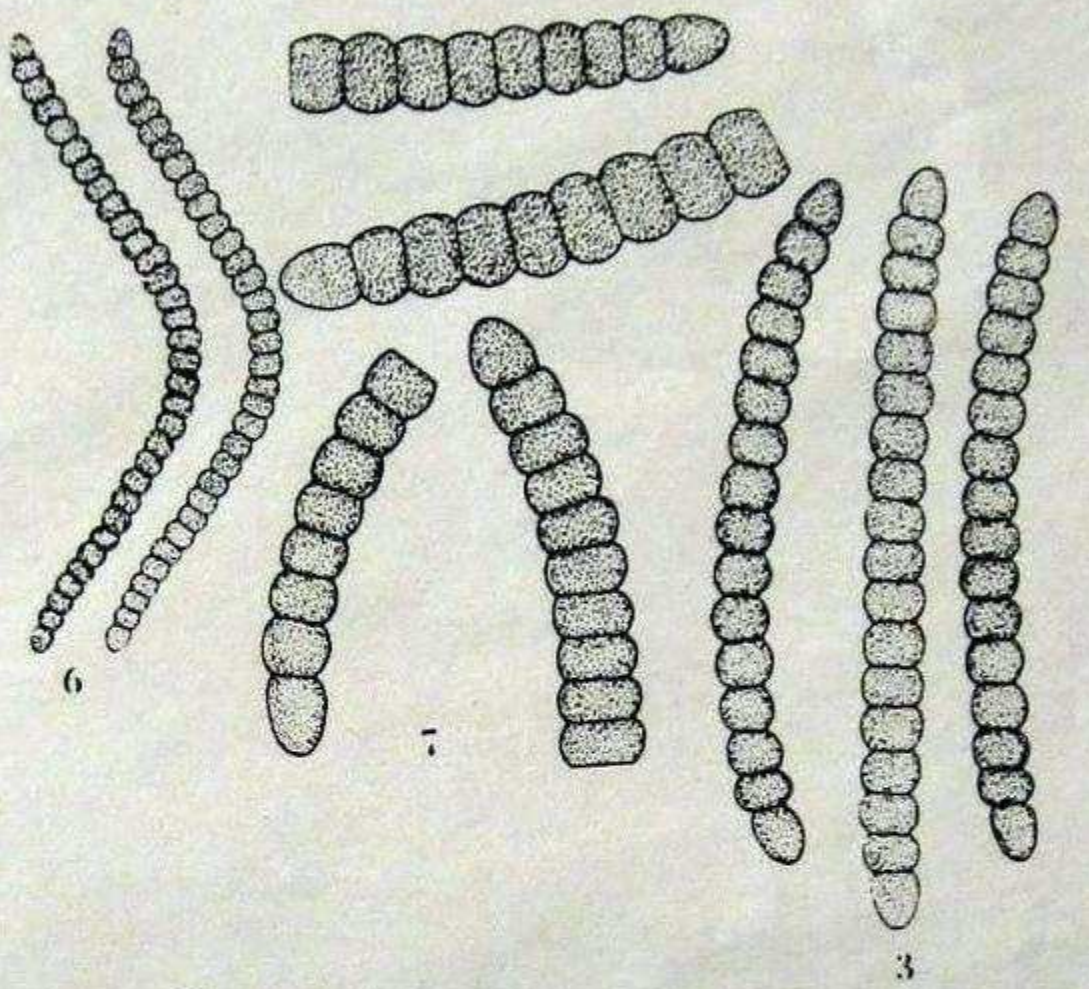
1. Perithecia less than 150 μ in diameter; asci less than 100 μ long, ascospores 16- to 20-celled, 50–57 × 3.5–4.5 μ (Figs. 1–3) ..... 1. *S. fimetaria*
1. Perithecia more than 150 μ in diameter; asci over 100 μ long; ascospores 29- to 32-celled, 130–160 × 4–6 μ (Figs. 4–7) ..... 2. *S. mirabilis*
1. Perithecia more than 150 μ in diameter; asci over 100 μ long; ascospores 16-celled, 85–116 × 5.0–6.5 μ ..... 3. *S. fimicola*

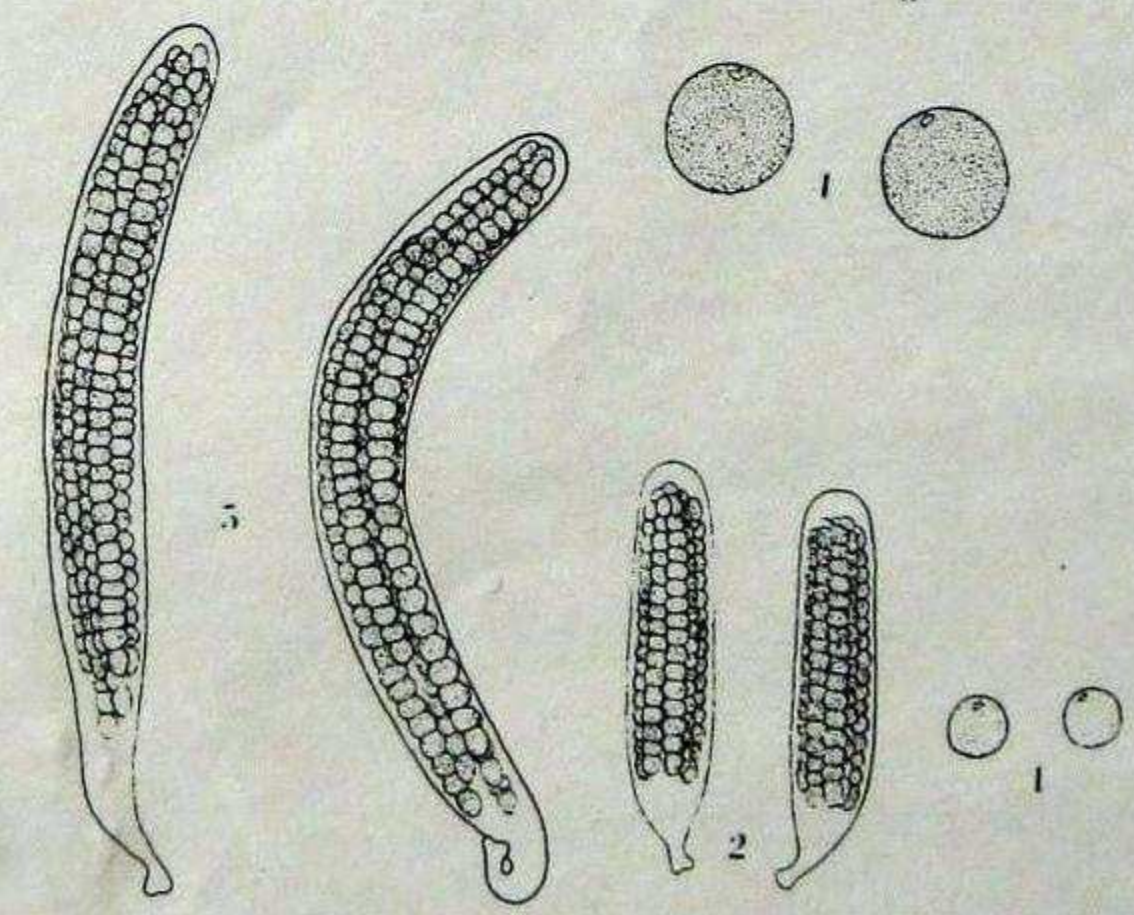
1. *Sporormia fimetaria* De Not., Mem. Accad. Torino, 2, 10: 342. 1849. Figs. 1–3
≡ *Sphaeria fimetaria* (De Not.) Rabenh., Herb. Mycol. (ed. 1), No. 1733. 1853.
≡ *Brochospora fimetaria* (De Not.) Kirsch., Hedwigia, 81: 204. 1944.

Perithecia scattered, immersed in the substrate, globose, 91–125 μ in diameter, thin, membranaceous, dark brown and opaque, without neck, the ostiole being simply an opening in the perithecial wall. Asci eight-spored, cylindrical, 70–80 × 12–16 μ, broadly rounded

above, contracted below into a very short persistent stipe. Paraphyses filiform, septate, sparingly branched, longer than and mixed with the asci. Ascospores parallel, firmly united into a cylindrical, truncate mass in the center of the ascus, 16- to 20-celled, cylindrical, 50–57 × 3.5–4.5 μ, broadly rounded at the ends, light brown when young, becoming dark brown and opaque when mature, transversely septate; constrictions at septa broad and deep; segments easily separable; terminal cells nearly twice the length of the remaining cells; germ slit absent; a narrow hyaline gelatinous sheath surrounds the entire mass of ascospores.

HABITAT: On dung of cow, deer, goat, and rabbit.





FIGS. 1–3. *Sporormia fimetaria* (TRTC 38898). Fig. 1. Perithecia, × 40. Fig. 2. Asci with ascospores, × 430. Fig. 3. Ascospores, × 920. FIGS. 4–7. *Sporormia mirabilis* (TRTC 38880). Fig. 4. Perithecia, × 40. Fig. 5. Asci with ascospores, × 430. Fig. 6. Ascospores, × 430. Fig. 7. Parts of the ascospores, × 920.

TYPE: Italy.

SPECIMENS EXAMINED: CANADA: British Columbia: TRTC 39741. MEXICO: Nuevo Leon, TRTC 38898. UNITED STATES: Kansas: Rooks Co., TRTC 39373. Montana: Prairie Co., TRTC 35753. New York: Cattaraugus Co., TRTC 37606. Ohio: Peebles Co., *Bruce Fink*.

2. *Sporormia mirabilis* Bret. & Faur. Bull. Tri. Soc. Mycol. Fr. 80: 247–258. 1964.

Figs. 4–7

Perithecia scattered, immersed, subglobose, 180–300 μ in diameter, membranaceous, smooth, bare, dark brown to black; neck absent, ostiole being simply an opening in the wall of the peridium. Asci eight-spored, cylindrical, 150–200 × 17–21 μ, broadly rounded above, contracted below into a small, stout, rather persistent stipe, 10–15 μ in length. Paraphyses filiform, septate, sparingly branched, slightly longer, and mixed with the asci, 1.5–2.0 μ in diameter. Ascospores parallel to the ascus, grouped into a cylindrical mass occupying the major portion of the ascus, usually 32-celled, occasionally 29- to 31-celled, cylindrical, 130–160 × 4–6 μ, rounded at the ends, light brown when young, becoming dark brown and opaque when mature, transversely septate; constrictions at septa broad and deep, segments easily separable; terminal cells slightly narrower toward the ends, longer than the remaining cells; germ slit absent; gelatinous sheath hyaline, thin, enveloping the ascospore bundle.

HABITAT: On dung of wild sheep and goat.

TYPE: On dung of wild sheep, Issakarassène, Hoggar, Algeria, *P. Bourreil* and *P. Quezel*.

SPECIMENS EXAMINED: MEXICO: Durango, on goat dung, 13 Aug. 1960, *Cain*, TRTC 38880.

3. *Sporormia fimicola* Ahmed & Asad, Sydowia, 21: 291. 1967.

Perithecia subglobose, glabrous, 250–400 μ diameter, without neck. Asci eight-spored, cylindrical, 130–160 × 16–19 μ, abruptly contracted into a short stipe. Ascospores in a cylindrical bundle parallel with the ascus, 16-celled (very rarely 17-celled), cylindrical, 85–116 × 5.0–6.5 μ, with cells (excepting terminal ones) equal and easily separable. Apical cell reaching 6 μ long. Basal cell reaching 7 μ long. Germ slit oblique to diagonal. Ascospore bundle surrounded by a thin gelatinous sheath.

HABITAT: On goat dung.

TYPE: On goat dung, Karachi, W. Pakistan.

SPORORMIELLA

Sporormiella Ell. & Ev., North American Pyrenomycetes. p. 136. 1892.

= *Sporormiopsis* Bret. & Faur., Bull. Trim. Soc. Mycol. Fr. 80: 257. 1964. TYPE SPECIES: *Sporormia minima* Auersw.

= *Ohleriella* Earle, N.Y. Bot. Gard. J. 3: 349. 1902.

Petrak (1951) stated that *Ohleriella* is the same as *Sporormia*. From his description of the type species *O. mexicana* Earle, this is probably a synonym of *Sporormiella octomera*.

Fimicolous. Perithecia immersed to semi-immersed, scattered or aggregated in small groups, membranaceous to coriaceous, dark brown to black, smooth or covered with hairs in the upper part; neck varying from short papilliform to long cylindrical. Asci eight-spored, bitunicate, cylindrical to clavate with short to relatively long stipe. Ascospores three- to many-septate, at first hyaline, finally becoming dark brown; septa transverse to oblique; germ slit elongated, extending the entire length of the cell, parallel to diagonal, or transverse to the longitudinal axis of the ascospore; gelatinous sheath hyaline, surrounding each ascospore.

TYPE SPECIES: *Sporormiella nigropurpurea* Ell. & Ev.

KEY TO THE SPECIES OF *Sporormiella*

1. Ascospores four-celled 2
1. Ascospores more than four-celled 34

2. Ascospores uniseriate 3
2. Ascospores in two or more series 4

3. Ascospores less than 30 μ long (Figs. 8–10) ..... 51. *S. pulchella*
3. Ascospores over 30 μ long (Figs. 11–13) ..... 31. *S. lata*

4. Perithecia and neck hairy 5
4. Perithecia and neck not hairy 7

5. Ascospores over 50 μ long (Figs. 14–17)..... 47. *S. pilosa*
5. Ascospores less than 50 μ long..... 6

6. Ascospores over 7 μ wide, terminal cells longer and narrower than the mid-cells, germ slit diagonal (Figs. 18–20)..... 48. *S. pilosella*
6. Ascospores less than 7 μ wide, cells nearly equal in size, germ slit parallel (Figs. 21–23)..... 11. *S. chaetomioides*

7. Asci cylindrical, abruptly contracted below into a short stipe..... 8
7. Asci tapering gradually from the broadest part near the apex into a short or elongated stipe..... 13

8. Ascospores less than 37 μ long..... 9
8. Ascospores over 37 μ long..... 10

9. Germ slit nearly parallel, with a kink near the middle; cells readily separable at the central septum, easily separable at the other septa (Figs. 24–26)..... 36. *S. minima*
9. Germ slit very strongly oblique to diagonal, without a kink near the middle; cells equally separable at all septa (Figs. 27–29)..... 37. *S. minimoides*

10. Ascospores less than 47 μ long (Figs. 30–32)..... 6. *S. australis*
10. Ascospores over 47 μ long..... 11

11. Ascospores less than 60 μ long (Figs. 33, 34)..... 26. *S. intermedia*
11. Ascospores over 60 μ long..... 12

12. Ascospores 60–65 × 10.5–12.5 μ (Figs. 35, 36)..... 60. *S. teretispora*
12. Ascospores 70–80 × 13–16 μ (Figs. 37–40)..... 14. *S. cylindrospora*
12. Ascospores 92–114 × 18–21 μ..... 8. *S. borealis*

13. Septa of the ascospores oblique..... 14
13. Septa of the ascospores transverse..... 15

14. Ascospores 27–32 × 5.5–6.0 μ (Figs. 41–43)..... 39. *S. muskokensis*
14. Ascospores 37–42 × 7.5–8.5 μ (Figs. 44–46)..... 30. *S. lageniformis*
14. Ascospores 50–58 × 10–13.5 μ..... 27. *S. irregularis*

15. Ascospores less than 60 μ long..... 16
15. Ascospores over 60 μ long..... 27

16. Ascospores cylindrical or subcylindrical..... 17
16. Ascospores somewhat tapered toward each end..... 21

17. Ascospores less than 30 μ long..... 18
17. Ascospores over 30 μ long..... 20

18. Ascospores less than 4.5 μ wide; germ slit parallel (Figs. 47–49)..... 16. *S. dakotensis*
18. Ascospores over 4.5 μ wide; germ slit oblique to diagonal or diagonal..... 19

19. Ascospores over 23 μ long; germ slit oblique to diagonal (Figs. 50–52)..... 59. *S. subtilis*
19. Ascospores less than 23 μ long; germ slit diagonal (Figs. 53–55)..... 40. *S. nigropurpurea*

20. Upper cell of the ascospore conspicuously narrowed toward the end; cells of the ascospore not easily separable, germ slit oblique to diagonal, occasionally parallel, septa transverse with a tendency toward being oblique (Figs. 56, 57)..... 32. *S. leporina*
20. Upper cell of the ascospore not conspicuously narrowed toward the end; cells of the ascospore easily separable, germ slit usually parallel, occasionally oblique, with a kink near the middle, septa strictly transverse (Figs. 58–60)..... 28. *S. isomera*

21. All cells of the ascospore nearly equal in size, germ slit usually parallel in all the cells..... 22
21. All cells of the ascospore not equal in size, germ slit not parallel in all the cells..... 23

22. Septa of ascospores usually transverse, occasionally tend to be oblique; ascospores 45–52 × 11.5–14 μ (Figs. 61, 63)..... 21. *S. grandispora*
22. Septa of the ascospores strictly transverse; ascospores 38–45 × 8–9 μ (Figs. 64–66)..... 19. *S. dubia*

23. Terminal cells longer than mid-cells and nearly equal in size; mid-cells nearly equal in size..... 24
23. All cells of the ascospore unequal in size..... 25

24. Ascospores 27–34 × 7–10 μ, diagonal germ slit in all the cells (Figs. 67–69)..... 15. *S. cymatomera*
24. Ascospores 38–43 × 12–15 μ, parallel to slightly oblique germ slit in the terminal cells, transverse to obliquely transverse in the mid-cells (Figs. 70–72)..... 4. *S. anisomera*

25. Ascospores over 45 μ long (Figs. 73, 74)..... 10. *S. capybarae*
25. Ascospores less than 45 μ long..... 26

26. Ascospores 20–30 × 5.5–7.0 μ..... 24. *S. inaequalis*
26. Ascospores 32–38 × 6–8 μ (Figs. 75–77)..... 61. *S. tetramera*
26. Ascospores 38–44 × 10–13 μ (Figs. 78–80)..... 2. *S. alloiomera*

27. Ascospores less than 80 μ long..... 28
27. Ascospores over 80 μ long..... 31

28. Ascospores conspicuously narrowed toward ends, germ slit parallel except in second cell..... 53. *S. scandinavica*
28. Ascospores conspicuously narrowed toward ends, germ slit oblique or obliquely transverse..... 29
28. Ascospores usually not conspicuously narrowed toward ends, germ slit strictly parallel or diagonal..... 30

29. Ascospores less than 15 μ wide, germ slit oblique (Figs. 81–84)..... 58. *S. systenospora*
29. Ascospores over 15 μ wide, germ slit obliquely transverse (Figs. 85, 86)..... 52. *S. pyriformis*

30. Ascospores less than 13 μ wide, germ slit strictly parallel (Figs. 87–89)..... 29. *S. kansensis*
30. Ascospores over 13 μ wide, germ slit diagonal (Figs. 90–93)..... 35. *S. megalospora*

31. Ascospores over 17 μ wide..... 32
31. Ascospores less than 17 μ wide..... 33

32. Ascospores 80–88 × 20–24 μ, germ slit transverse to obliquely transverse (Figs. 94–97)..... 20. *S. euryspora*
32. Ascospores 95–118 × 18–20 μ, germ slit nearly parallel to almost diagonal (Figs. 98–101)..... 44. *S. ovina*

33. Ascospores less than 14 μ wide, four ascospores at about the same level in the upper part of the ascus and the other four ascospores at different levels below; septa occasionally almost oblique (Figs. 102–105)..... 33. *S. longispora*
33. Ascospores over 14 μ wide, two- or three-seriate; septa strictly transverse (Figs. 106–109)..... 34. *S. longisporopsis*

>4-celled
34. Number of cells in the ascospores constant..... 35
34. Number of cells in the ascospores variable..... 56

35. Ascospores five-celled (Figs. 110, 111)..... 46. *S. pentamera*
35. Ascospores more than five-celled..... 36

36. Ascospores seven-celled..... 37
36. Ascospores more than seven-celled..... 41

37. Ascospores over 68 μ long (Figs. 112–114)..... 22. *S. heptamera*
37. Ascospores less than 68 μ long..... 38

38. Ascospores less than 10 μ broad..... 39
38. Ascospores more than 10 μ broad..... 40

39. Five middle cells of the ascospore broader than long, more or less rhomboidal in shape, septa transverse to slightly oblique (Figs. 115, 116)..... 63. *S. vexans*
39. Second to fourth cell of the ascospore from the upper end broader than long, cells not rhomboidal in shape, septa strictly transverse (Figs. 117–119)..... 56. *S. septenaria*

40. Ascospores less than 14 μ wide, terminal cells ovate, germ slit oblique to diagonal (Figs. 120–123)..... 3. *S. americana*
40. Ascospores over 14 μ wide, terminal cells hemispherical, germ slit transverse to obliquely transverse (Figs. 124–126)..... 62. *S. trogospora*

41. Ascospores eight-celled..... 42
41. Ascospores more than eight-celled..... 53

42. Ascospores more or less clavate, one cell of the ascospores enlarged..... 43
42. Ascospores cylindrical, no cell of the ascospore enlarged..... 50

43. Third cell from the upper end enlarged....44
43. Fourth cell from the upper end enlarged....48

44. Ascospores over 60 μ long (Figs. 127, 128)....1. *S. affinis*
44. Ascospores less than 60 μ long....45

45. Ascospores over 10 μ wide....46
45. Ascospores less than 10 μ wide....47

46. Asci clavate, gradually narrowing below into a long stipe, spore slightly clavate, apical cell conical, ascospores less than 12 μ wide (Figs. 129, 130)....13. *S. corynespora*
46. Asci cylindrical-clavate, abruptly contracted below into a very short stipe; ascospores oblong-fusiform, apical cells hemispherical, ascospores over 12 μ wide (Figs. 131–133)....42. *S. octonalis*

47. Ascospores less than 50 μ long (Figs. 134, 135)....41. *S. octomera*
47. Ascospores over 50 μ long (Figs. 136–138)....54. *S. schadospora*

48. Ascospores over 49 μ long (Figs. 139–141)....43. *S. ontariensis*
48. Ascospores less than 49 μ long....49

49. Ascospores 32–36 × 5.5–6.5 μ (Figs. 142–144)....38. *S. minipascua*
49. Ascospores 40–49 × 8–9 μ (Figs. 145, 146)....45. *S. pascua*

50. Ascospores over 100 μ long....51
50. Ascospores less than 100 μ long....52

51. Ascospores 140–160 × 9.0–12.5 μ, cells longer than broad, asci bulging in the middle (Figs. 150–153)....57. *S. splendens*
51. Ascospores 100–122 × 13–15 μ, cells as long as broad, asci not bulging in the middle portion (Figs. 154–157)....25. *S. insignis*

52. Ascospores 79–95 × 14–16 μ, segments easily separable at all septa, germ slit parallel in the terminal cells, transverse to obliquely transverse in the remaining cells (Figs. 158–161)....49. *S. platymera*
52. Ascospores 48–58 × 6–7 μ, segments readily separable at the central septum, not easily separable at other septa (Figs. 147–149)....7. *S. bipartis*

53. Ascospores 10-celled (Figs. 162–164)....17. *S. decamera*
53. Ascospores more than 10-celled....54

54. Ascospores 16-celled....55. *S. schotteriana*
54. Ascospores less than 16-celled....55

55. Ascospores 12-celled (Figs. 165–167)....18. *S. dodecamera*
55. Ascospores 13-celled (Figs. 168, 169)....5. *S. antarctica*

variable

56. Ascospores 100–160 μ long, 10- to 16-celled, 1 cell (2nd to 5th) from the upper end conspicuously enlarged only in the uppermost spore of the ascus (Figs. 170–174)....23. *S. herculea*
56. Ascospores less than 100 μ long....57

57. Ascospores seven- to nine-celled, 50–60 × 8.0–10.5 μ, third cell from the upper end larger than the rest (Figs. 175–178)....12. *S. commutata*
57. Ascospores more than nine-celled....58

58. Ascospores fusiform, 10- to 13-celled, 65–80 × 17–20 μ, 2 middle cells enlarged, asci cylindrical-clavate, stipe short (Figs. 183–186)....9. *S. calomera*
58. Ascospores cylindrical, 14- to 15-celled, 63–82 × 9.5–11 μ, in 15-celled ascospores the 7th cell is larger and in 14-celled ascospores the 5th and the 6th cells are larger, asci clavate, stipe very long (Figs. 179–182)....50. *S. polymera*

Descriptions

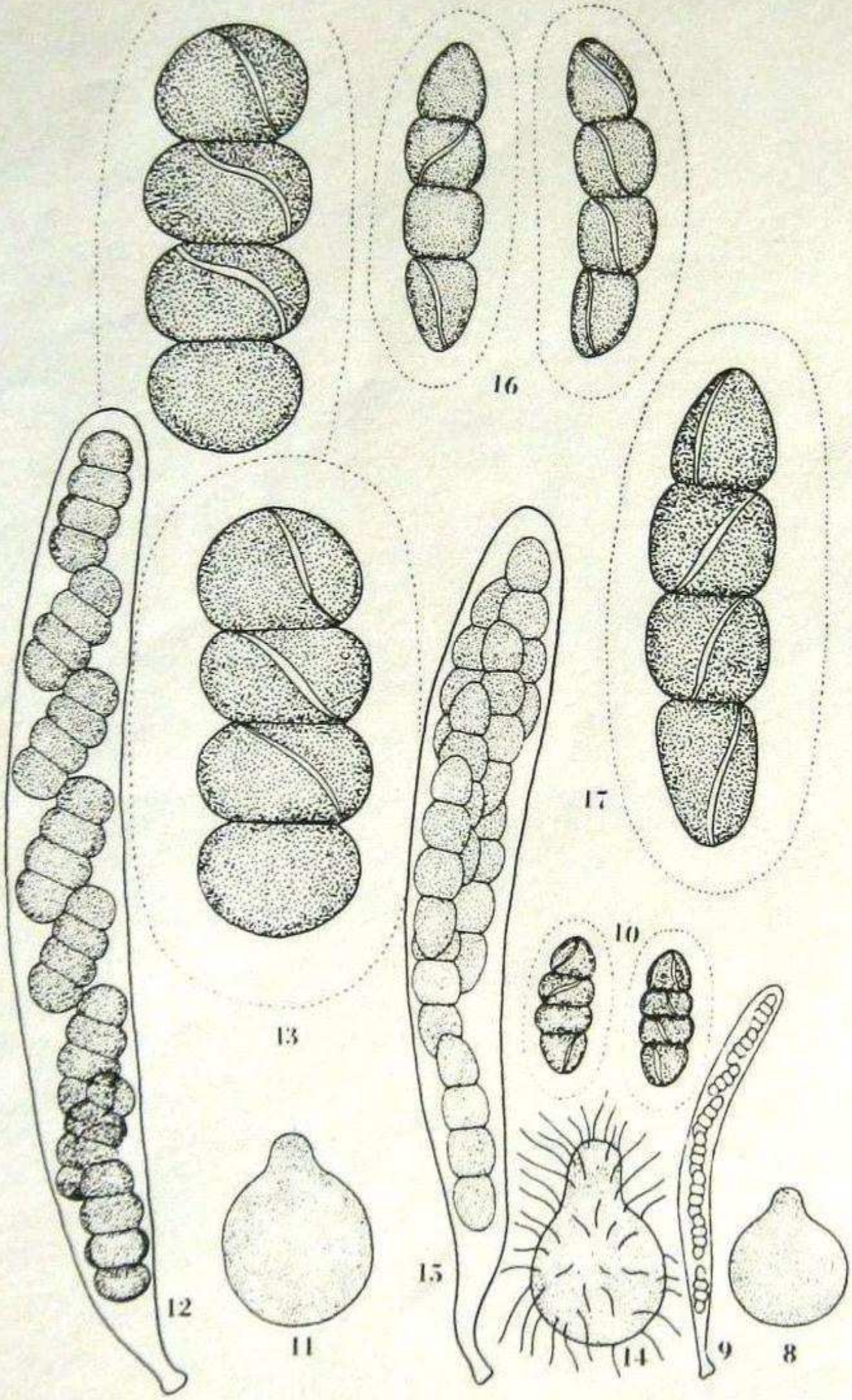
1. ***Sporormiella affinis*** (Sacc., Bomm. & Rouss.) Ahmed & Cain, comb. nov. Figs. 127, 128

BASIONYM: *Sporormia affinis* Sacc., Bomm. & Rouss., Bull. Soc. R. Bot. Belg. 25: 171. 1886.

= *Sporormia octomera* var. *macrospora* Felt., Piltz-Flora Luxemburg. 1, 2: 223. 1901.

Perithecia scattered, immersed, subglobose, 300–450 μ in diameter, smooth, bare, black; neck small, papilliform, smooth, bare, black. Peridium membranaceous. Asci eight-spored,

clavate, 210–240 × 30–36 μ, broadly rounded above, broadest near the apex, gradually narrowing below into a fairly short stipe, measuring 20–30 μ in length. Paraphyses abundant, filiform, septate, slightly constricted at the septa, equalling the asci and mixed with them. Ascospores bi- or tri-seriate above, uni- or bi-seriate below, eight-celled, fusiform-cylindrical,



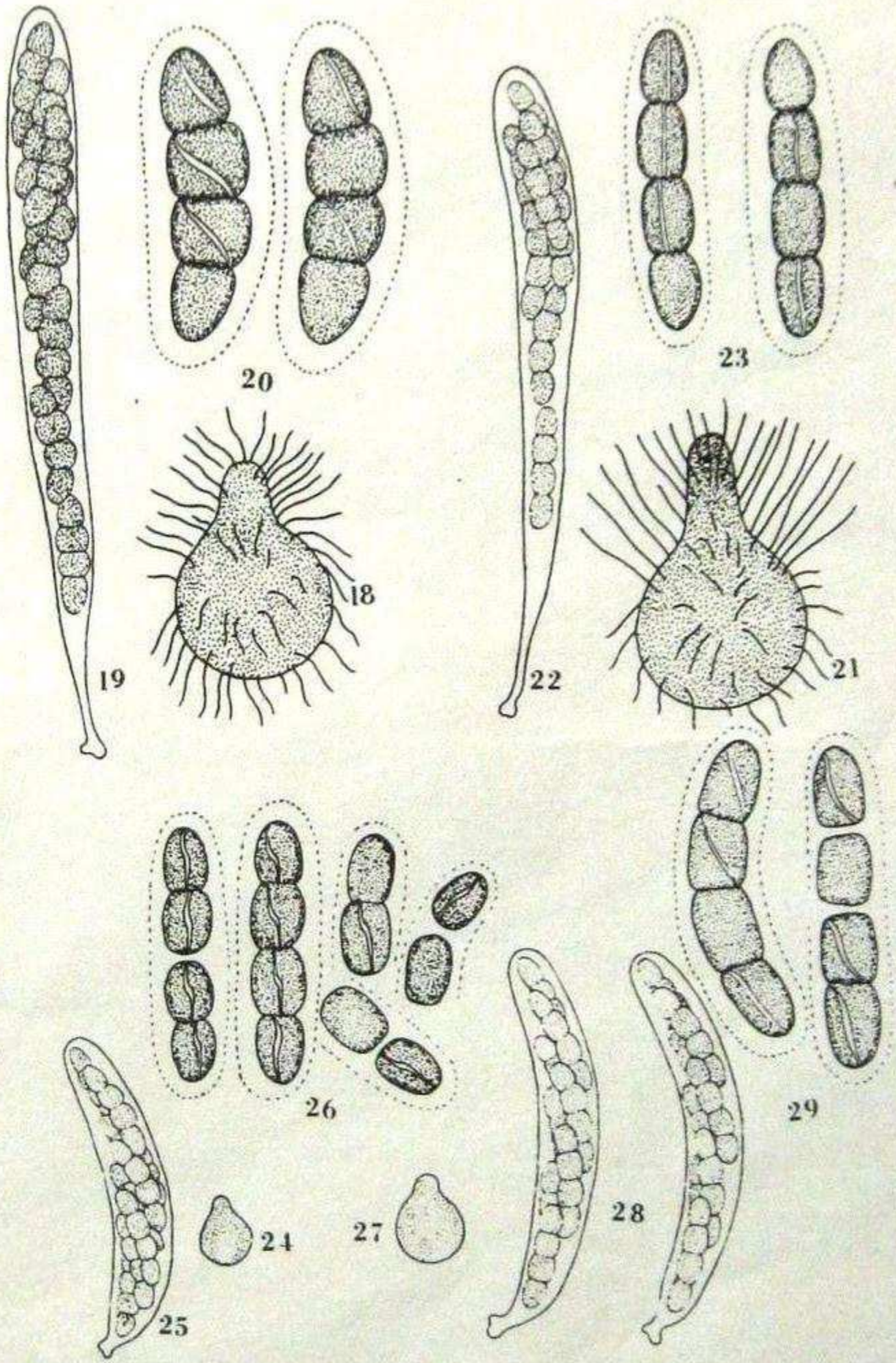
FIGS. 8–10. *Sporormiella pulchella* (TRTC 36871). Fig. 8. Perithecium, × 40. Fig. 9. Ascus with ascospores, × 430. Fig. 10. Ascospores, × 920. FIGS. 11–13. *Sporormiella lata* (TRTC 36615). Fig. 11. Perithecium, × 40. Fig. 12. Ascus with ascospores, × 430. Fig. 13. Ascospores, × 920. FIGS. 14–17. *Sporormiella pilosa* (TRTC 5315). Fig. 14. Perithecium, × 40. Fig. 15. Ascus with ascospores, × 430. Fig. 16. Ascospores, × 660. Fig. 17. Ascospore, × 920.

65–80 × 12–15 μ, rounded at the ends, dark brown and opaque when mature, septa transverse, constrictions at septa broad and deep, segments easily separable; third cell from the upper end broadest, tapering gradually toward each end, terminal cells somewhat bluntly conical, germ slit oblique to diagonal, gelatinou sheath hyaline, broad.

HABITAT: On dung of rabbit.

TYPE: Europe.

SPECIMENS EXAMINED: CANADA: Ontario: Bruc Co., TRTC 5345, RFC 5927. Simcoe Co

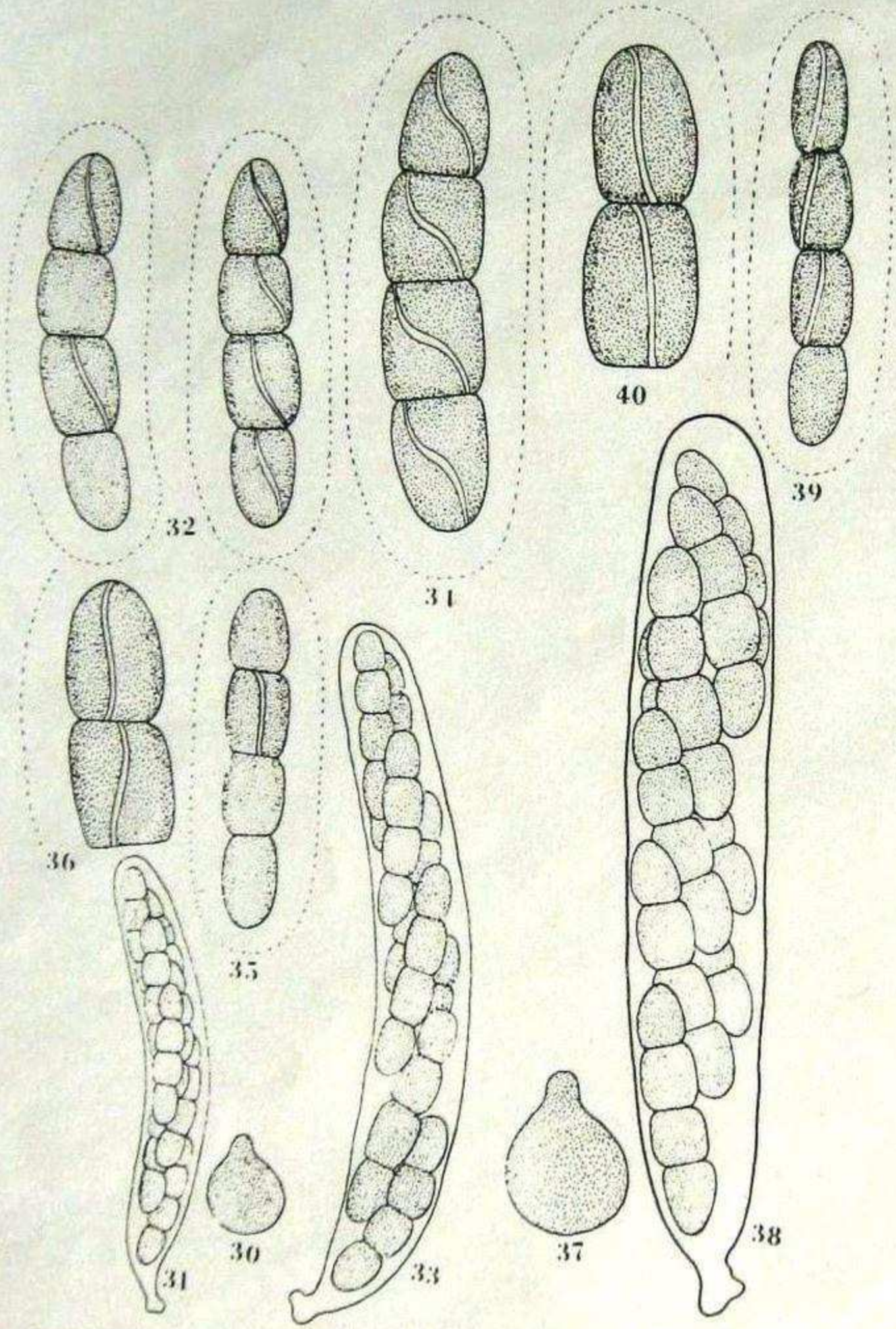


FIGS. 18–20. *Sporormiella pilosella* (TRTC 5316). Fig. 18. Perithecium, × 40. Fig. 19. Ascus with ascospores, × 430. Fig. 20. Ascospores, × 920. FIGS. 21–23. *Sporormiella chaetomioides* (TRTC 38420). Fig. 21. Perithecium, × 40. Fig. 22. Ascus with ascospores, × 430. Fig. 23. Ascospores, × 920. FIGS. 24–26. *Sporormiella minima* (TRTC 39787). Fig. 24. Perithecium, × 40. Fig. 25. Ascus with ascospores, × 430. Fig. 26. Ascospores, × 920. FIGS. 27–29. *Sporormiella minimoides* (TRTC 36242). Fig. 27. Perithecium, × 40. Fig. 28. Asci with ascospores, × 430. Fig. 29. Ascospores, × 920.

TRTC 37502. UNITED STATES: Idaho: Elmore Co., TRTC 39863. Montana: Prairie Co., TRTC 35757. Oregon: Deschutes Co., TRTC 40179. Wyoming: Teton Co., TRTC 32308. MEXICO: Durango, TRTC 37463.

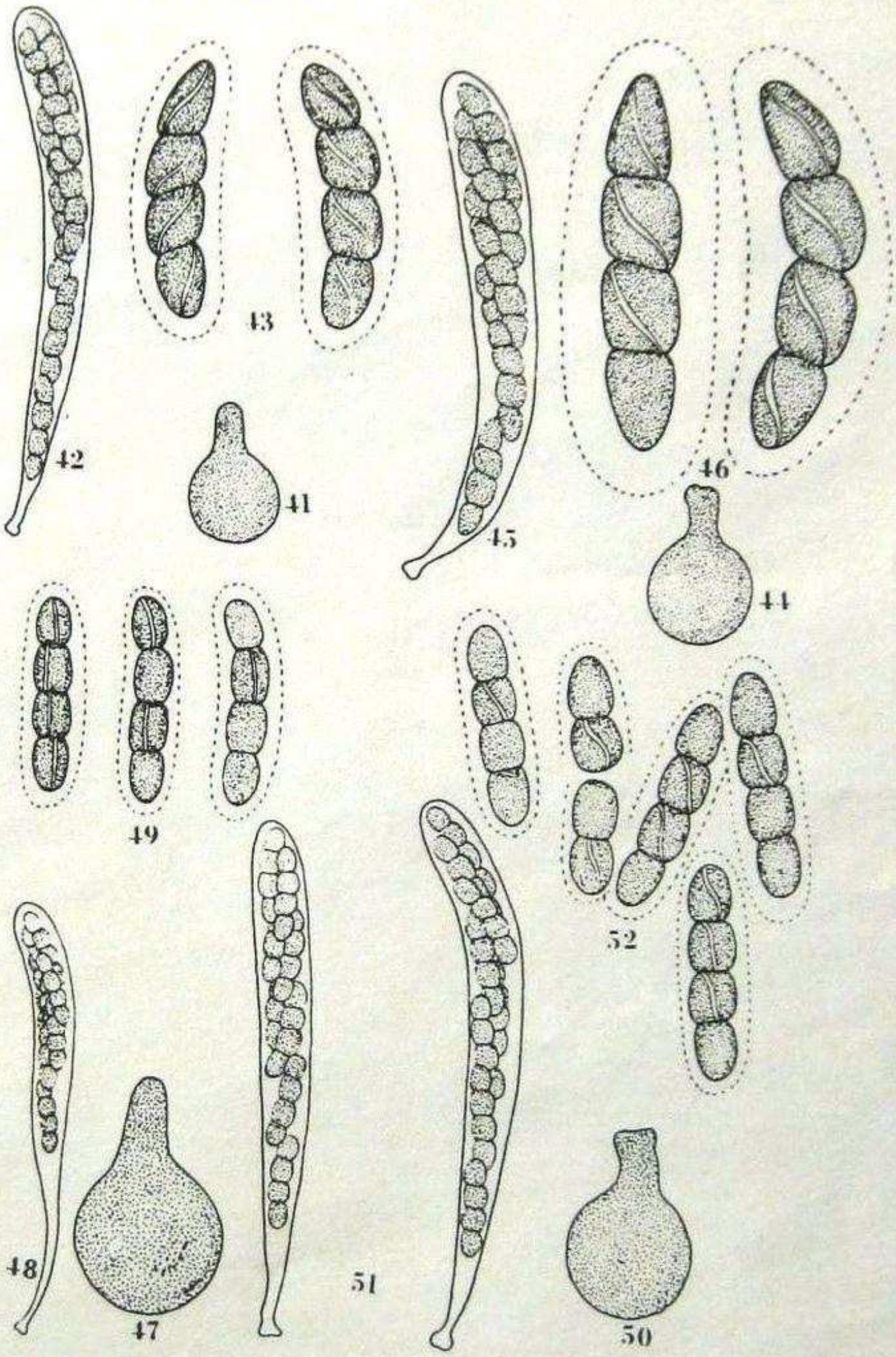
2. ***Sporormiella alloiomera*** Ahmed & Cain, sp. nov. Figs. 78–80

Peritheciis sparsis, immersis, subglobosis, 250–300 μ diam, atro-brunneis usque nigris, denudatis; collo brevi, papilliformi, nigro denudato.



FIGS. 30–32. *Sporormiella australis* (TRTC 36629). Fig. 30. Perithecium, × 40. Fig. 31. Ascus with ascospores, × 430. Fig. 32. Ascospores, × 920. FIGS. 33, 34. *Sporormiella intermedia* (TRTC 36108). Fig. 33. Ascus with ascospores, × 430. Fig. 34. Ascospore, × 920. FIGS. 35, 36. *Sporormiella teretispora* (LPS 3502). Fig. 35. Ascospore, × 660. Fig. 36. Part of ascospore, × 920. FIGS. 37–40. *Sporormiella cylindrospora* (TRTC 38977). Fig. 37. Perithecium, × 40. Fig. 38. Ascus with ascospores, × 430. Fig. 39. Ascospore, × 660. Fig. 40. Part of ascospore, × 920.

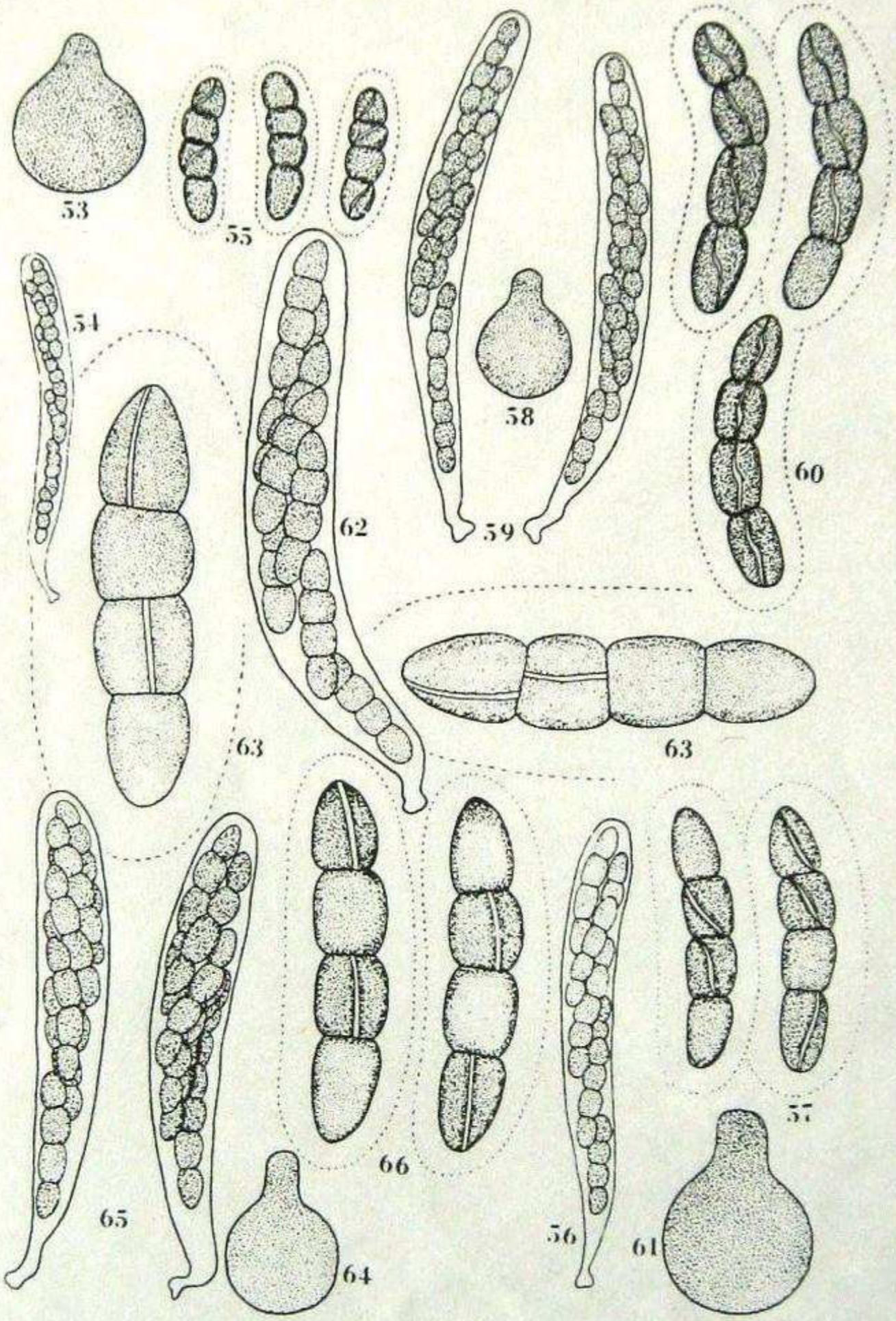
Peridio tenui membranaceo. Ascis octosporis, cylindraceo-clavatis, 130–150 × 20–23 μ, superne late rotundatis, prope mediam partem latissimis, breve stipitatis; stipite 5–10 μ longa. Paraphysibus filiformibus, septatis, copiosis, ramosis, 2.5–3.0 μ crassis, ascos superantibus. Ascosporis superne 2-stichis, inferne 1- aut 2-stichis, 4-cellularibus, plus minus cylindraceo-clavatis, 38–44 × 10–13 μ, demum atro-brunneis opacisque, transverse septatis, profunde constrictis,



FIGS. 41–43. *Sporormiella muskokensis* (TRTC 37526). Fig. 41. Perithecium, × 40. Fig. 42. Ascus with ascospores, × 430. Fig. 43. Ascospores, × 920. FIGS. 44–46. *Sporormiella lageniformis* (TRTC 36610). Fig. 44. Perithecium, × 40. Fig. 45. Ascus with ascospores, × 430. Fig. 46. Ascospores, × 920. FIGS. 47–49. *Sporormiella dakotensis* (Griffiths' type, NY). Fig. 47. Perithecium, × 40. Fig. 48. Ascus with ascospores, × 430. Fig. 49. Ascospores, × 920. FIGS. 50–52. *Sporormiella subtilis* (TRTC 37018). Fig. 50. Perithecium, × 40. Fig. 51. Asci with ascospores, × 430. Fig. 52. Ascospores, × 920.

cohaerentibus; superne articulo terminale ovato-conico, 10.0–13.5 × 10.5–11.5 μ; inferne articulo terminale longiore et leviter attenuato, 12.5–15 × 9.0–10.5 μ; superne articulo medio 8.0–9.0 × 12.5–13.0 μ, inferne articulo medio 8.0–10.5 × 11.5–12.5 μ. Stria germinationis obliqua usque diagonali. Strato gelatinoso hyalino late.

HOLOTYPUS: In fimo *Alcis americanae*, Alberta,

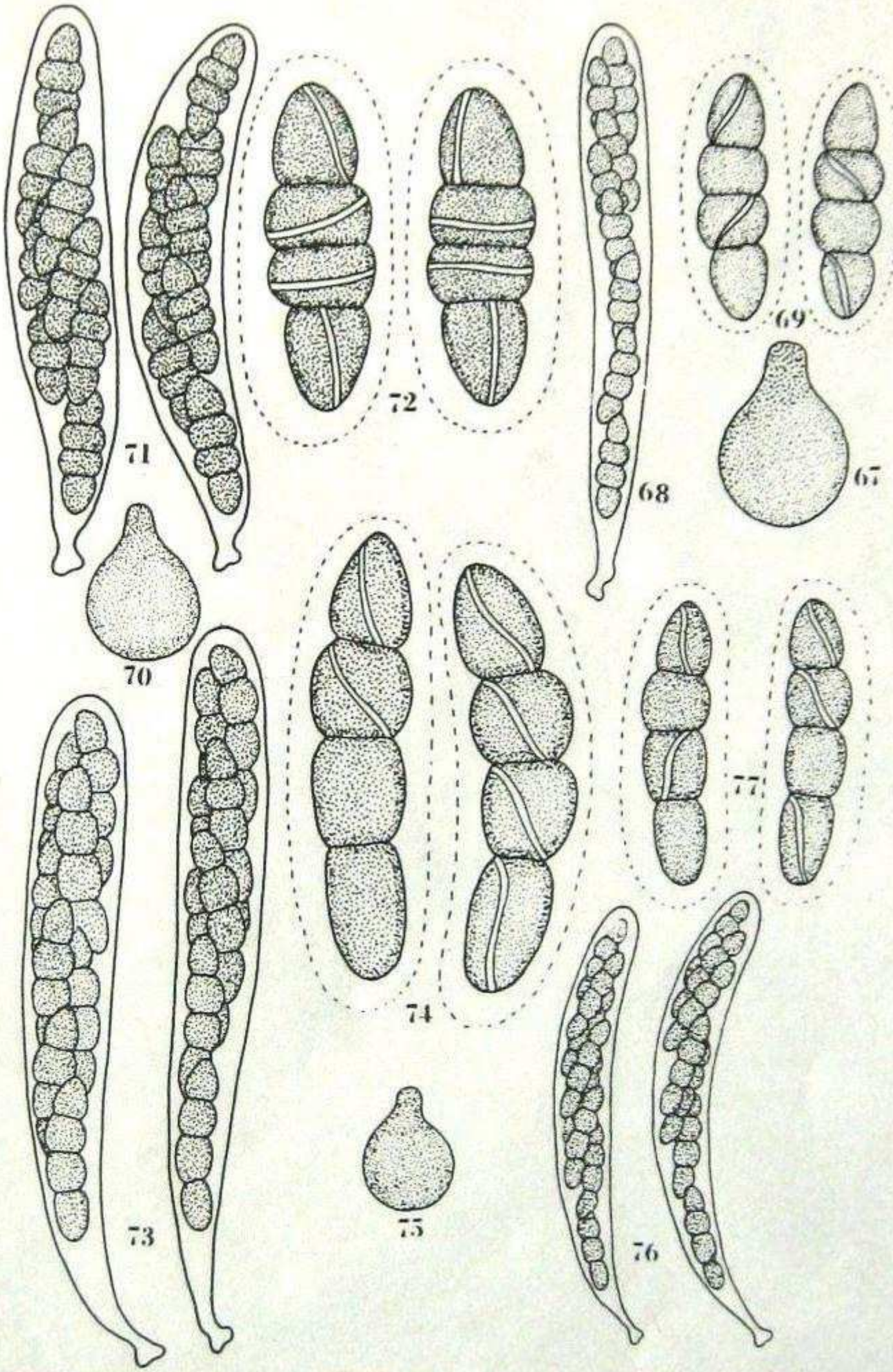


FIGS. 53-55. *Sporormiella nigropurpurea* (Ell. & Ev., type, NY). Fig. 53. Perithecium, × 40. Fig. 54. Ascus with ascospores, × 430. Fig. 55. Ascospores, × 920. FIGS. 56, 57. *Sporormiella leporina* (TRTC 38140). Fig. 56. Ascus with ascospores, × 430. Fig. 57. Ascospores, × 920. FIGS. 58–60. *Sporormiella isomera* (TRTC 36241). Fig. 58. Perithecium, × 40. Fig. 59. Asci with ascospores, × 430. Fig. 60. Ascospores, × 920. FIGS. 61–63. *Sporormiella grandispora* (TRTC 39217). Fig. 61. Perithecium, × 40. Fig. 62. Ascus with ascospores, × 430. Fig. 63. Ascospores, × 920. FIGS. 64–66. *Sporormiella dubia* (TRTC 39021). Fig. 64. Perithecium, × 40. Fig. 65. Asci with ascospores, × 430. Fig. 66. Ascospores, × 920.

Beaver Mines, 18 July 1962, *Cain*, TRTC 38980. In Cryptogamic Herbarium, University of Toronto.

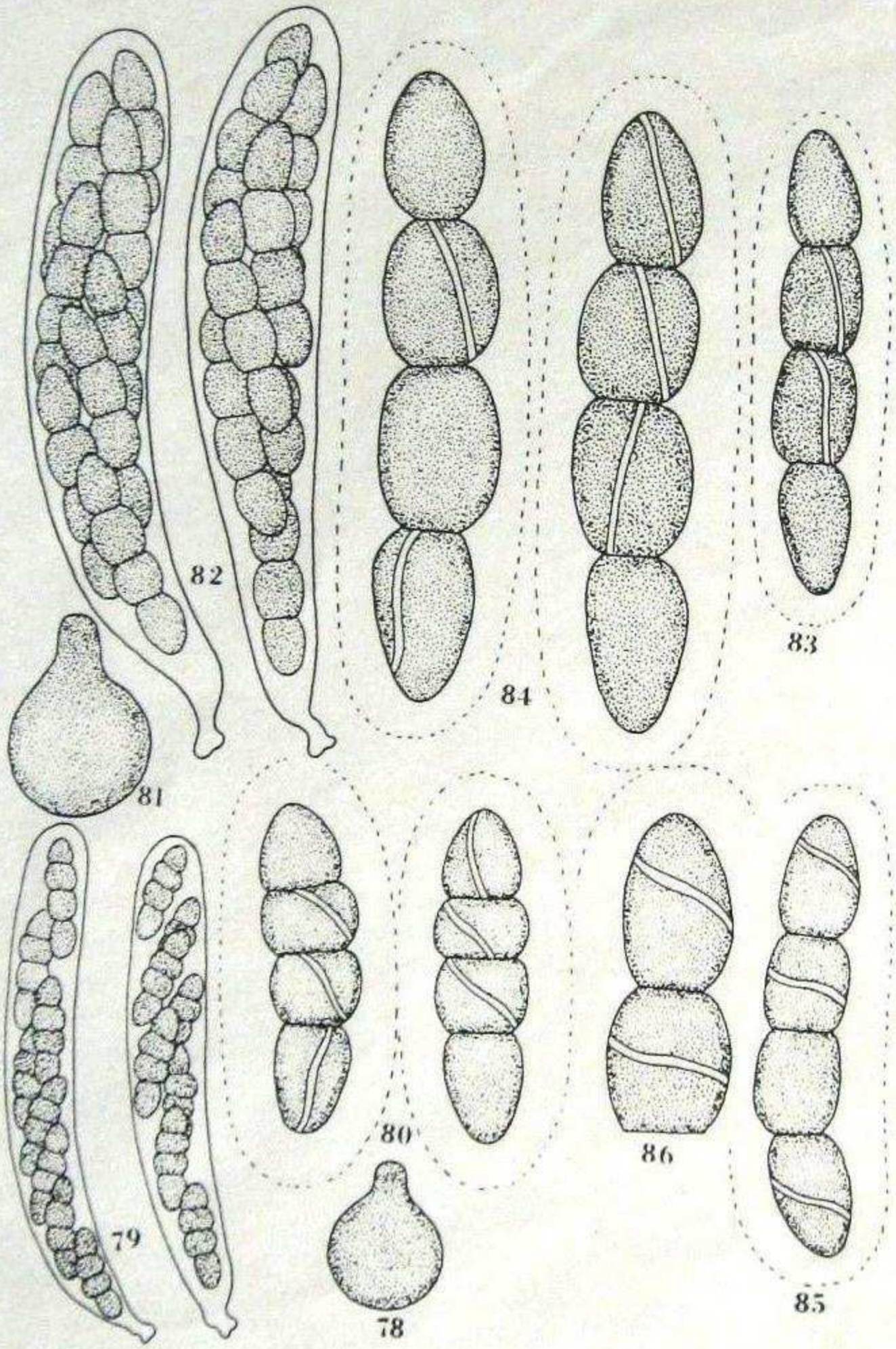
ETYMOLOGY: Greek, *alloios* = different, and *meros* = part, referring to the difference in size of the ascospore segments.

Perithecia scattered, immersed, subglobose 250–300 μ in diam, bare, smooth, dark brown to almost black; neck short, papilliform, smooth bare, black. Peridium thin, membranaceous Asci eight-spored, cylindrical-clavate, 130–150 × 20–23 μ, broadly rounded above, broadest



FIGS. 67–69. *Sporormiella cymatomera* (TRTC 39428). Fig. 67. Perithecium, × 40. Fig. 68. Ascus with ascospores, × 430. Fig. 69. Ascospores, × 920. FIGS. 70–72. *Sporormiella anisomera* (TRTC 38219). Fig. 70. Perithecium, × 40. Fig. 71. Asci with ascospores, × 430. Fig. 72. Ascospores, × 920. FIGS. 73, 74. *Sporormiella capybarae* (TRTC 36989). Fig. 73. Asci with ascospores, × 430. Fig. 74. Ascospores, × 920. FIGS. 75–77. *Sporormiella tetramera* (TRTC 37447). Fig. 75. Perithecium, × 40. Fig. 76. Asci with ascospores, × 430. Fig. 77. Ascospores, × 920.

near the upper end, contracted below into a short stipe, measuring 5–10 μ in length. Paraphyses abundant, filiform, septate, branched, guttulate, longer than and mixed with the asci, 2.5–3.0 μ in diam. Ascospores obliquely biseriate above, uni- or bi-seriate below, four-celled, nearly cylindrical-clavate, 38–44 × 11–13 μ, yellowish brown when young, becoming dark brown and opaque when mature; septa transverse; constrictions at septa broad and deep;



FIGS. 78–80. *Sporormiella alloiomera* (TRTC 38980). Fig. 78. Perithecium, × 40. Fig. 79. Asci with ascospores, × 430. Fig. 80. Ascospores, × 920. FIGS. 81–84. *Sporormiella systenospora* (TRTC 36986). Fig. 81. Perithecium, × 40. Fig. 82. Asci with ascospores, × 430. Fig. 83. Ascospores, × 660. Fig. 84. Ascospores, × 920. FIGS. 85, 86. *Sporormiella pyriformis* (with *Sporormia antarctica* Speg. LPS 3500). Fig. 85. Ascospore, × 660. Fig. 86. Part of ascospore, × 920.

cells not easily separable; apical cell ovoid-conical, about 10.0–13.5 × 10.5–11.5 μ; upper mid-cell widest, 8.0–9.0 × 12.5–13.0 μ; lower mid-cell 8.0–10.5 × 11.5–12.5 μ; basal cell longest of all, 12.5–15 × 9.0–10.5 μ, narrower towards the end; germ slit oblique to diagonal; gelatinous sheath hyaline, broad.

HABITAT: On dung of moose and sheep.

SPECIMENS EXAMINED: CANADA: Alberta: TRTC 38980 (HOLOTYPE) 38990. UNITED STATES: Wyoming: Albany Co., TRTC 41522.

3. ***Sporormiella americana*** (Griff.) Ahmed & Cain, comb. nov. Figs. 120–123

BASIONYM: *Sporormia americana* Griff., Mem. Torrey Bot. Club, 11: 114. 1901.

Perithecia scattered, immersed, firmly attached to the substrate, subglobose, 200–250 μ in diam, smooth, bare, black; neck small, papilliform, smooth, bare, black. Peridium membranaceous to coriaceous. Asci eight-spored, cylindrical-clavate, 160–220 × 25–30 μ, broadly rounded above, broadest near the apex; gradually narrowing below into a short, rather stout stipe, 10–15 μ in length. Paraphyses abundant, filiform, septate, guttulate, sparingly branched, longer than and mixed with the asci, 3.0–3.5 μ in diameter. Ascospores bi- or tri-seriate, seven-celled, fusiform-cylindrical, 52–63 × 10–13 μ, dark brown and opaque when mature, septa transverse, constrictions at septa broad and deep, segments not easily separable; third cell from the upper end larger than the remainder, cells narrowing gradually toward each end, terminal cells more or less ovoid, longer than broad, remaining cells broader than long; germ slit oblique to diagonal, gelatinous sheath broad, hyaline.

HABITAT: On dung of cow, deer, goat, and rabbit.

TYPE: Gunnison, Colorado, U.S.A.

SPECIMENS EXAMINED: CANADA: Ontario: Brant Co., RFC 6494. UNITED STATES: Colorado: Gunnison Co. (TYPE, NY). Moffat Co., TRTC 33709, 35522. Park Co., TRTC 38093. Saguache Co., TRTC 38055. Kansas: Rooks Co., TRTC 39382. Montana: Prairie Co., TRTC 35739. Nevada: Elko Co., TRTC 35730. N. Dakota: Billings Co., TRTC 36203, 36223. S. Dakota: Meade Co., TRTC 39434. Utah: Duchesne Co., TRTC 36236, 36296. MEXICO: San Luis Potosi, TRTC 39775.

4. ***Sporormiella anisomera*** Ahmed & Cain, sp. nov. Figs. 70–72

Perithecíis sparsis, immersis, subglobosis usque piriformibus, 340–400 × 250–300 μ, nigris, denudatis; collo breve conico, circa 80–90 μ, crasso, nigro, denudato. Peridio coriaceo. Ascis octosporis, cylindraceo-clavatis, 125–175 × 22–26 μ, superne late rotundatis, superne mediam partim latissimis, inferne attenuatis, breve stipitatis; stipite usque ad 15 μ longa. Paraphysibus filiformibus septatis, ascos superantibus. Ascosporis 2- aut 3-seriatis, 4-cellularibus, fusiformibus, 38–43 ×12–15 μ, rectis demum atro-brunneis, transverse septatis, profunde constrictis; articulis terminalibus longioribus et per attenuatis, 12–14 × 10.5 μ; articulis mediis 7.5 × 11–13 μ. Stria germinationis parallela usque leviter obliqua in articulis terminalibus; stria germinationis transversa usque aliquantum obliqua in articulis mediis. Strato mucoso hyaline angusto.

HOLOTYPUS: In fimo vaccino, Mexico, Hidalgo, Zimapan, 21 Aug. 1961, *Cain*, TRTC 38219. In Cryptogamic Herbarium, University of Toronto.

ETYMOLOGY: Greek, *anisos* = unequal, and *meros* = part, referring to the difference in size of the terminal segments compared to the central ones.

Perithecia scattered, immersed, subglobose to slightly pyriform, 340–400 × 250–300 μ, smooth, bare, black; neck small, conical, about 80–90 μ broad, smooth, bare, black. Peridium coriaceous. Asci eight-spored, cylindrical-clavate, 125–175 × 22–26 μ, broadly rounded above, slightly narrower near the upper end, broadest above the middle, tapering below into a stout stipe, measuring up to 15 μ in length. Paraphyses filiform, septate, slightly longer and mixed with the asci. Ascospores bi- or tri-seriate, four-celled, fusiform, 38–43 × 12–15 μ, straight, light brown when young, becoming dark brown when mature; septa transverse; constrictions at septa broad and deep; terminal cells longer than the mid-cells, conspicuously narrowed toward the ends, almost equal in size, measuring about 12–14 × 10.5 μ; mid-cells measuring 7.5 × 11–13 μ, nearly equal in size; germ slit parallel to slightly oblique in the terminal cells, transverse to obliquely transverse in the mid-cells; gelatinous sheath hyaline, narrow.

HABITAT: On dung of burro and cow.