

## DEMATIACEOUS HYPHOMYCETES. VI

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FOR kindly making available to me their own collections and those in their keeping I wish to thank Professors J. C. Lindquist and E. Müller; Drs. C. E. B. Bonner, R. W. G. Dennis, A. Pilát, C. T. Rogerson, C. Schmitt, and S. Tóth. Especially interesting collections have been made by A. Angus, W. G. Bramley, E. A. Ellis, Prof. C. J. Hickman, A. Johnston, P. W. Sellar, and Dr. S. A. J. Tarr. Herb. IMI identification numbers are given in round brackets.

## ARTHRINIUM

*Arthriniium* Kunze ex Fries, 1821  
*Camptoum* Link, 1824  
*Gontosporium* Link, 1824  
*Sporophleum* Nees ex Link, 1824  
*Papularia* Fries, 1825  
*Gonatosporium* Corda, 1839  
*Microtypha* Spegazzini, 1910  
*Tureenia* Hall, 1915  
*Pseudobasidium* Tengwall, 1924  
*Phaeoharziella* Loubière, 1924  
*Innatospora* van Beyma, 1929  
*Racemosporium* Mme. & F. Moreau, 1941

### GENERIC DESCRIPTION

*Colonies* compact or widely effused, usually black or dark blackish brown; fructifications occasionally erumpent but usually superficial and often pulvinate. *Mycelium* partly superficial and partly immersed in the substratum, often with connecting hyphae which become very narrow where they pass through the host cuticle. *Conidiophore mother cells* subspherical, ampulliform, barrel-shaped or broadly clavate, arising from cells of a superficial or erumpent mycelial mat. *Conidiophores* arising singly from conidiophore mother cells, simple, often narrow, more or less cylindrical, usually colourless except for the thick transverse septa which may be highly refractive and are often brown or dark brown; growth in length takes place only at the base. *Conidia* lateral and sometimes also terminal, usually formed on very short pegs, 1-celled, distinctively shaped, often flattened and with a hyaline rim or germ slit, brown or dark brown, smooth in most species. *Sterile cells* when present terminal or subterminal in place of conidia, usually smaller, paler and not the same shape as conidia, often containing one or more highly refractive cubical bodies. *Setae* none.

*Type species: Arthriniium caricicola* Kunze ex Ficinus & Schubert.

KEY

Conidia truncate at base, often verruculose . . . . .	<i>spgazzinii</i> (1)
Conidia not truncate at base, always smooth . . . . .	1
1. Conidia round, almost round or polygonal in face view . . . . .	2
Conidia not round or regularly polygonal in face view . . . . .	8
2. Conidia nearly all polygonal in face view . . . . .	<i>puccinioides</i> (2)
Conidia nearly all round or almost round in face view . . . . .	3
3. Conidia lenticular . . . . .	4
Conidia not lenticular . . . . .	7
4. Diameter of conidia in face view usually 9-10 $\mu$ . . . . .	5
Diameter of conidia in face view usually 6-8 $\mu$ . . . . .	6
Diameter of conidia in face view 4-5.5 $\mu$ . . . . .	<i>euphorbiae</i> (3)
5. Conidiophores 2-4 $\mu$ thick . . . . .	<i>saccharicola</i> (4)
Conidiophores 1-1.5 $\mu$ thick . . . . .	<i>phaeospermum</i> (5)
6. Conidiophores 1-1.5 $\mu$ thick, septa numerous, brown . . . . .	<i>sacchari</i> (6)
Conidiophores 0.5 $\mu$ thick, septa few, hyaline . . . . .	<i>Apiospora montagnei</i> (7)
7. Conidia 7-9 $\mu$ diam. in face view . . . . .	<i>sphaerospermum</i> (8)
Conidia 5-6 $\mu$ diam. in face view . . . . .	<i>urticae</i> (9)
8. Conidia curved . . . . .	9
Conidia not curved . . . . .	12
9. Conidia with 2 ends tapered to form horns . . . . .	10
Conidia without horns . . . . .	11
10. Horns curved outwards . . . . .	<i>cuspidatum</i> (10)
Horns curved inwards . . . . .	<i>luzulae</i> (11)
11. Conidia 8-11 $\times$ 5-6 $\mu$ . . . . .	<i>curvatum</i> var. <i>minus</i> (12)
Conidia 11-15 $\times$ 6-8 $\mu$ . . . . .	<i>Pseudoguignardia scirpi</i> (13)
12. Conidia oblong or irregular in outline . . . . .	<i>morthieri</i> (14)
Conidia limoniform, fusiform, navicular, oval or elliptical . . . . .	13
13. Conidia over 35 $\mu$ long . . . . .	<i>caricicola</i> (15)
Conidia under 16 $\mu$ long . . . . .	<i>sporophleum</i> (16)
Conidia 17-25 $\mu$ long . . . . .	14
14. Conidia oval or elliptical 12-14 $\mu$ broad . . . . .	<i>lobatum</i> (17)
Conidia limoniform, fusiform or navicular 6-9 $\mu$ broad . . . . .	<i>ushuvaiense</i> (18)

(1) *Arthrinium spgazzinii* Subramanian, 1956, *Proc. Indian Acad. Sci.*, Sect. B, 44, p. 124.

*Microtypha saccharicola* Spegazzini, 1910, *An. Mus. nac. Hist. nat. B. Aires*, 20, p. 432 (non *Arthrinium saccharicola* Stevenson).

*Colonies* at first compact, round, pulvinate, becoming confluent, black. *Mycelium* partly superficial, partly immersed in the substratum; superficial part composed of a network of branched and anastomosing, septate, pale to mid olivaceous brown, smooth-walled, 1.5-5.5 $\mu$  thick hyphae; immersed hyphae subhyaline to rather pale olivaceous brown, 1-4 $\mu$  thick. *Conidiophore mother cells* subspherical to barrel-shaped, 4-5  $\times$  4-5 $\mu$ . *Conidiophores* erect or ascending, simple, straight or flexuous, cylindrical, colourless except for the thick, brown to dark brown, transverse septa, smooth-walled, 15-140 $\mu$  long, 3-4.5 $\mu$  thick. *Conidia* clavate, oval or elliptical, truncate at the base, golden brown, smooth or verruculose, 5-8 (6.5)  $\times$  3-6 (4.1) $\mu$ . *Sterile cells* none.

On sugar cane (*Saccharum officinarum*), Jujuy, Ledesma, Argentina, ii.1905, C. Spegazzini, 15883, type in Herb. LPS.

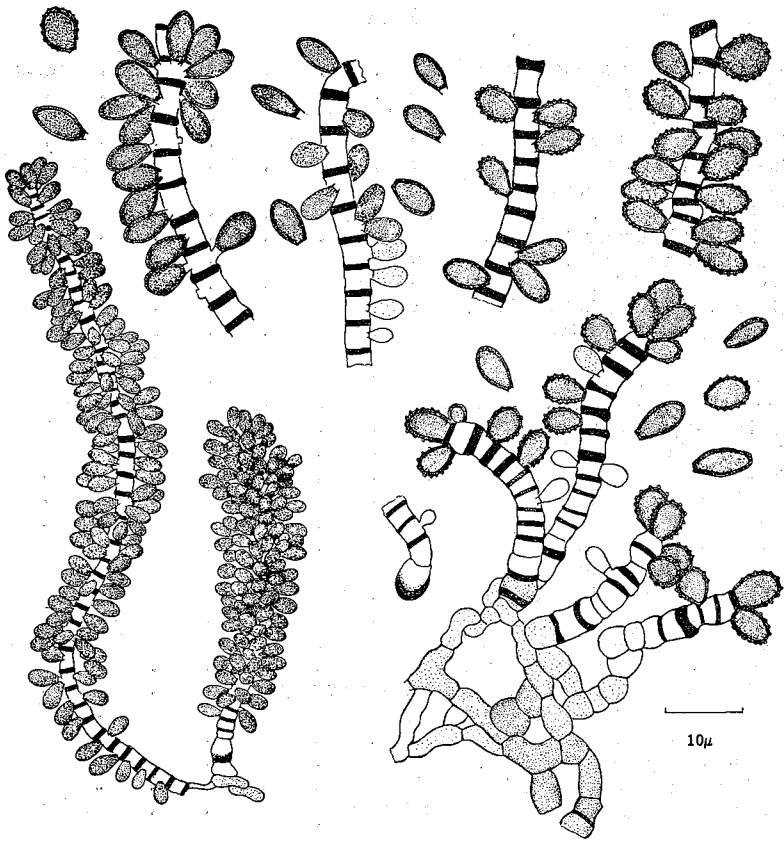


FIG. 1. *Arthrinium spgazzinii* ( $\times 650$  except where indicated by the scale).

(2) *Arthrinium puccinioides* (DC. ex M erat) Kunze, 1823, in Kunze & Schmidt's *Mykologische Hefte*, 2, p. 103; Fries, 1832, *Systema Mycol.*, 3, p. 376.

*Conoplea puccinioides* De Candolle, 1805, *Flore Franaise*, Ed. 3, Tome 2, p. 73, ex M erat, *Nouvelle Flore des environs de Paris*, 1821, p. 16.

*Goniosporium puccinioides* (DC.) Link, 1824, in Linn  Species Plantarum, ed. 4 (Willdenow's), 6, 1, p. 45.

*Gonatosporium puccinioides* (DC.) Corda, 1839, *Icones Fung.*, 3, p. 8.

*Goniosporium punctiforme* Spegazzini, 1887, *Boln Acad. nac. Cienc.*, C rdoba, 11, p. 304.

*Colonies* compact, pulvinate, usually round, occasionally oval, 70–370 $\mu$  in diameter, dark blackish brown. *Mycelium* partly superficial, partly immersed in the substratum; superficial part composed of a network of branched and anastomosing, colourless to brown, smooth-walled, 3–6 $\mu$  thick hyphae; immersed hyphae colourless to pale brown, 1–6 $\mu$  thick. *Conidiophore mother cells* subspherical, lageniform or barrel-shaped, 4–5  $\times$  3–6.5 $\mu$ . *Conidiophores*

erect or ascending, simple, straight or flexuous, cylindrical, colourless except for the thick brown or dark brown transverse septa, smooth-walled, 25–130 $\mu$  long, 2–4 $\mu$  thick. *Conidia* brown, often with concentric pale and darker rings

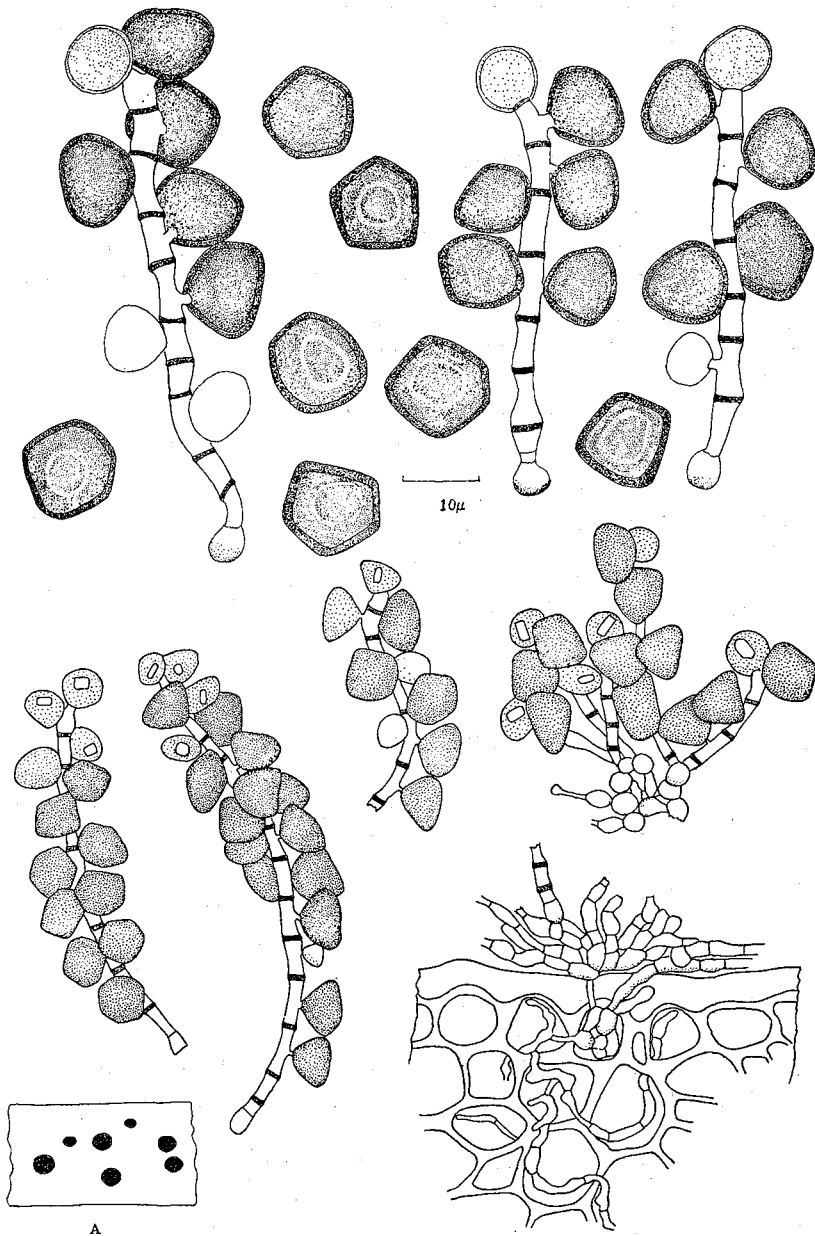


FIG. 2. *Arthrimum puccinioides*  
(A, habit sketch; other figs.  $\times 650$  except where indicated by the scale).

when examined by transmitted light, smooth-walled, polygonal and 9–14 (11·6) $\mu$  diam. in face view, hemispherical to triangular and 7–9 $\mu$  thick in side view. *Sterile cells* spherical, triangular or polygonal, pale, 6–9 $\mu$  diam.

On *Carex acuta*, *C. acutiformis*, *C. appropinquata*, *C. elata*, *C. flacca*, *C. hirta*, *C. riparia*, *C. rostrata*, *Deschampsia caespitosa*, *Eleocharis palustris* and *Scirpus tabernaemontani*; specimens seen from Belgium, France, Germany, Great Britain, and Tierra del Fuego.

#### SPECIMENS EXAMINED

*Gonatosporium puccinioides* folder in *Herb. K.*

On *Carex acuta*, Bayreuth, Bavaria, v. 1875, Thümen's Mycotheca universalis, 478 [as *Goniosporium*]. On *C. hirta*, Noidan, Côte d'Or, France, vi.1879, F. Fautrey, C. Roumeguère's *Fungi selecti*, 5032 [as *Goniosporium*]; Dresden, Germany, 1871–72, Rabenhorst's *Fungi europaei*, 1760 [as *Arthrimum*]. On *C. rostrata*, Siegen, Haimhen, vi.1924, A. Ludwig's *Flora von Westfalen* [as *Goniosporium*]. On *C. sp.*, M. A. Libert's *Pl. crypt. Arduennae*, Fasc. 3, 283 [as *Goniosporium*]. On *Deschampsia caespitosa*, Ryde, *Herb. Berk.* 1879.

*Goniosporium punctiforme* folder in *Herb. LPS.*

On *Carex*, Tierra del Fuego, Shammacus, v.1882, C. Spegazzini, 27260.

*Arthrimum puccinioides* folder in *Herb. IMI.*

42 British collections made in Norfolk, Suffolk, Surrey, Warwicks. on species of *Carex* including *C. acutiformis*, *C. appropinquata*, *C. elata*, *C. flacca*, *C. riparia*, *Eleocharis palustris*, and *Scirpus tabernaemontani* (395, 1584b, 15385d, 15462, 15536a, 15601, 17326a, 17672a, 17862, 17992, 19622–36, 20966, 23212a, 27758, 27786, 28565, 28568, 29359, 34219, 34278, 34519, 34853a, 34890, 34897, 34956, 35242, 35712, 42026).

### (3) *Arthrimum euphorbiae* M. B. Ellis spec. nov.

*Coloniae* effusae, fuscae. *Mycelium* partim superficiale et partim in substrato immersum. *Mycelium superficiale* ex hyphis ramosis et anastomosantibus, septatis, olivaceo-brunneis, levibus, 2·5–5 $\mu$  crassis compositum. *Mycelium immersum* ex hyphis ramosis, septatis, subhyalinis vel pallide olivaceo-brunneis, levibus, 1–3 $\mu$  crassis compositum. *Conidiophora* ex cellis clavatis, subsphaericis vel doliiformibus, 4–5  $\times$  3·5–5 $\mu$  oriunda, erecta vel ascendente, simplicia, flexuosa, cylindrica, incolorata, levia, 15–110 $\mu$  longa, 0·5–1 $\mu$  crassa, septis numerosis, transversalibus, brunneis praedita. *Conidia* lenticularia, brunnea vel olivaceo-brunnea, levia, 4·5·5 (4·7)  $\times$  3–4 (3·2) $\mu$ . *Cellae steriles* acropleurogenae, hemisphaericae, 4·5  $\times$  2–3 $\mu$ . *Habitat* in caulibus emortuis *Euphorbiae*, Mkushi River Hotel, Zambia, 8. iv.1964, A. Angus, IMI 110788 typus.

*Colonies* effused, dark blackish brown. *Mycelium* partly superficial, partly immersed in the substratum; superficial part composed of branched and anastomosing, septate, olivaceous brown, smooth-walled, 2·5–5 $\mu$  thick hyphae; immersed hyphae subhyaline to pale olivaceous brown, 1–3 $\mu$  thick. *Conidiophore mother cells* clavate, subspherical or barrel-shaped, 4·5–5  $\times$  3·5–5 $\mu$ .

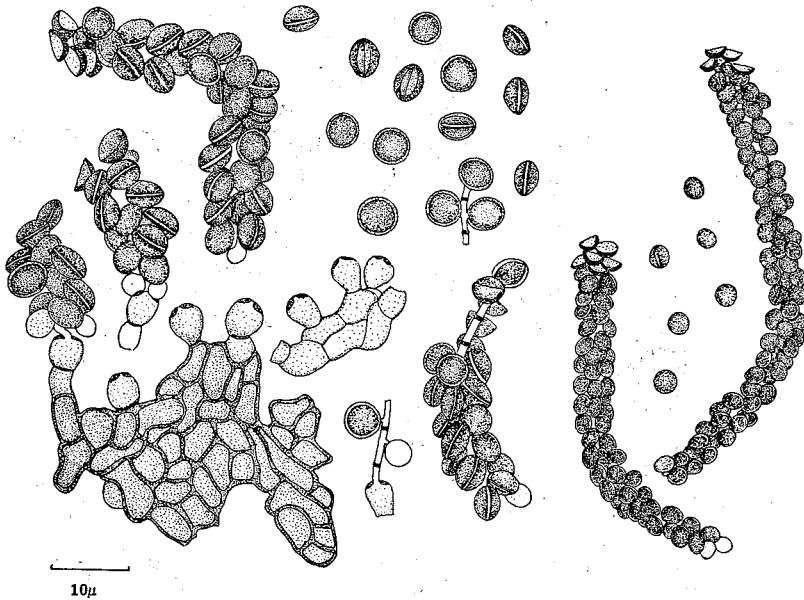


FIG. 3. *Arthrinium euphorbiae* ( $\times 650$  except where indicated by the scale).

*Conidiophores* erect or ascending, simple, flexuous, cylindrical, colourless except for the numerous brown transverse septa, smooth-walled,  $15-110\mu$  long,  $0.5-1\mu$  thick. *Conidia* lenticular, brown or olivaceous brown, smooth-walled,  $4.5-5$  ( $4.7$ ) $\mu$  diam. in face view,  $3-4$  ( $3.2$ ) $\mu$  thick. *Sterile cells*, when present, hemispherical  $4-5 \times 2-3\mu$ .

On dead stems of *Euphorbia*, Zambia.

(4) *Arthrinium saccharicola* Stevenson, 1917, apud Johnston & Stevenson, *J. Dep. Agric. P. Rico*, 1, p. 223.

*Colonies* effused, dark blackish brown to black. *Mycelium* partly superficial, partly immersed in the substratum; superficial part composed of a network of branched and anastomosing, septate, subhyaline to brown, smooth-walled,  $2-5\mu$  thick hyphae; immersed hyphae subhyaline to pale brown,  $2-4\mu$  thick. *Conidiophore mother cells* subspherical to flask-shaped,  $5-7 \times 4.5-6\mu$ . *Conidiophores* erect or ascending, simple, straight or flexuous, cylindrical, colourless except for the thick, brown or dark brown, transverse septa, smooth-walled,  $25-130\mu$  long,  $2-4\mu$  thick. *Conidia* lenticular, brown or dark brown, with a hyaline or pale band at the junction of the two sides,  $7-10$  ( $9$ ) $\mu$  diam. in face view,  $4-6$  ( $5.1$ ) $\mu$  thick. *Sterile cells* none.

On sugar-cane debris; only one specimen seen from Venezuela, collected by R. W. G. Dennis at Merida, vi.1958 (74759c).

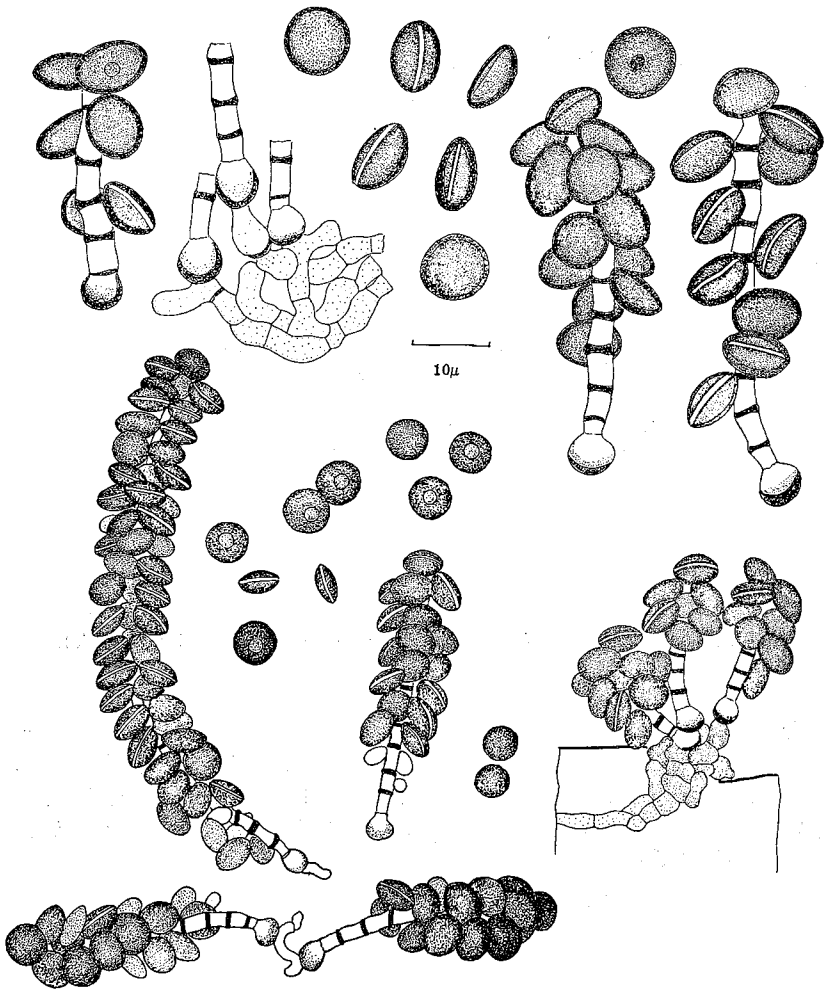


Fig. 4. *Arthrimum saccharicola* ( $\times 650$  except where indicated by the scale).

(5) *Arthrimum phaeospermum* (Corda) M. B. Ellis comb. nov.

*Gymnosporium phaeospermum* Corda, 1837, *Icones Fung.*, **1**, p. 1.

*Coniosporium phaeospermum* (Corda) Sacc., 1881, *Michelia*, **2**, p. 292.

*Stilbospora sphaerosperma* Persoon, 1795, *Usteri's neue Ann. Bot.*, **15**, p. 31,  
[non *Arthrimum sphaerospermum* Fuckel].

*Melanconium sphaerospermum* (Pers.) Link, 1825, in *Linné Species Plantarum*,  
ed. 4 (Willdenow's), **6**, 2, p. 91.

*Papularia sphaerosperma* (Pers.) Höhnelt, 1916, *Sber. Akad. Wiss. Wien*, **125**,  
p. 114.

*Coniosporium inquinans* Durieu & Montagne, 1849, *Flore d'Algérie, Cryptogamie*, p. 327.



*Epicoccum simplex* Berkeley & Curtis, 1875, apud Berk. in *Grevillea*, 3, No. 27, p. 100.

*Coniosporium argentinense* Spegazzini, 1910, *An. Mus. nac. Hist. nat. B. Aires*, 20, p. 430.

*Pseudobasidium bicolor* Tengwall, 1924, *Meded. phytopath. Lab. Willie Commelin Scholten*, 6, p. 38.

*Botryoconis sanguinea* Tubaki, 1952, apud Kominami, Kobayasi, & Tubaki, *Nagaoa*, 1, p. 7.

Colonies variable in structure. On leaves of *Carex*, *Glyceria*, *Phragmites*, etc., they are superficial, compact, pulvinate, round to oval, 100–500 $\mu$  diam., black. On most culms fructification commences beneath the epidermis which

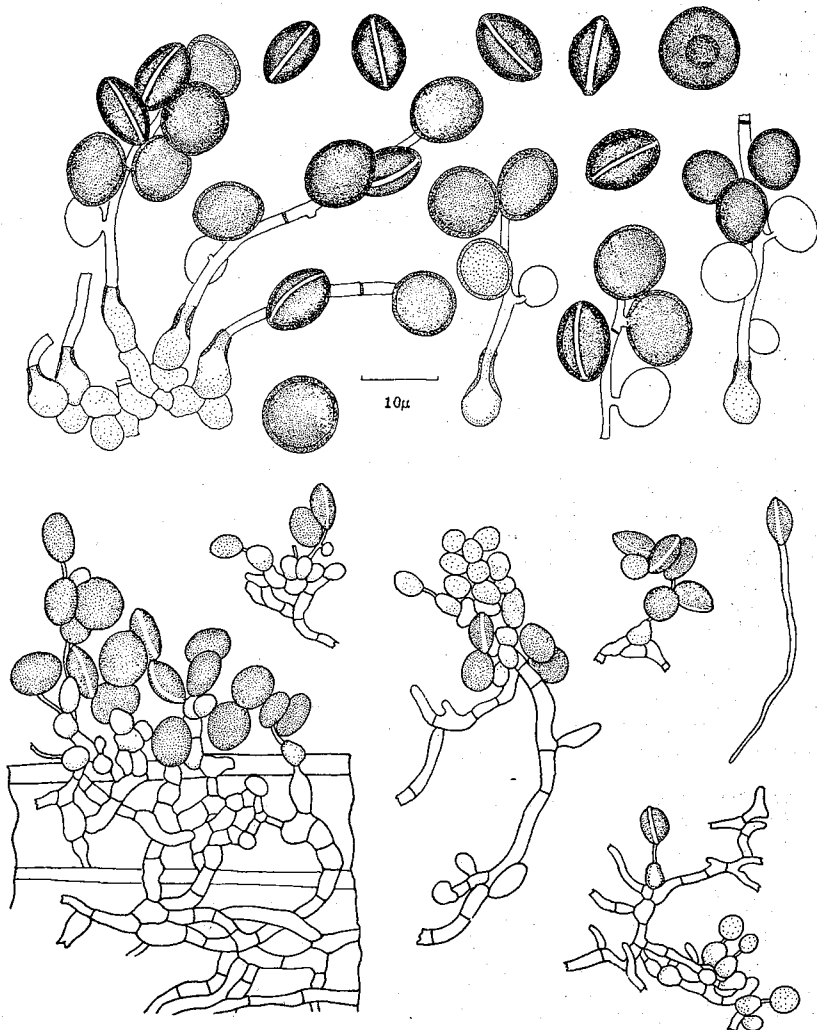


FIG. 5. *Arthrinium phaeospermum* ( $\times 650$  except where indicated by the scale).

splits longitudinally to expose the shiny black spore masses, at first 2–3 mm. long and 0.5 mm. wide, later expanding up to  $5 \times 1$  mm.; colonies become even more widely effused by the production of large numbers of superficial mycelial mats on which fresh conidiophores arise. *Mycelium* partly superficial, partly immersed in the substratum; superficial part composed of a network of branched and anastomosing, septate, colourless to pale brown, smooth-walled, 2–6  $\mu$  thick hyphae; immersed hyphae colourless, smooth or verruculose, 1–4  $\mu$  thick. *Conidiophore mother cells* lageniform, 5–10  $\times$  3–5  $\mu$ . *Conidiophores* erect or ascending, simple, flexuous, cylindrical, colourless, smooth-walled, with colourless and highly refractive or pale brown transverse septa, 5–65  $\mu$  long, 1–1.5  $\mu$  thick. *Conidia* lenticular, rather dark golden brown with a hyaline band at the junction of the two sides, 8–12 (9.9)  $\mu$  diam. in face view, 5–7 (5.9)  $\mu$  thick. *Sterile cells* none.

Common on reeds and many other substrata throughout the world. Substrata and countries are listed below under specimens examined.

#### SPECIMENS EXAMINED

*Coniosporium argentinense* *folder in Herb. LPS.*

On *Anona cherimolia*, Tucuman, 16.iv.1906, C. Spegazzini, 12915, type of *C. argentinense*.

*Coniosporium inquinans* *folder in Herb. K.*

On *Arundo mauritanica*, Algiers, authenticated for the name *C. inquinans*.

*Epicoccum simplex* *folder in Herb. K.*

On *Arundinaria* sp., South Carolina, Curtis, 1378, type of *E. simplex*.

*Culture from C.B.S.*

Isolated from *Hedera helix*, Holland, G. Kruseman as *Pseudobasidium bicolor*.

*Arthrinium phaeospermum* *folder in Herb. IMI.*

Published exsiccata. On *Bambusa*, Lichtenstein, xii.1907, H. Zimmerman, F. Petrak's Flora Bohemiae et Moraviae, Ser. 2, 515, as *Coniosporium shiraianum* (16465); Philippines, xi.1912, P. W. Graff, Sydow's Fungi exotici, 988 as *C. bambusae* (7294). On *Elymus arenarius*, Hamburg, ix.1920, A. Ludwig, Sydow's Mycotheca germanica, 1743 (16443). On *Phragmites communis*, as *Coniosporium arundinis*: Leipzig, Germany, autumn 1892, Rabenhorst-Winter-Paszschke, Fungi europaei 3996 (16463); Columbus, U.S.A., viii.1902, W. A. Kellerman's Ohio Fungi, 101 (16461); Brandenburg, x.1909, Sydow's Mycotheca germanica, 944 (7288). On *Phyllostachys bambusoides*, Japan, vi.1912, Sydow's Fungi exotici, 98, as *C. punctiforme* (7296). Isolated from soil, Tiba prefecture, Japan, 1951, K. Tubaki, type of *Botryoconis sanguinea* (51577). One hundred and thirty five collections on *Agropyron repens*, *Ammophila arenaria*, *Arrhenatherum elatius* var. *tuberosum*, *Arundinaria* spp., *Bambusa* species including *B. arundinaria*, *B. bambos*, *B. vulgaris*, *Brassica campestris*, *Calamagrostis canescens*, *Carex acutiformis*, *C. riparia*, *Citrus* sp., *Cladium mariscus*, *Cortaderia selloana*, *Glyceria maxima*, *Gynerium argenteum*, *Justicia gendarussa*, *Magnolia grandiflora*, *Musa paradisiaca*, *Nicotiana tabacum*, *Panicum antidotale*, *P. maximum*, *Phragmites communis*, *Picea sitchensis*, *Pinus sylvestris*, *Pteris aquilinum*, *Rauwolfia serpentina*, *Sorghum vulgare*, *Trifolium* sp., *Valeriana officinalis*, *Zea mays*, soil, and wood of cooling towers, from Canada, Channel Islands (Guernsey and Sark), Cyprus, England (Berks., Cambs., Cornwall, Isles of Scilly, Kent, Mddx., Norfolk, Suffolk, Surrey, Yorks.), India, Kenya, Malawi, Netherlands, Pakistan, Portugal, Rhodesia, Sierra Leone, Sudan, Sweden, Wales, and Zambia (7262–3, 7267, 7285–7, 7289, 7291, 10545, 10987, 15359, 15362–3, 15413a, 15540b, 16460, 17321a, 17324, 17352, 19619, 19620, 19827, 21077f, 21149i, 21389, 28471a, 28540, 29213, 29425–66, 31257b, 31258a, 31486, 31521, 31531–2, 31553, 31578, 31613, 31680, 32026, 32201, 32392a, 32605, 34231, 34518, 34623, 37104, 37535a, 37890, 37892, 43538, 45236, 48544, 49549, 51534, 52639, 56361, 60232, 61462, 63305a, 63333, 63561, 63775, 68321, 68514, 79811, 84403, 85052, 85210, 85399, 85405, 85837, 89497, 90103, 91100, 91289, 91678, 92582, 92952b, 92954, 92998b, 93027, 95168b, 95185k, 95385a, 95770, 100371–3, 102660c, 102973, 103014, 105254, 110698).

(6) *Arthrinium sacchari* (Speg.) M. B. Ellis comb. nov.

*Coniosporium sacchari* Spegazzini, 1896, *Revta Fac. Agron. Univ. nac. La Plata*, 2, p. 248.

*Colonies* compact, pulvinate, round, oval or linear, or sometimes effused, dark blackish brown to black. *Mycelium* partly superficial, partly immersed in the substratum; superficial part composed of a network of branched and

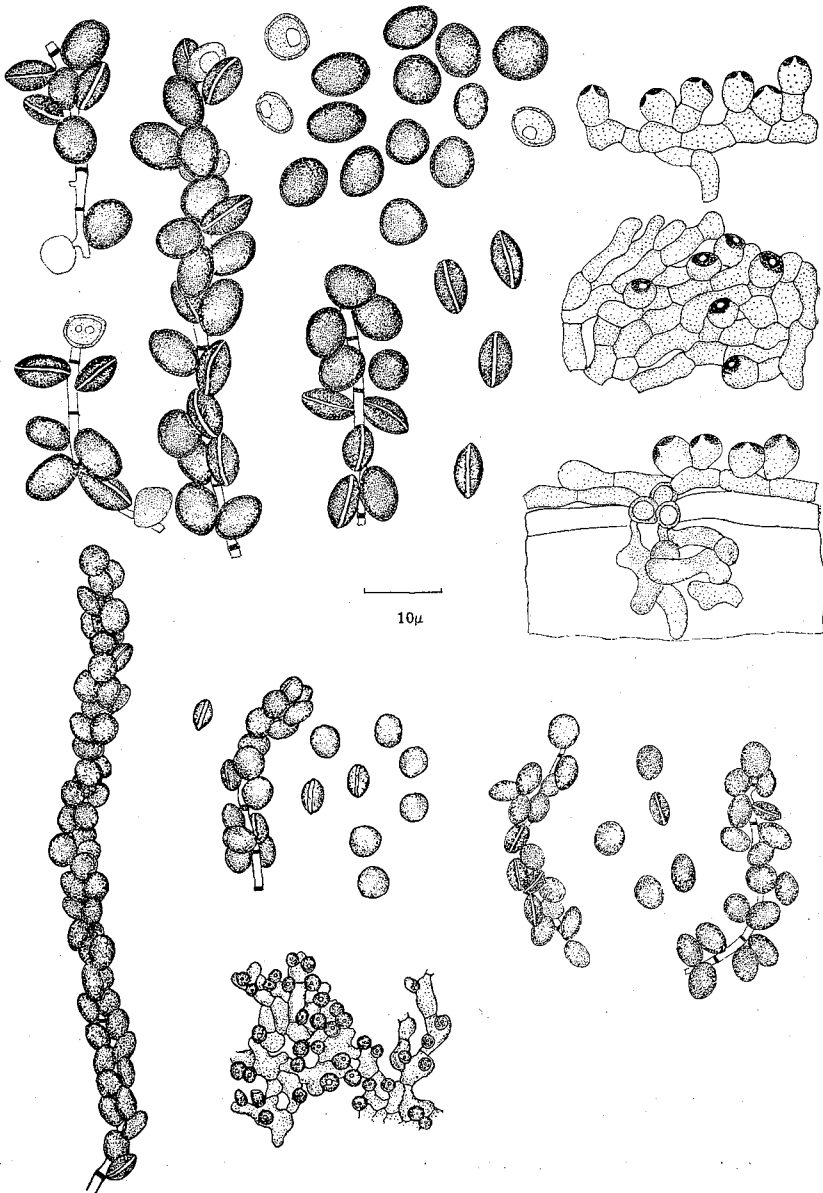


FIG. 6. *Arthrinium sacchari* ( $\times 650$  except where indicated by the scale).

anastomosing, septate, subhyaline to rather pale olivaceous brown, smooth-walled, 2–5 $\mu$  thick hyphae; immersed hyphae pale brown to brown, 1–7 $\mu$  thick. *Conidiophore mother cells* subspherical to clavate, 3–6  $\times$  4–5.5 $\mu$ . *Conidiophores* erect or ascending, simple, flexuous, cylindrical, colourless except for the thick, brown, transverse septa, smooth-walled, 40–130 $\mu$  long, 1–1.5 $\mu$  thick. *Conidia* lenticular, dark brown, with a hyaline or pale band at the junction of the two sides, 6–8 (7.0) $\mu$  in diameter in face view, 3–4 (3.8) $\mu$  thick. *Sterile cells* sometimes present, flattened, round or nearly round in face view.

Common on grasses, especially sugarcane, and occasionally found on other plants, mainly in the tropics; specimens have been seen from Argentina, Ghana, India, Nigeria, Pakistan, Wales, and Zambia.

#### SPECIMENS EXAMINED

*Coniosporium sacchari* *folder in Herb. LPS.*

On *Saccharum officinarum*, Tucuman, Argentina, iv.1894, C. Spegazzini, 12925, type.

*Arthrimum sacchari* *folder in Herb. IMI.*

On leaves, stems and roots of *Ananas comosus*, *Andropogon sorghum*, *Aristida* sp., *Beckeropsis uniseta*, *Borassus aethiopicum*, *Chloris gayana*, *Hyparrhenia filipendula*, *H. variabilis*, *Ipomoea batatas*, *Musa* sp., *Polygonum baldschuanicum*, *Saccharum munja*, *S. officinarum*, *S. spontaneum*, in Ghana, India, Nigeria, Pakistan, Wales, and Zambia (6452, 37872f, 37924e, 37969b, 46783b, 81081, 83218, 90072a, 91102b, 91562, 93882a, 93883a, 93887–8, 95104b, 95126a, 95141a, 95370a, 96626a, 98841, 98842, 99397a).

(7) *Arthrimum* state of *Apiospora montagnei* Saccardo, 1875, *Nuovo G. bot. ital.*, 7, p. 306. [See H. J. Hudson, 1963, in *Trans. Brit. mycol. Soc.*, 46, pp. 19–23.]

*Gymnosporium arundinis* Corda, 1838, *Icones Fung.*, 2, p. 1.

*Papularia arundinis* (Corda) Fries, 1849, *Summa Veg. Scand.*, 2, p. 509.

*Coniosporium arundinis* (Corda) Sacc., 1880, *Michelia*, 2, p. 124.

*Torula sambuci* Fuckel, 1873, *Symb. mycol.*, Nachtr., 2, p. 77.

*Gymnosporium circumscissum* Berkeley & Broome, 1873, *J. Linn. Soc.*, 14, p. 90.

*Coniosporium circumscissum* (Berk. & Br.) Saccardo, 1886, *Sylloge Fung.*, 4, p. 244.

*Melanconium circumscissum* (Berk. & Br.) Grove, 1918, *Kew Bull.*, 1918, p. 174.

*Torula donacina* Thümen, 1877, *Mycotheca universalis*, 887.

*Gymnosporium bambusae* Thümen, 1877, *Mycotheca universalis*, 885.

*Coniosporium bambusae* (Thüm.) Saccardo, 1880, *Michelia*, 2, p. 124.

*Gymnosporium gramineum* Ellis & Everhart, 1885, *J. Mycol.*, 1, p. 44.

*Trichosporium inflatum* El Marchal, 1896, *Bull. Soc. r. Bot. Belg.*, 34 (1), p. 142.

*Epicoccum theobromae* Petch, 1925, *Ann. R. bot. Gdns. Peradeniya*, 9 (3), p. 328.

*Periconia lanata* Gilman & Abbott, 1927, *Iowa St. Coll. J. Sci.*, 1 (3), p. 315.

*Innatospira rosea* van Beyma, 1929, *Verh. K. Akad. Wet.*, Sect. 2, 26, 4, p. 5.

*Colonies* when young compact and round but soon becoming widely effused, often encircling culms and spreading along them for up to 10cm. *Mycelium* partly superficial, partly immersed in the substratum; superficial part composed of a network of branched and anastomosing, septate, colourless to pale brown, smooth-walled, 1–4 $\mu$  thick hyphae; immersed hyphae colourless, smooth-walled, 0.5–1 $\mu$  thick. *Conidiophore mother cells* subspherical to oval or barrel-shaped.

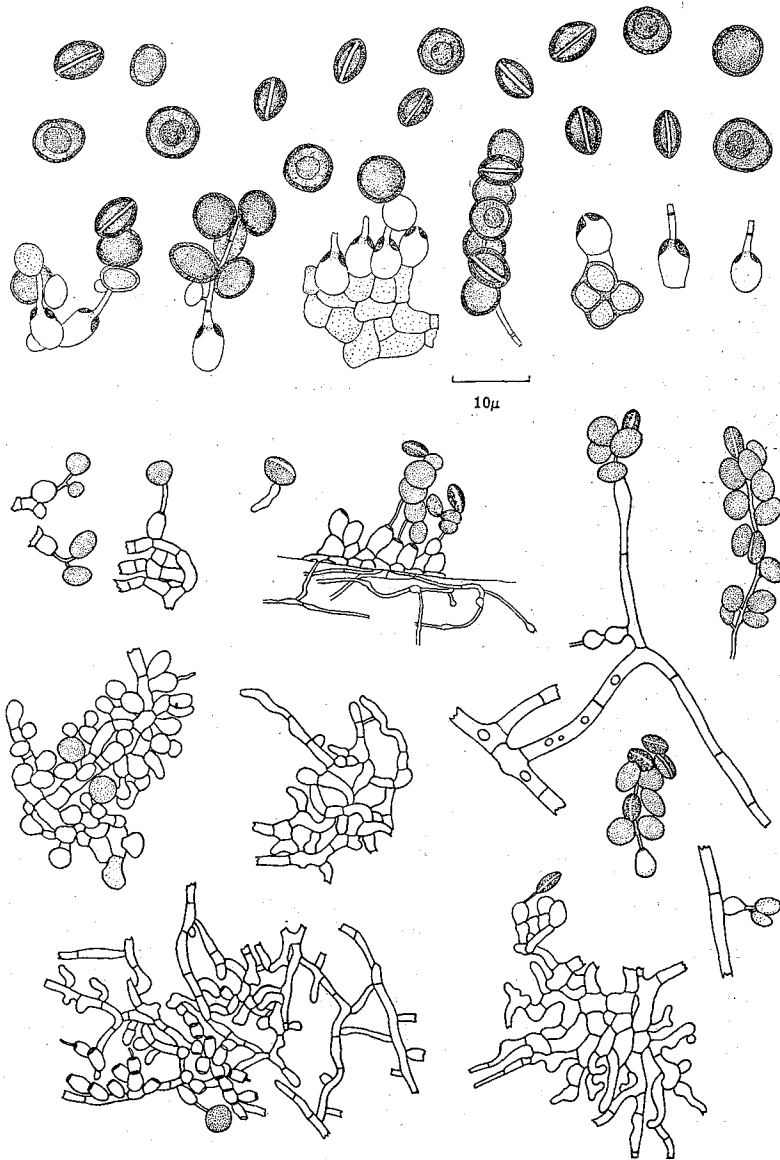


FIG. 7. *Arthrospore* state of *Apiospora montagnei*  
( $\times 650$  except where indicated by the scale).

shaped,  $5-7 \times 3-5\mu$ . *Conidiophores* erect or ascending, simple, flexuous, thread-like, colourless, smooth-walled, with a few highly refractive transverse septa,  $4-50\mu$  long,  $0.5\mu$  thick. *Conidia* lenticular, rather pale brown with a hyaline band at the junction of the two sides,  $5.5-8$  ( $6.5$ ) $\mu$  diam. in face view,  $3-4.5$  ( $3.8$ ) $\mu$  thick. *Sterile cells* none.

Common on bamboos and many other substrata throughout the world. Substrata and countries are listed below under specimens examined.

#### SPECIMENS EXAMINED

*Coniosporium bambusae* folder in *Herb. K.*

On *Bambusa arundinacea*, Istria, Görz, viii.1876, G. Bolle, Thümen's Mycotheca universalis, 885, type of *Gymnosporium bambusae*.

*Coniosporium circumscissum* folder in *Herb. K.*

On bamboo, Peradeniya, Ceylon, i.1869, *Herb. Berk.* 1879, 1050, type of *Gymnosporium circumscissum*.

*Coniosporium gramineum* folder in *Herb. N.Y.*

On *Arundinaria*, Low County, S. Carol., vi.1884, H. W. Ravenel, 4073, type of *Gymnosporium gramineum*.

*Gymnosporium arundinis* folder in *Herb. PR.*

*Gymnosporium arundinis* [scripsit Corda]—*Mus. Nat. Praha* 155522, presumed type.

*Epicoccum theobromae* folder in *Herb. K.*

On *Theobroma cacao*, Peradeniya, Ceylon, ix.1922, T. Petch, 111810, type of *E. theobromae*.

*Torula donacina* folder in *Herb. K.*

On *Arundo donax*, Athens, 1877, de Heldreich, Thümen's Mycotheca universalis, 887, type of *T. donacina*.

*Torula sambuci* folder in *Herb. K.*

On *Sambucus racemosa*, Mappen, spring, Fuckel's Fungi rhenani, 2585, type of *T. sambuci*.

Culture from *American Type Culture Collection*

Soil, Iowa, U.S.A., A.C.T.C., 1766, type of *Periconia lanata*.

Cultures from *C.B.S.*

Isolated from *Cinnamomum camphora*, Java, type of *Innatospora rosea* van Beyma (15356). Isolated from dung, Holland as *Trichosporium inflatum* (15354).

*Apiospora montagnei* folder in *Herb. IMI.*

Published exsiccata: On *Bambusa blumeana*, Manila, Philippines, xii.1912, E. D. Merrill, Sydow's Fungi exotici, 539, as *Coniosporium circumscissum* (7295). On *Bambusa*, Brandenburg, Sydow's Mycotheca germanica, 1197, as *C. bambusae* (16464). Ninety fresh collections on *Agropyron junceum*, *Ammophila arenaria*, *Arundinaria* spp., *Bambusa vulgaris* and other spp., *Carex acutiformis*, *C. riparia*, *Cucumis melo*, *Cupressus* sp., *Cyperus longus*, *Dactylis glomerata*, *Elaeis guineensis*, *Elymus arenarius*, *Hippocratea* sp., *Hyparrhenia filipendula*, *Lactuca sativa*, *Musa* sp., *Nectandra rodiaei*, *Nicotiana tabacum*, *Oxytenanthera abyssinica*, *Phalaris arundinacea*, *Phragmites communis*, *Pisum sativum*, *Saccharum officinarum*, *Sambucus nigra*, *Solanum tuberosum*, *Sorindeia juglandifolia*, *Themeda anathera*, *Theobroma cacao*, *Triticum* sp., *Urtica dioica*, *Zea mays*, cat's skin, hay and soil, from Canada, Channel Islands (Guernsey and Herm), England (Berks., Bucks., Cambs., Cornwall, Devon, Dorset, Middx., Norfolk, Surrey, Yorks.), Germany, Ghana, Jamaica, Japan, Malawi, Malaya, New Zealand, Pakistan, Papua, Philippines, Sierra Leone, Tanzania, Uganda, U.S.A., Wales, and Zambia (6611, 7258-61, 7264-66, 8108, 8242, 15357-58, 15360-61, 15364, 15981, 19790, 27370, 29360a, 29370b, 29425b, 29468-80, 31233, 31257a, 31258b, 31530a, 31614, 31617, 31650-51, 31679, 32024, 32190, 34622, 34625, 41046, 41185, 41417, 43507a, 43508a, 44045c, 44082b, 46307, 47977, 49844, 51274, 55855a, 56453g, 56893, 57379b, 57795, 58081, 58085, 61800, 62671, 68512-13, 73025, 73757a, 75100, 76091, 78290, 79812, 79870, 81764, 83220, 84079a, 87178, 87184, 89332, 95104a, 95106g, 95141b, 96219, 100495, 102531, 103343, 103347b).

(8) *Arthrinium sphaerospermum* Fuckel, 1873, *Symb. mycol.*, Nachtr., 2, p. 79.  
*Goniosporium sphaerospermum* (Fuckel) Saccardo, 1886, *Sylloge Fung.*, 4, p. 280.

*Colonies* compact, round or oval, pulvinate, up to 500 $\mu$  long, dark blackish brown. *Mycelium* partly superficial, partly immersed in the substratum; superficial part composed of a network of branched and anastomosing, septate,

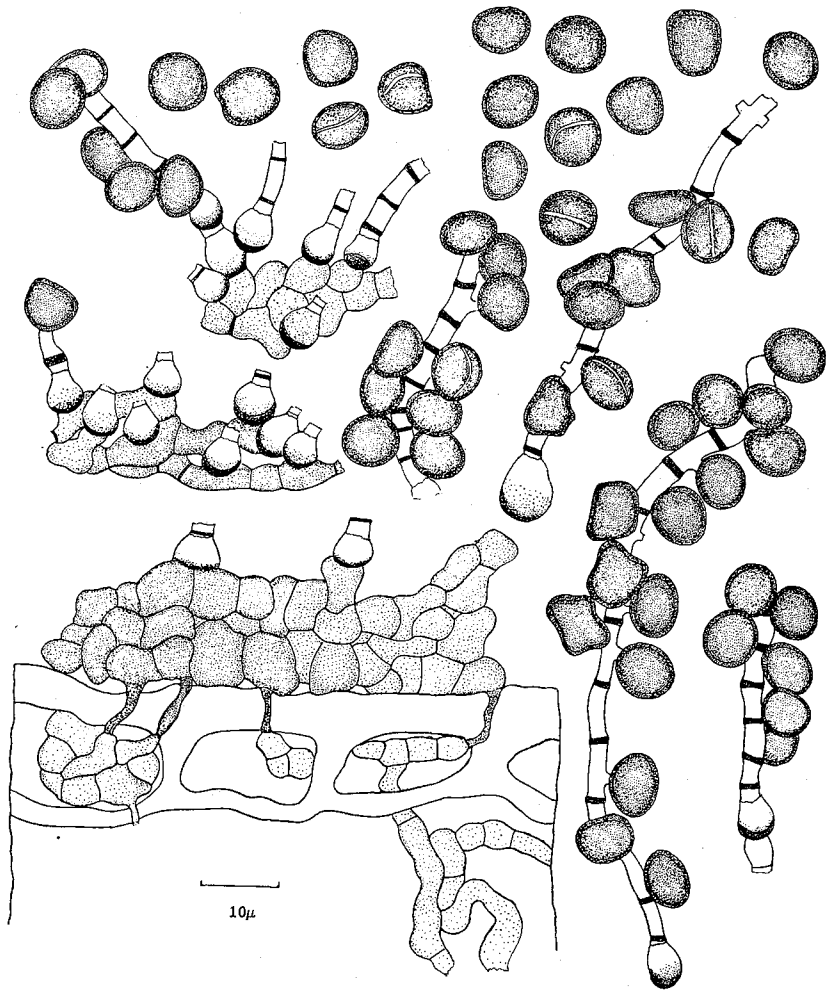


FIG. 8. *Arthrinium sphaerospermum*.

pale to mid brown, smooth-walled, 2–8 $\mu$  thick hyphae, often in two or sometimes more layers; immersed hyphae pale to mid brown, 1–7 $\mu$  thick. *Conidiophore* mother cells subspherical or flask-shaped, 5–9  $\times$  4–7 $\mu$ . *Conidiophores* erect or ascending, simple, straight or flexuous, cylindrical, colourless except for the thick, brown to dark brown, transverse septa, smooth-walled, 10–80 $\mu$

long, 2–3 $\mu$  thick. *Conidia* spherical or subspherical, mid to mid dark golden brown, smooth-walled, 7–9 (7.9) $\mu$  diam. *Sterile cells* none.

On dry leaves and leaf sheaths of *Phleum pratense*, Jura, Switzerland, iv.1872, P. Morthier, type in Herb. G.

(9) *Arthrinium urticae* M. B. Ellis spec. nov.

*Coloniae* pulvinatae, orbiculares, 100–250 $\mu$  diam., vel elongatae usque ad 1mm., fuscae vel atrae. *Mycelium* partim superficiale et partim in substrato immersum ex hyphis ramosis et anastomosantibus, septatis, hyalinis vel olivaceo-brunneis, levibus, 1–4 $\mu$  crassis compositum. *Conidiophora* ex cellis subsphaericis vel lageniformibus, 4–5  $\times$  3–5 $\mu$  oriunda, erecta vel ascendente, simplicia, recta vel flexuosa, cylindrica, incolorata, levia, 40–74 $\mu$  longa, 1.5–2 $\mu$  crassa,

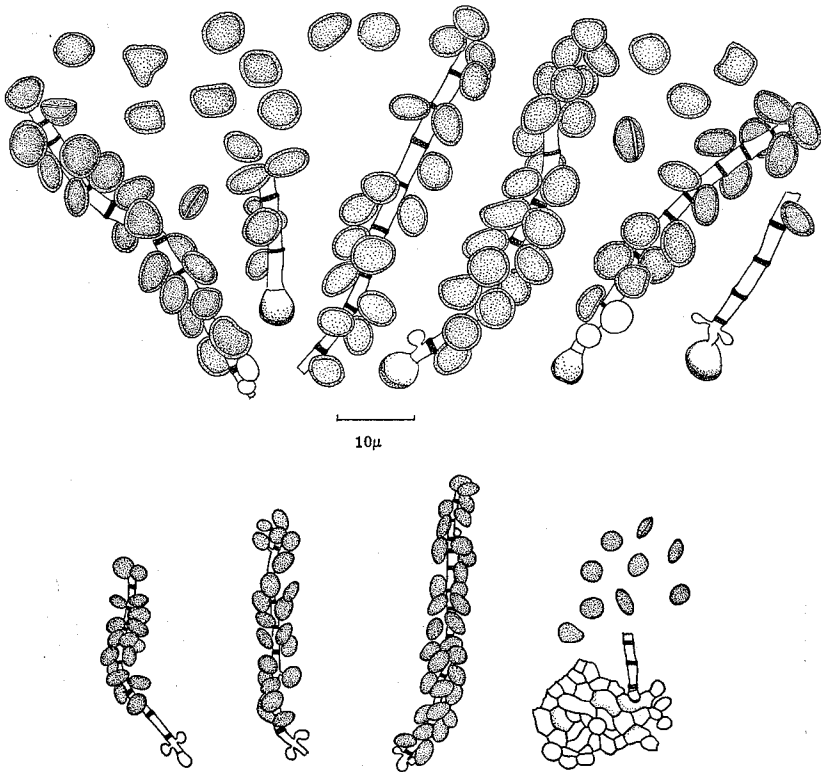


FIG. 9. *Arthrinium urticae* ( $\times$  650 except where indicated by the scale).

septis numerosis, transversalibus, brunneis vel atro-brunneis praedita. *Conidia* subsphaerica, leviter compressa, pallide brunnea, levia, 4–6 (5.6) $\mu$  diam., 3–4 (3.6) $\mu$  crassa. *Cellae steriles* nullae. *Habitat* in caulibus *Urticae dioicae*, Birmingham, England, xi.1946, C. J. Hickman, IMI 8936 typus.

*Colonies* pulvinate, round, 100–250 $\mu$  diam. or elongated up to 1mm., dark blackish brown to black. *Mycelium* partly superficial, partly immersed in the



substratum, composed of branched and anastomosing, septate, hyaline to olivaceous brown, smooth-walled, 1–4 $\mu$  thick hyphae. *Conidiophore mother cells* subspherical or flask-shaped, 4–5  $\times$  3–5 $\mu$ . *Conidiophores* erect or ascending, simple, straight or flexuous, cylindrical, colourless except for the brown or dark brown, transverse septa, smooth-walled, 40–74 $\mu$  long, 1.5–2 $\mu$  thick. *Conidia* round or almost round in face view, 5–6 (5.6) $\mu$  diam., slightly compressed and oval or elliptical in side view, 3–4 (3.6) $\mu$  thick. *Sterile cells* none.

On nettle stems, England.

(10) *Arthrinium cuspidatum* (Cooke & Harkness) Höhnelt, 1925, *Mitt. bot. Inst. tech. Hochsch. Wien*, 2 (1), p. 15, 1925.

*Camptium cuspidatum* Cooke & Harkness, 1883, apud Cooke, *Grevillea*, 12, No. 61, p. 33.

*Arthrinium bicorne* Rostrup, 1886, *Bot. Tidsskr.*, 15, p. 235.

*Turenia juncoidea* Hall, 1915, *Phytopathology*, 5, p. 57.

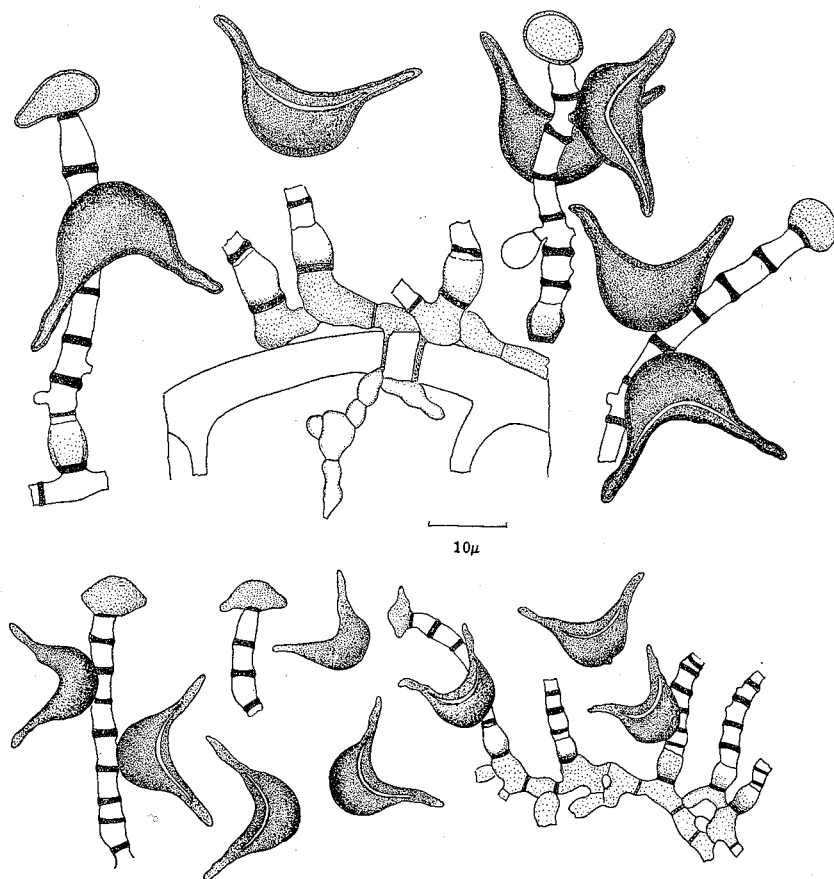


FIG. 10. *Arthrinium cuspidatum* ( $\times$  650 except where indicated by the scale).

*Colonies* compact, pulvinate, round or irregular in outline, sometimes forming bands half encircling culms or leaves and up to 1.5mm. across, dark blackish brown to black, conspicuous. *Mycelium* partly superficial, partly immersed in the substratum, superficial part composed of a network of branched and anastomosing, septate, rather pale brown, smooth-walled, 2–6 $\mu$  thick hyphae; immersed hyphae colourless or very pale brown, 1–4 $\mu$  thick. *Conidiophore mother cells* barrel-shaped, 5–7  $\times$  4–5.5 $\mu$ . *Conidiophores* erect or ascending, simple, flexuous, cylindrical, colourless except for the thick, brown or dark brown, transverse septa, smooth-walled, 32–80 $\mu$  long, 3–5 $\mu$  thick. *Conidia* curved, with the ends tapered to form outwardly curved, horn-like processes, brown to dark brown, with a hyaline germ slit, smooth-walled, 15–32 (26)  $\times$  7–11 (9.2) $\mu$ , horns 1–2 $\mu$  thick. *Sterile cells* subspherical and 7–8 $\mu$  diam., hat-shaped or lobed, pale brown.

On various species of *Juncus* including *J. ater*, *J. balticus montanus*, *J. filiformis*, *J. gerardi*, *J. jacquini* and *Scirpus*; specimens seen from Canada, England, Finland, Russia, Switzerland and U.S.A.

#### SPECIMENS EXAMINED

*Camptoum cuspidatum* folder in Herb. K.

On *Scirpus*, Calif., U.S.A., H. W. Harkness, 2071, co-type; San Francisco, U.S.A., H. W. Harkness, Rabenhorst-Winter's Fungi europaei, 3381; Hermosa, iii.1899, C. F. Baker, F. S. Earle's Plants of Southern Colorado, 17.

*Camptoum curvatum* folder in Herb. K.

On *Juncus*, Wasa, vii, Karsten's Fungi fennici, 681.

*Arthrinium bicorne* folder in Herb. K.

On *Juncus jacquini*, Switzerland, vii.1910, Jaap's Fungi selecti, 499.

*Arthrinium cuspidatum* folder in Herb. IMI.

On *Juncus ater*, Sutherland, Sask., Canada, v.1938, W. P. Fraser & R. C. Russell (6965). On *J. balticus montanus*, Lake Eldorado, Colo., U.S.A., v.1913, E. Bethel, Bartholomew's Fungi columbiani, 4509 (6966). On *J. filiformis*, Lewaschow, v.1895, Jaczewski, Komarov & Tranzschel's Fungi Rossiae, 148 (7076). On *J. gerardi*, Spurn Point, Yorks., J. Webster, v.1965.

#### 11) *Arthrinium luzulae* M. B. Ellis spec. nov.

*Coloniae* effusae, fuscae vel atrae. *Mycelium* partim superficiale et partim in substrato immersum. *Mycelium superficiale* ex hyphis ramosis et anastomosantibus, septatis, pallide olivaceo-brunneis vel olivaceo-brunneis, levibus, 2–7 $\mu$  crassis compositum. *Mycelium immersum* sparsum ex hyphis pallide olivaceo-brunneis, 1–4 $\mu$  crassis compositum. *Conidiophora* ex cellis doliformibus, 5–8  $\times$  4–6 $\mu$  oriunda, erecta vel ascendente, simplicia, recta vel flexuosa, cylindrica, incolorata, 30–80 $\mu$  longa, 3–6 $\mu$  crassa, septis numerosis, transversalibus, brunneis vel atro-brunneis praedita. *Conidia* curvata, utrimque attenuata, brunnea vel atro-brunnea, levia, 18–21 (19.5)  $\times$  12–14 (13.5) $\mu$ . *Cellae steriles* acrogenae, hemisphaericae, triangulares vel lageniformes, pallide brunneae, 5–11  $\times$  5–7 $\mu$ . *Habitat* in foliis culmisque *Luzulae*; typus in foliis culmisque

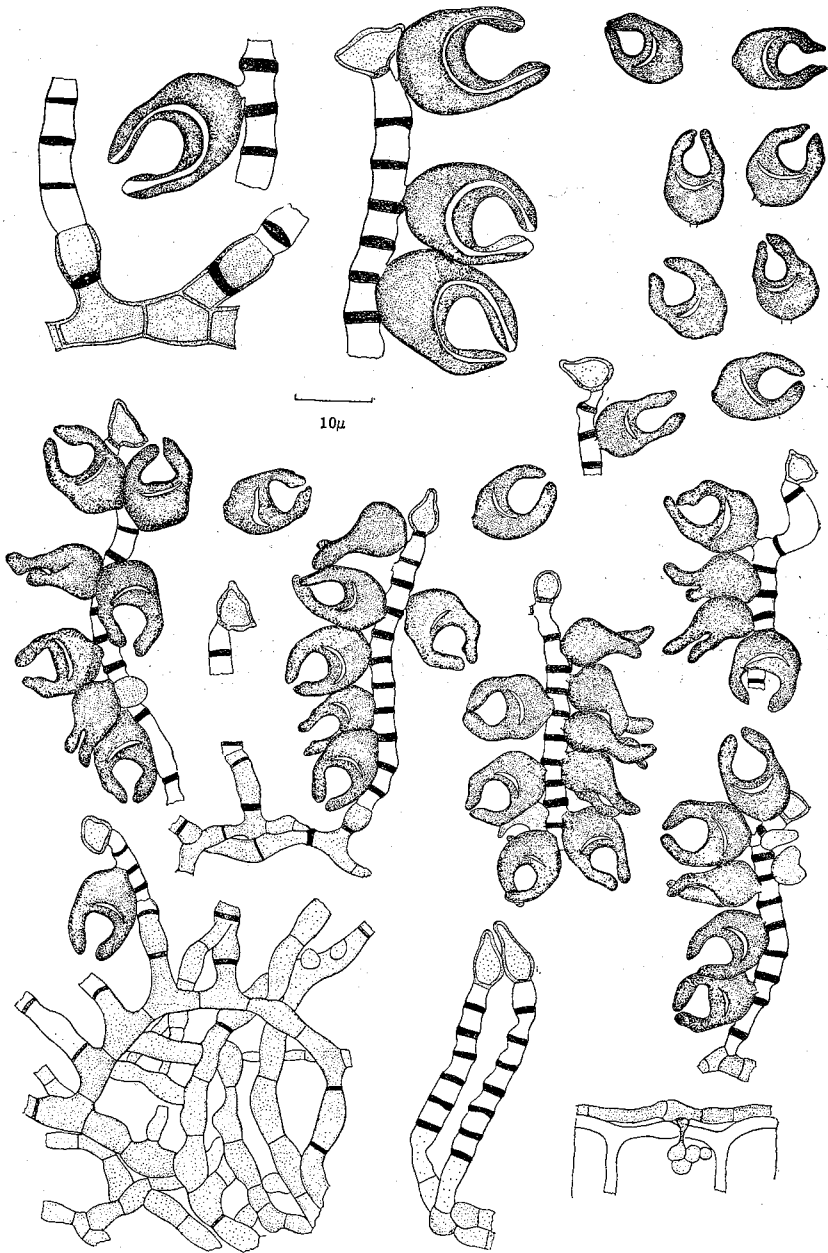


FIG. 11. *Arthrimum luzulae* ( $\times 650$  except where indicated by the scale).

*Luzulae spadiceae*, Graubunden, Albulapass, Switzerland, c. 2300m., 15. vii. 1954, E. Müller, IMI 96386.

Colonies dark blackish brown to black. *Mycelium* partly superficial, partly immersed in the substratum; superficial part composed of branched and

anastomosing, septate, pale to mid olivaceous brown, smooth-walled, 2–7 $\mu$  thick hyphae; internal part sparse, hyphae pale olivaceous brown, 1–4 $\mu$  thick. *Conidiophore mother cells* barrel-shaped, 5–8  $\times$  4–6 $\mu$ . *Conidiophores* erect or ascending, simple, straight or flexuous, cylindrical, colourless except for numerous thick, brown to dark brown, transverse septa, 30–80 $\mu$  long, 3–6 $\mu$  thick. *Conidia* curved, with the ends tapered to form inwardly curved, horn-like processes, brown to dark brown, with a hyaline germ slit, smooth-walled, 18–21 (19.5)  $\times$  12–14 (13.5) $\mu$  in face view, 8–11 $\mu$  thick, tapering at the ends of the horns to 2–4 $\mu$ . *Sterile cells* acrogenous, hemispherical, triangular or lageniform, pale brown, 5–11  $\times$  5–7 $\mu$ .

On leaves and culms of *Luzula lutea* and *L. spadicca*, Switzerland, collected by J. Braun-Blanquet, E. Müller, and A. Volkart (96386, 99593–95, 101236, 103195).

(12) *Arthrinium curvatum* Kunze var. *minus* M. B. Ellis, 1951, *Trans. Brit. mycol. Soc.*, 34, p. 501.

*Colonies* compact, round, 70–300 $\mu$  diam., very dark brown to black. *Mycelium* partly superficial, partly immersed in the substratum; superficial part composed of a network of branched and anastomosing, colourless to pale brown, smooth-

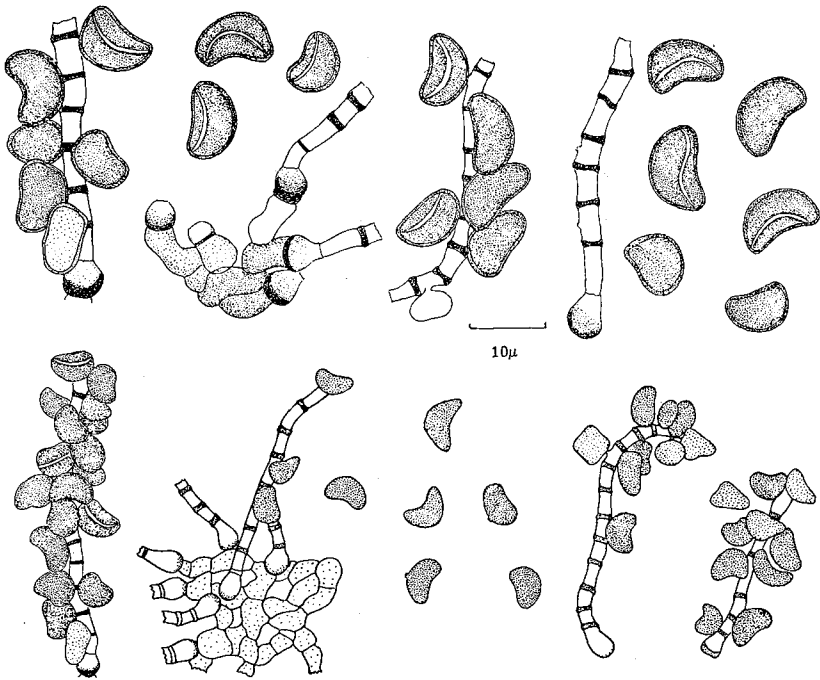


FIG. 12. *Arthrinium curvatum* var. *minus* ( $\times$  650 except where indicated by the scale).

walled, 2–7 $\mu$  thick hyphae; immersed hyphae colourless to pale brown, 1–7 $\mu$  thick. *Conidiophore mother cells* subspherical to lageniform, 4–7  $\times$  4–5.5 $\mu$ . *Conidiophores* erect or ascending, simple, flexuous, cylindrical, colourless except for the thick, brown or dark brown, transverse septa, smooth-walled, 36–74 $\mu$  long, 2–3.5 $\mu$  thick. *Conidia* curved, rounded at the ends, brown, with a hyaline germ slit, smooth-walled, 8–11 (9)  $\times$  5–6 (5.5) $\mu$ . *Sterile cells* when present, usually curved and slightly smaller and paler than conidia.

On dead leaves and culms of *Carex hirta*, *C. riparia*, *Juncus conglomeratus* and *Scirpus tabernaemontani*; specimens seen from France, Germany and Great Britain.

#### SPECIMENS EXAMINED

*Camptoum curvatum* folder in *Herb. K.*

On *Carex hirta*, Bolton Percy, Yorks., ii.1935, W. G. Bramley.

*Gonatosporium puccinioides* folder in *Herb. K.*

On *Carex*, Rouen, 1884, A. Malbranche, Roumeguère's *Fungi gallici*, 3095; Berlin, xi.1896, Sydow's *Mycotheca marchica*, 1289, as *Goniosporium puccinioides*.

*Arthrinium curvatum* var. minus folder in *Herb. IMI.*

Five British collections from Norfolk and Yorks. on *Carex hirta*, *C. riparia*, *Juncus conglomeratus*, and *Scirpus tabernaemontani* [type host] (21201a, type, 23211a, 27813–14, 34829).

(13) *Arthrinium* state of *Pseudoguignardia scirpi* Gutner, 1927, *Mat. Mikol. Fitopat. Ross.*, 6, p. 311.

*Arthrinium curvatum* Kunze, 1823, in Kunze & Schmidt's *Mykologische Hefte*, 2, p. 103; Fries, 1832, *Systema Mycol.*, 3, p. 377.

*Camptoum curvatum* (Kunze) Link, 1824, in Linné, *Species Plantarum*, ed. 4 (Willdenow's), 6, 1, p. 44.

*Colonies* amphigenous, compact, oval to round, often confluent, 140–500  $\times$  160–600 $\mu$ , dark brown. *Mycelium* partly superficial, partly immersed in the substratum, with very narrow connecting hyphae passing through the host cuticle; superficial part composed of a network of branched and anastomosing, colourless to brown, smooth-walled, septate, 3–7 $\mu$  thick hyphae, often in two or more layers; immersed hyphae colourless to very pale brown, 1–7 $\mu$  thick. *Conidiophore mother cells* subspherical to lageniform, 5–6  $\times$  4–6 $\mu$ . *Conidiophores* erect or ascending, simple, straight or flexuous, cylindrical, colourless except for the thick, brown or dark brown, transverse septa, smooth-walled, 46–90 $\mu$  long, 2.5–3.5 $\mu$  thick. *Conidia* curved, rounded at the ends, with a hyaline germ slit, smooth-walled, 11–15 (13)  $\times$  6–8 (7.2) $\mu$ . *Sterile cells* sometimes present, usually curved, smaller and paler than the conidia.

Usually found on dead leaves of *Scirpus sylvaticus* but collections have been made also on *S. lacustris*, *Carex acutiformis* and *C. riparia*; specimens seen from Austria, Belgium, England, Finland, France, Germany, Latvia, Russia, Sweden, and Switzerland.

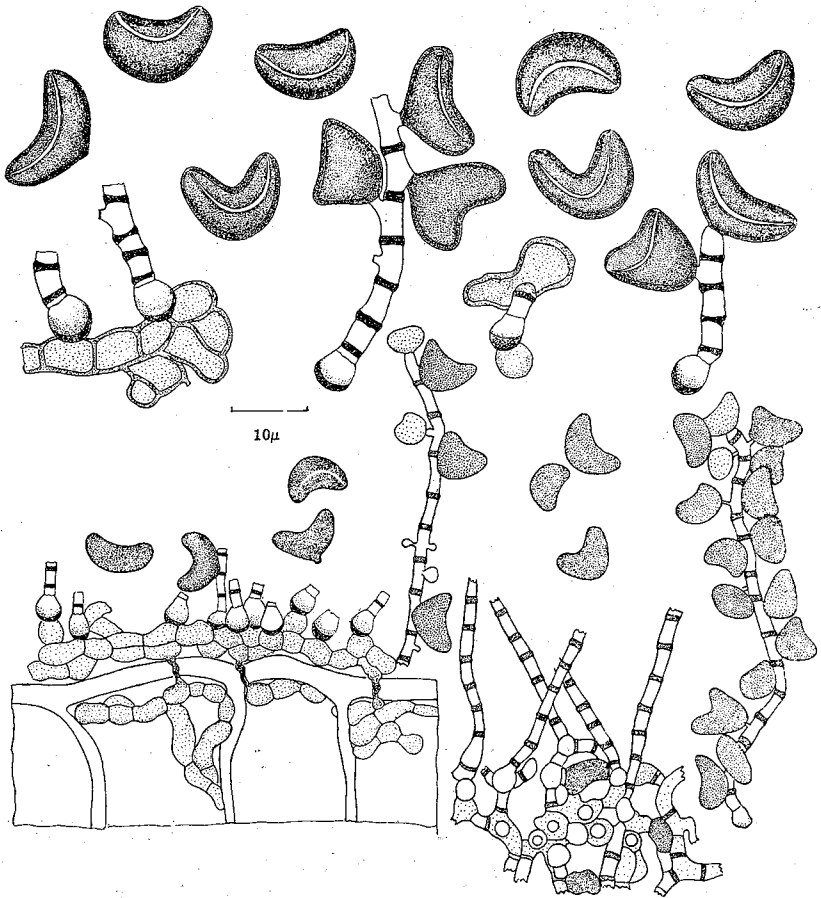


FIG. 13. *Arthrimum* state of *Pseudoguignardia scirpi*  
( $\times 650$  except where indicated by the scale).

#### SPECIMENS EXAMINED

*Herb. W. B. Grove, now in Herb. BM.*

On *Scirpus sylvaticus*, Whichford Wood, iii.1891, as *Camptoum curvatum*.

*Camptoum curvatum* folder in *Herb. K.*

On *Carex acutiformis*, Collabrigo, iii.1879, C. Spegazzini's Dec. Myc. Ital., 28, as *Arthrimum curvatum*. On *Scirpus lacustris*, environs de Courtrai et d'Ypres, ii, Herb. Hort. Bot. Belg., 974. On *Scirpus sylvaticus*, Bodenbach, 1873, Thümen's Fungi austriaci, 1168; Libert's Pl. Crypt. Arduennae, Fasc. 1 (1830), 79; Rudloe, Wilts., England, C. E. Broome, Herb. Berk. 1879; Bukulti bei Riga, Latvia, iv.1927, F. Smarods; Limoges, iii.1844, J. Gay's Flora Galliae et Germaniae, 987; Berlin, Zopf & Sydow's Mycotheca marchica, 95, as *A. curvatum*; Brandenburg, v.1917, Sydow's Mycotheca germanica, 1746; Neuchatel, Switzerland, iii.1880, Morthier, C. Roumeguère's Fungi gallici, 199.

*Pseudoguignardia scirpi* folder in *Herb. IMI.*

All exsiccata published as *Arthrimum curvatum* or *Camptoum curvatum* and on *Scirpus sylvaticus*: Austria, near Rosenau, iv, Mus. Palat. Vindobon. Krypt., 1627 (11832); Finland, Alandia, Eckero, Storby, iv.1937, Lehtola & Roivainen, Mycotheca fennica, fasc. 17, 818 (60832); Nylandia, Korso, Lehtola & Roivainen, iv.1936, Mycotheca fennica, fasc. 17, 819

(60833); Germany, near Leipzig, ix.1894, Rabenhorst-Winter-Paszschke's *Fungi europaei*, 4089 (16328); Lettland, iv.1935, K. Starcs, F. Petrak's *Mycotheca generalis*, 212 (30112); Russia, Lesnoi near Petropolin, iv.1894, Jaczewski, Komarov and Tranzschel's *Fungi Rossiae*, 100 (16326); Gastrikland, iv.1954, J. A. Nannfeldt, *Fungi suecici*, 2677 (106244).

(14) *Arthrinium morthieri* Fuckel, 1870, *Symb. mycol.*, p. 357.

Colonies compact, pulvinate, round or oval, usually  $150\text{--}200 \times 150\text{--}400\mu$ , dark blackish brown. *Mycelium* partly superficial, partly immersed in the

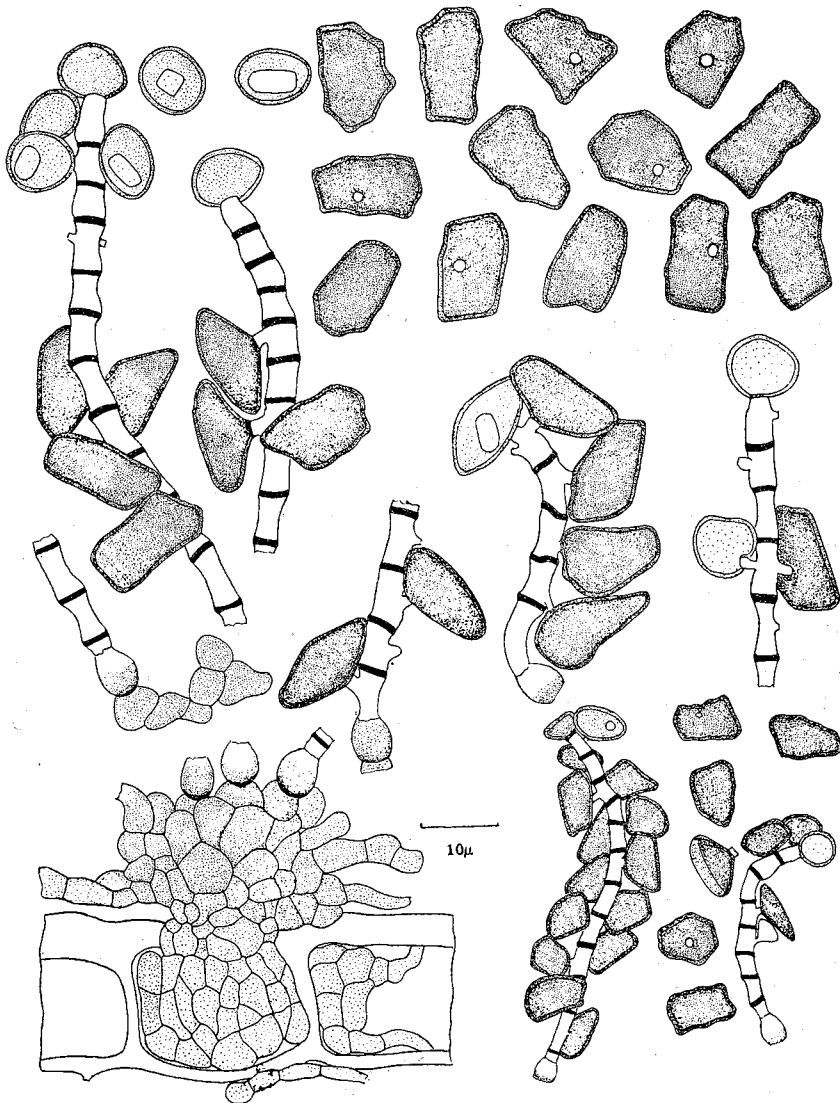


FIG. 14. *Arthrinium morthieri* ( $\times 650$  except where indicated by the scale).

substratum, composed of branched and anastomosing, septate, pale to mid olivaceous brown, smooth-walled, 1.5–6 $\mu$  thick hyphae. *Conidiophore mother cells* subspherical or barrel-shaped, 5–6.5  $\times$  4.5–5 $\mu$ . *Conidiophores* erect or ascending, simple, straight or flexuous, cylindrical, colourless except for the thick, brown to dark brown, transverse septa, smooth-walled, 30–75 $\mu$  long, 2–4.5 $\mu$  thick. *Conidia* somewhat flattened, oblong or irregular in face view, often triangular in side view, rather pale brown, smooth-walled, 12–16 (14.7)  $\times$  7–9 (8.3) $\mu$  in face view, 4–8 $\mu$  thick. *Sterile cells* spherical to ellipsoidal, very pale, 7–10  $\times$  5–8 $\mu$ .

On leaves of *Carex* spp., including *C. digitata*, *C. panicea* and *C. sempervirens* specimens seen from Sweden and Switzerland.

#### SPECIMENS EXAMINED

*Arthrinium morthieri* folder in *Herb. G.*

On *Carex digitata*, Dombresson, Jura, Switzerland, spring, Cl. Morthier, Fuckel's Fungi rhenani, 1914, type.

*A. morthieri* folder in *Herb. IMI.*

On *Carex panicea*, Bohuslän, Fiskebäckspil, vii.1960, S. Nilsson (92548). On *C. sempervirens*, Tessin, Nante, Switzerland, iv.1944, A. Volkart (96384).

(15) *Arthrinium caricicola* Kunze ex Ficinus & Schubert, 1823; Kunze, 1817, in Kunze & Schmidt's *Mykologische Hefte*, 1, p. 9; Ficinus & Schubert, 1823, *Kryptogamie in H. D. A. Ficinus' Flora der Gegend um Dresden*, p. 276; Fries, 1832, *Systema Mycol.*, 3, p. 376.

*A. naviculare* Rostrup, 1886, *Bot. Tidsskr.*, 15, p. 235.

*Colonies* compact, pulvinate, round, 150–400 $\mu$  in diameter, dark blackish brown. *Mycelium* partly superficial, partly immersed in the substratum; superficial part composed of a network of branched and anastomosing, septate, brown to dark brown, smooth-walled, 2.5–6 $\mu$  thick hyphae; immersed hyphae pale to dark brown, 1–8 $\mu$  thick. *Conidiophore mother cells* subspherical to lageniform, 5–8  $\times$  5–7 $\mu$ . *Conidiophores* erect or ascending, simple, flexuous, cylindrical, colourless except for the thick, brown or dark brown, transverse septa, smooth-walled, 20–106 $\mu$  long, 2–4.5 $\mu$  thick. *Conidia* fusiform or cigar-shaped in face view, navicular in side view, part usually dark brown, the rest much paler, with a distinct hyaline rim, 30–53 (43)  $\times$  7.5–13 (9.4) $\mu$ . *Sterile cells* much smaller and paler than conidia, bicuspid or irregularly lobed.

On various species of *Carex* including *C. ciliata*, *C. digitata*, *C. ericetorum*, *C. ligerica*, *C. panicea*, *C. praecox* and on *Eriophorum caespitosum*; specimens seen from Finland, Germany, Latvia, Russia, Sweden, and Switzerland.



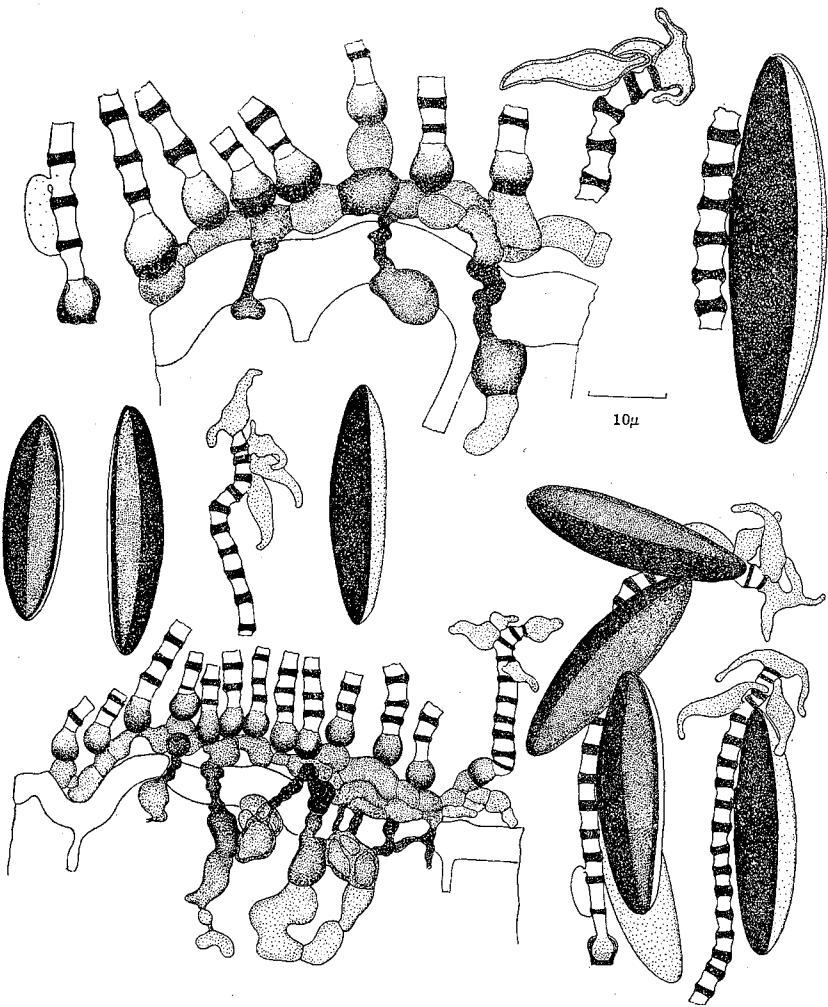


FIG. 15. *Arthrimum caricicola* ( $\times 650$  except where indicated by the scale).

#### SPECIMENS EXAMINED

*Arthrimum caricicola* folder in Herb. STR.

*Arthrimum caricicola* [scripsit Kunze] on leaves of *Carex ciliata*, Berlin, iv, type.

*A. caricicola* folder in Herb. K.

On *C. ciliata*, Klotzsch, 71. On *C. digitata*, Mustiala, Finland, Karsten's Fungi fennici, 382. On *C. ericetorum*, Budenheim, Fuckel's Fungi rhenani, 125; Aclaz, Latvia, iv.1929, J. Smarods, 1349. On *C. praecox*, Brandenburg, Zopf & Sydow's Mycotheca marchica, 94.

*A. naviculare* folder in Herb. K.

On *C. ligerica*, Mostez, Jaroslavl, v.1902, Tranzschel & Serebrianikow's Mycotheca rossica, 99.

*A. caricicola* folder in Herb. IMI.

On *C. ericetorum*, Gottland: Vastkinde, vi.1920, T. Vestergren, Flora suecica (16283); München: Grosshesseloh, iv.1895, Allescher & Schnabl's Fungi bavarici, 495 (16281); Brandenburg, iv.1916, Sydow's Mycotheca germanica, 1745 (19522); Lettland: Riga, v. 1943,

J. Smarods, F. Petrak's Mycotheca generalis, 1704 (32654). On *C. panicea*, Regio aboensis, Vihti, xi.1935, V. B. Lehtola, Mycotheca fennici, 817 (60831). On *Eriophorum caespitosum*, Tessin, Nante, Switzerland, vi.1945, A. Volkart (99596).

(16) *Arthrimum sporophleum* Kunze, 1823, in Kunze & Schmidt's Mykologische Hefte, 2, p. 104; Fries, 1832, Systema Mycol., 3, p. 377.

*Sporophleum gramineum* Nees, 1824, apud Link in Linné, Species Plantarum, ed. 4 (Willdenow's), 6, 1, p. 45.

*Torula eriophori* Berkeley, 1836, Fungi in J. E. Smith's English Flora, 5 (2), p. 359.

*Arthrimum sporophleoides* Fuckel, 1873, Symb. mycol., Nachtr., 2, p. 78.

Colonies compact, pulvinate, oval, 300–1000 × 200–600 $\mu$ , dark blackish brown. Mycelium partly superficial, partly immersed in the substratum; superficial part composed of a network of branched and anastomosing, septate, colourless to brown, smooth-walled, 3–9 $\mu$  thick hyphae; immersed hyphae colourless to pale brown, 1.5–4 $\mu$  thick. Conidiophore mother cells subspherical to lageniform, 4.5–6 × 4.5–5.5 $\mu$ . Conidiophores erect or ascending, flexuous, cylindrical, colourless except for the thick, brown or dark brown, transverse septa, smooth-walled, 40–150 $\mu$  long, 2–4.5 $\mu$  thick. Conidia brown, often with a pale rim, limoniform to elliptical in face view and 11–15 (12.3) × 5–7.5 (5.9) $\mu$ , often almost triangular in side view but with the outer edge curved and the corners rounded; 5–7 $\mu$  thick. Sterile cells pale brown, subspherical, polygonal or triangular, 5–8 $\mu$  wide, or irregularly lobed.

On various species of *Carex*, including *C. acuta*, *C. acutiformis*, *C. flava*, *C. hirta*, *C. montana*, *C. paniculata*, *C. riparia* and *C. supina*, *Eriophorum angustifolium*, *E. comosum*, *Juncus effusus* and *Typha angustifolia*; specimens seen from France, Germany, Great Britain, India, and Portugal.

#### SPECIMENS EXAMINED

*Arthrimum caricicola* folder in Herb. K.

On *Carex*, Dresden, Hantzsch, Rabenhorst's Fungi europaei, 76.

*A. sporophleoides* folder in Herb. G.

On *C. supina* and *C. montana*, Budenheim, spring, Fuckel's Fungi rhenani, 2588.

*A. sporophleum* folder in Herb. K.

On *C. acuta*, Brandenburg, ix.1935, Sydow's Mycotheca germanica, 3200. On *C. sp.*, Forêt de Fontainebleau, ii.1883, C. Roumeguère's Fungi gallici, 254a. On *Juncus effusus*, Coimbra, Portugal, iii.1883, A. Moller, Rabenhorst-Winter's Fungi europaei, 3180.

*Gonatosporium puccinioides* folder in Herb. K.

On *Carex*, Desmazière's Crypt. France, Ser. 1, 602, as *A. puccinioides*. On *Eriophorum angustifolium*, King's Cliffe, type of *Torula eriophori*.

*Sporophleum gramineum* folder in Herb. STR.

Specimen labelled *Sporophleum gramineum* [scripsit Nees].

*A. sporophleum* folder in Herb. IMI.

On *Carex*, Meaux, France, 1893, Briosi & Cavara's Funghi parassiti 242. One collection from India on *Eriophorum comosum*, and 43 British collections made in Lancs., Norfolk and Yorks. on species of *Carex* including *C. acutiformis*, *C. flava*, *C. hirta*, *C. paniculata* and *C. riparia* and on *Typha angustifolia* (476, 530, 19591–19601, 19605–19618, 20967, 27787, 27815–16, 34277, 34522, 34620a, 34861a, 34891, 34892a, 58075, 69058, 69076, 72276, 85742, 100276, 102893).

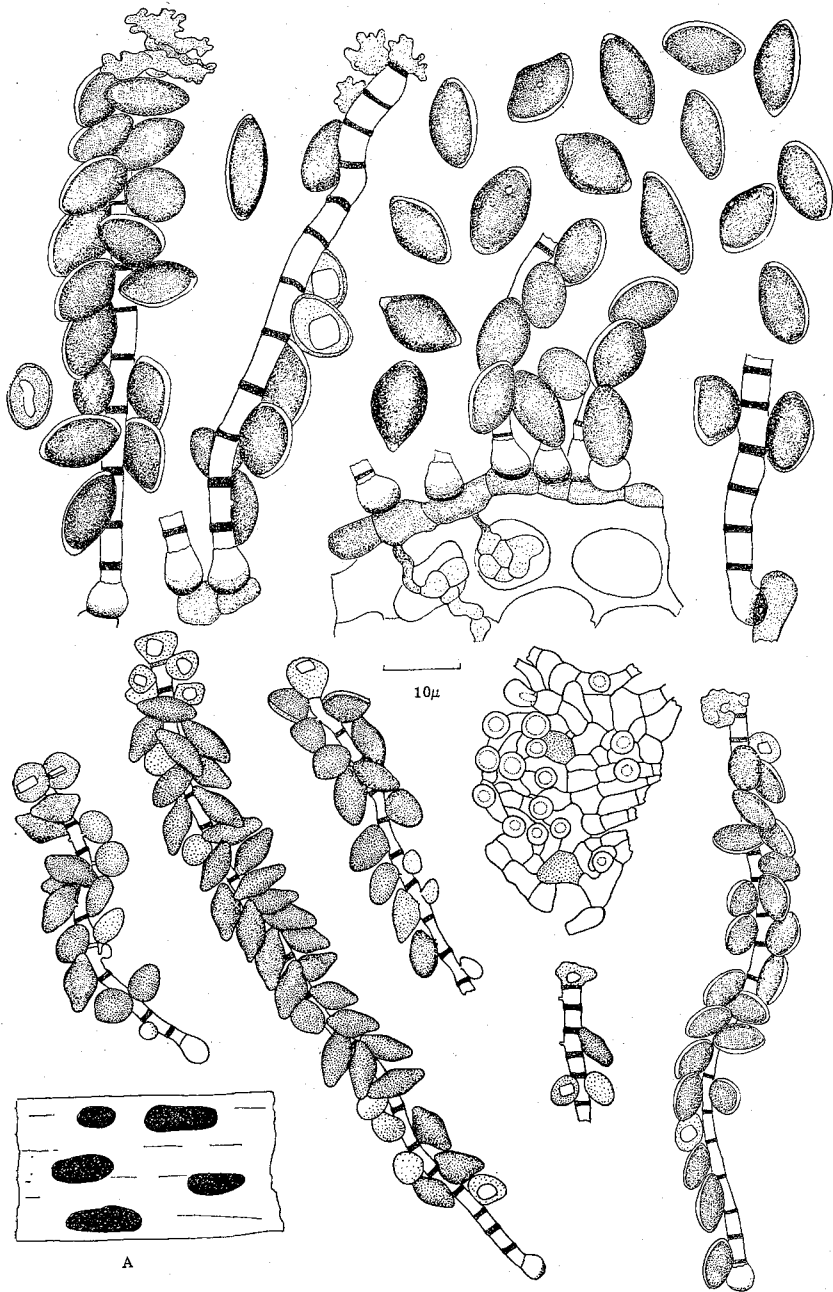


FIG. 16. *Arthrimum sporophleum*  
 (A, habit sketch; other figs.  $\times 650$  except where indicated by the scale).

(17) *Arthrinium lobatum* M. B. Ellis, 1963, *Mycol. Pap.*, **87**, p. 21.

*Colonies* compact, pulvinate, round to oval, dark blackish brown to black. *Mycelium* partly superficial, partly immersed in the substratum; superficial part composed of a network of branched and anastomosing, septate, subhyaline to pale olivaceous brown, smooth-walled, 3–9 $\mu$  thick hyphae; immersed hyphae hyaline, 2–8 $\mu$  thick. *Conidiophore mother cells* lageniform, 7–14  $\times$  7–9 $\mu$ . *Conidiophores* erect or ascending, simple, straight or flexuous, cylindrical,

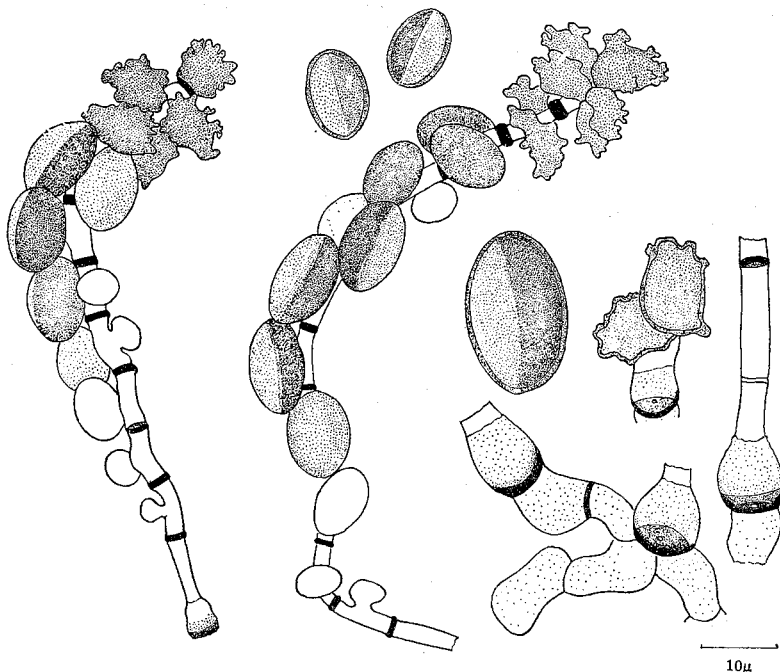


FIG. 17. *Arthrinium lobatum* ( $\times$  650 except where indicated by the scale).

colourless except for the thick, dark brown, transverse septa, smooth-walled, 20–200 $\mu$  long, 3–5 $\mu$  thick. *Conidia* oval or broadly ellipsoidal, part usually brown or dark brown, the rest much paler, smooth-walled, 17–20 (19.5)  $\times$  12–14 (12.4) $\mu$ . *Sterile cells* irregularly angled and lobed, 9–18 $\mu$  across.

On dead grass leaves, Venezuela (74782).

(18) *Arthrinium ushuvaiense* Spegazzini, 1887, *Boln Acad. nac. Cienc.*, *Cordoba*, **11**, p. 304.

*Colonies* compact, pulvinate, round or oval, dark blackish brown to black. *Mycelium* partly superficial, partly immersed in the substratum; superficial part composed of a network of branched and anastomosing, septate, pale to

mid-brown, smooth-walled, 2–6 $\mu$  thick hyphae; immersed hyphae pale brown to brown, 1–3 $\mu$  thick. *Conidiophore mother cells* subspherical to lageniform, 4.5–7.5  $\times$  4.5–6 $\mu$ . *Conidiophores* erect or ascending, straight or flexuous,

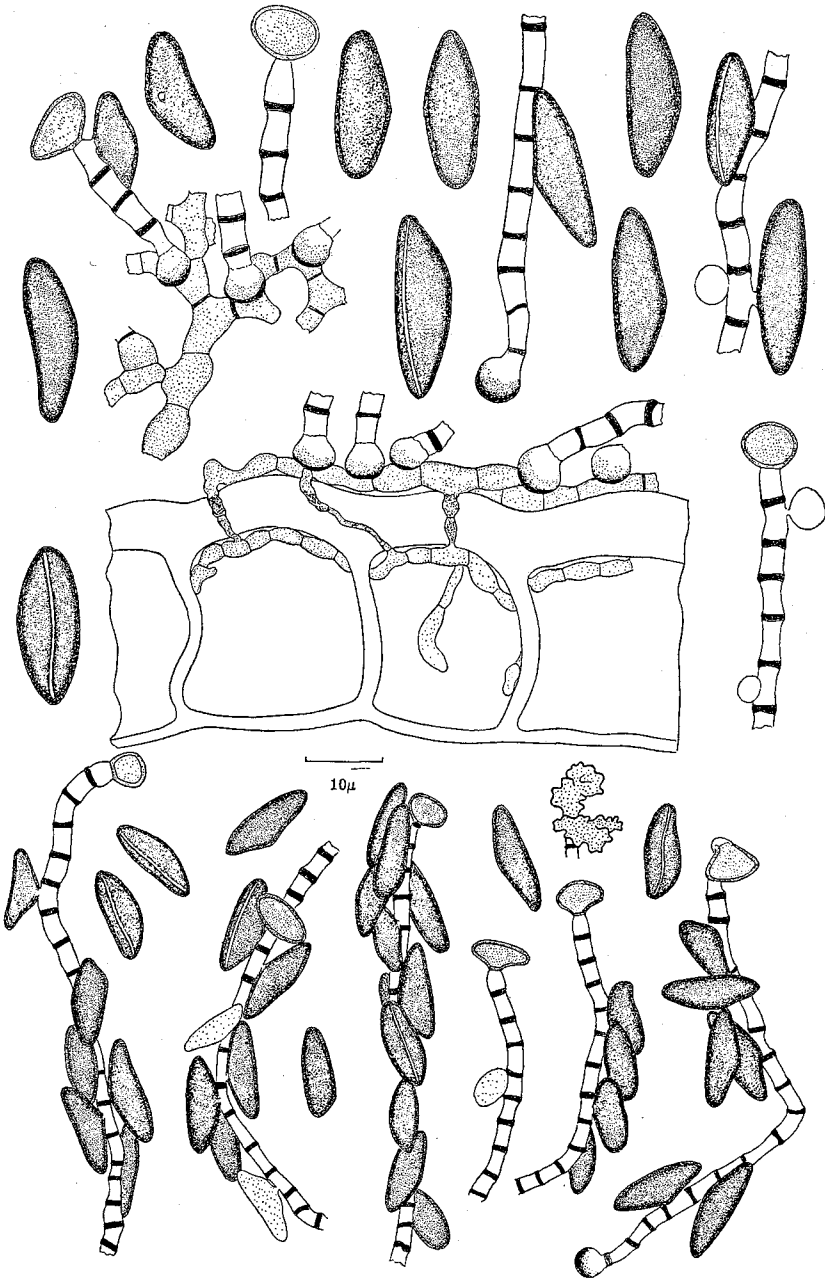


FIG. 18. *Arthrinium ushuvaiense* ( $\times$  650 except where indicated by the scale).

cylindrical, colourless except for the thick, brown or dark brown, transverse septa, smooth-walled, 20–140 $\mu$  long, 2–4 $\mu$  thick. *Conidia* brown or dark brown, often with a pale rim, limoniform, fusiform or navicular in face view, and 17–25 (21)  $\times$  6–9 (7.2) $\mu$ , often somewhat triangular in side view but with the outer edge curved and the corners rounded, 6–8 $\mu$  thick. *Sterile cells* pale brown, subspherical or triangular, 7–11 $\mu$  diam. or irregularly lobed.

On *Luzula antarctica*, Ushuvaia, Tierra del Fuego, v.1882, C. Spegazzini, 12702, type in Herb. LPS; on dead grass, Argentina, R. W. G. Dennis (75583).

## CORDELLA

### *Cordella* Spegazzini

#### GENERIC DESCRIPTION

*Colonies* compact or effused, dark blackish brown or black, each made up of a close carpet of setae mixed with small groups of conidiophores. *Mycelium* partly superficial, partly immersed in the substratum. *Setae* subulate, brown or black. *Conidiophore mother cells* ampulliform or barrel-shaped, arising from cells of the superficial mycelial mat. *Conidiophores* arising singly from conidiophore mother cells, simple, rather narrow, more or less cylindrical, colourless or pale brown except for the thick, brown or dark brown, transverse septa; growth in length takes place only at the base. *Conidia* terminal and lateral, usually formed on very short pegs, 1-celled, lenticular, pale brown to brown with a hyaline band at the junction of the two sides. *Lectotype species*: *Cordella coniosporioides* Speg.

*Cordella coniosporioides* Spegazzini, 1886, *An. Soc. cient. argent.*, **22**, p. 210.

*Colonies* compact, pulvinate, oval or linear, black, shining. *Mycelium* partly superficial, partly immersed in the substratum; superficial part composed of a close network of branched and anastomosing, septate, olive brown, smooth-walled, 2–7 $\mu$  thick hyphae often in two or more layers; immersed hyphae subhyaline to rather pale olive brown, 1.5–4 $\mu$  thick. *Setae* erect, curved or flexuous, subulate, often bulbous at the base, brown or dark brown, smooth-walled, 0-septate, 15–40 $\mu$  long, 3–6 $\mu$  thick in the broadest part, tapering to 0.5–1.5 $\mu$  near the apex. *Conidiophore mother cells* ampulliform, subhyaline to pale brown, sometimes verruculose, 5–8  $\times$  4.5–6 $\mu$ . *Conidiophores* erect or ascending, simple, flexuous, cylindrical, colourless to pale brown, often verruculose, with brown or dark brown transverse septa, 15–25 $\mu$  long, 2.5–4 $\mu$  thick. *Conidia* lenticular, pale brown to brown with a hyaline band at the junction of the two sides, 17–21 (19) $\mu$  broad, 8–10 (9.7) $\mu$  thick.

On bamboo culms, Paraguay and Venezuela. Part of the co-type, Balansa No. 2804 in Herb. PC, has been examined and one fresh collection from Venezuela, IMI 74789.

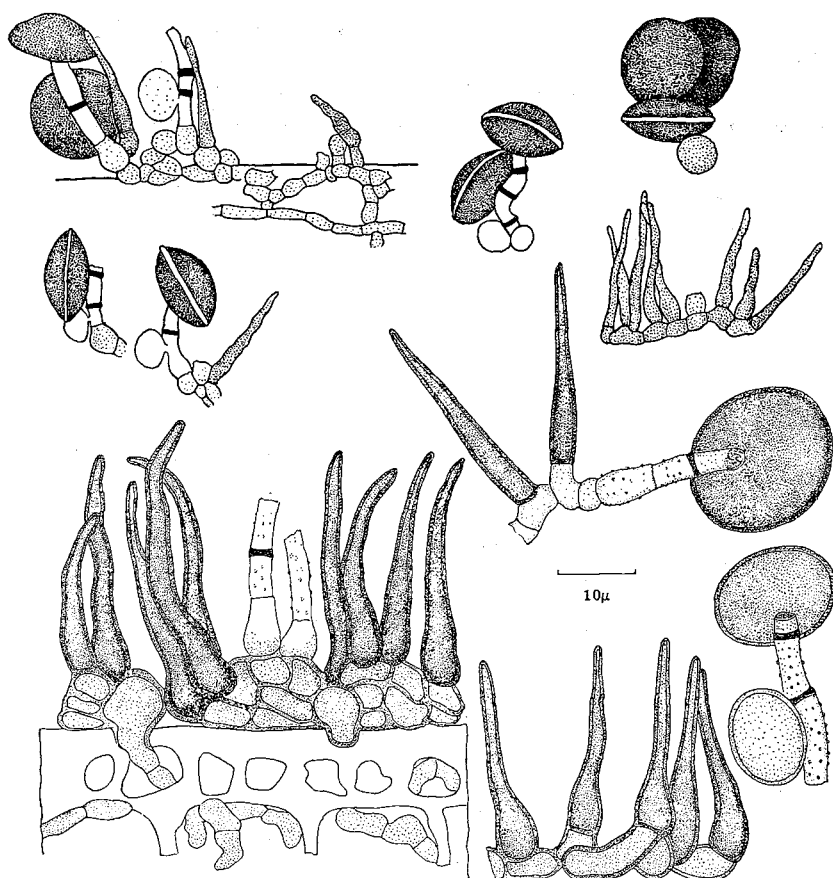


FIG. 19. *Cordella coniosporioides* ( $\times 650$  except where indicated by the scale).

***Cordella johnstonii* M. B. Ellis spec. nov.**

*Coloniae* effusae, fuscae vel atrae, pilosae. *Mycelium* partim superficiale et partim in substrato immersum. *Mycelium superficiale* ex hyphis ramosis et anastomosantibus, septatis, pallide brunneis vel brunneis, levibus, 2–5 $\mu$  crassis, reticulatis compositum. *Mycelium immersum* ex hyphis hyalinis vel pallide brunneis, 1.5–4 $\mu$  crassis compositum. *Setae* erectae, rectae vel flexuosae, subulatae, fuscae vel atrae, leves, septatae, 200–350 $\mu$  longae, basim versus 8–15 $\mu$  crassae. *Conidiophora* ex cellis ampulliformibus vel doliiformibus oriunda, erecta vel ascendente, simplicia, flexuosa, cylindrica, hyalina vel pallide brunnea, levia vel verruculosa, 15–50 $\mu$  longa, 1.5–3 $\mu$  crassa, septis transversalibus, crassis, brunneis vel atrobrunneis praedita. *Conidia* lenticularia, pallide brunnea vel brunnea, 19–22 (20.4) $\mu$  lata, 10–12 (11.3) $\mu$  crassa. Habitat in culmis emortuis *Bambusae blumeanae*, Federal Experiment Station, Serdang, Malaya, A. Johnston, 16. ii.1956, IMI 62498 typus.

*Colonies* effused, dark blackish brown to black, hairy. *Mycelium* partly

superficial, partly immersed in the substratum; superficial part composed of a close network of branched and anastomosing, septate, pale brown to brown, smooth-walled, 2–5 $\mu$  thick hyphae arranged in one layer or sometimes two or more layers; immersed hyphae hyaline to pale brown, 1.5–4 $\mu$  thick. *Setae*

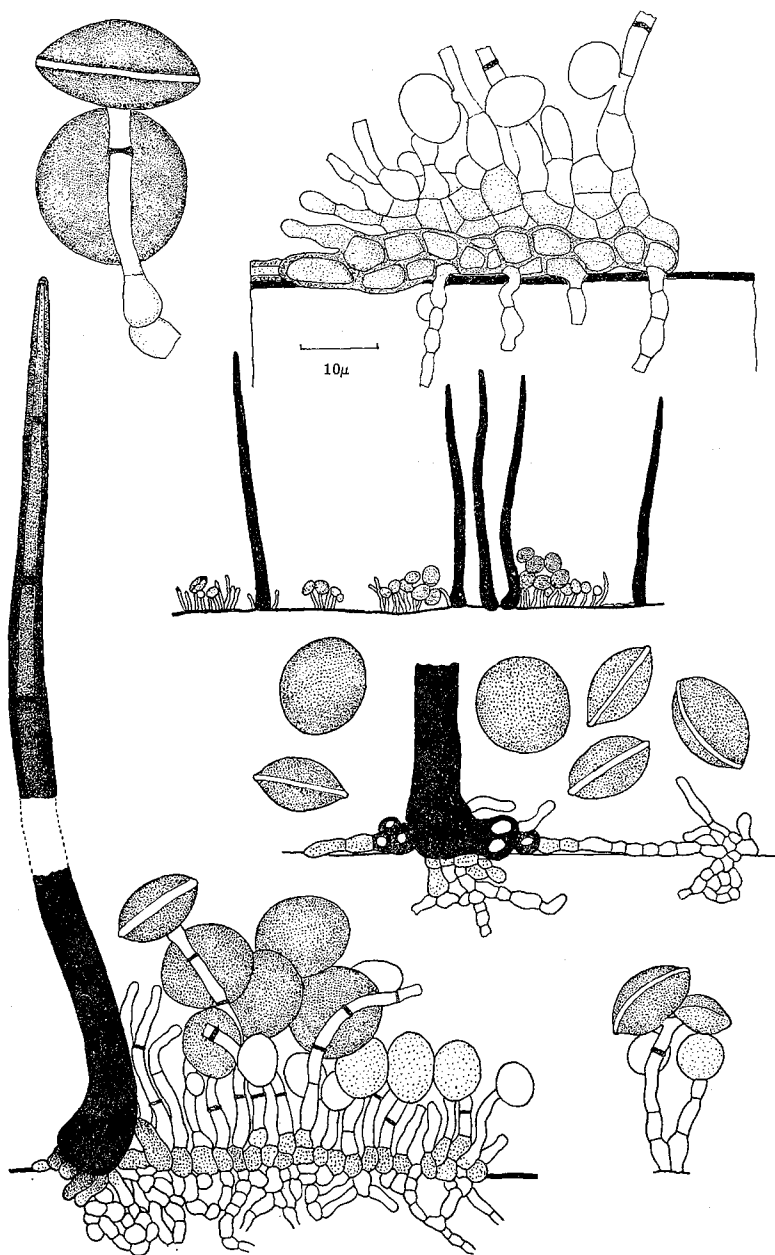


FIG. 20. *Cordella johnstonii* ( $\times 650$ , except where indicated by the scale).



erect, straight or flexuous, subulate, acutely pointed at the apex, dark blackish brown to black, smooth-walled, septate, 200–350 $\mu$  long, 8–15 $\mu$  thick in the broadest part. *Conidiophore mother cells* ampulliform or barrel-shaped, colourless to pale brown, 4–8  $\times$  3–5 $\mu$ . *Conidiophores* erect or ascending, simple, flexuous, cylindrical, colourless to pale brown, smooth or verruculose, with thick, brown or dark brown, transverse septa, 15–50 $\mu$  long, 1.5–3 $\mu$  thick. *Conidia* lenticular, pale brown to brown with a hyaline band at the junction of the two parts, 19–22 (20.4) $\mu$  broad, 10–12 (11.3) $\mu$  thick.

On dead culms of *Bambusa blumeana*, Malaya.

### ACRODICTYS

*Acrodictys appendiculata* M. B. Ellis spec. nov.

*Coloniae* effusae, griseae vel atrae. *Mycelium* superficiale, ex hyphis ramosis, septatis, pallide brunneis vel brunneis, levibus, 2–5 $\mu$  crassis, reticulatis compositum. *Conidiophora* singula vel 2–3 fasciculata ex lateribus hypharum oriunda, erecta, recta vel flexuosa, atro-brunnea vel fusca, levia, continua, 6–32 $\mu$  longa, 4–6 $\mu$  crassa. *Conidia* singula in apice conidiophori oriunda, urbinata vel subglobosa, muriformia, levia, brunnea vel atro-brunnea, 24–44 (33) $\mu$  longa, 20–32 (26) $\mu$  crassa, appendicibus 2–4, pallide brunneis, 15–56 $\mu$  longis, 3–4 $\mu$  crassis ornata; cella basilari obconica, basi truncata, 3.5–4 $\mu$  lata. *Habitat* in culmis emortuis *Oxytenantherae abyssinicae*, inter Musaia et Okentu, Sierra Leone, P. W. Sellar, 10. viii.1963, IMI 103347 d typus.

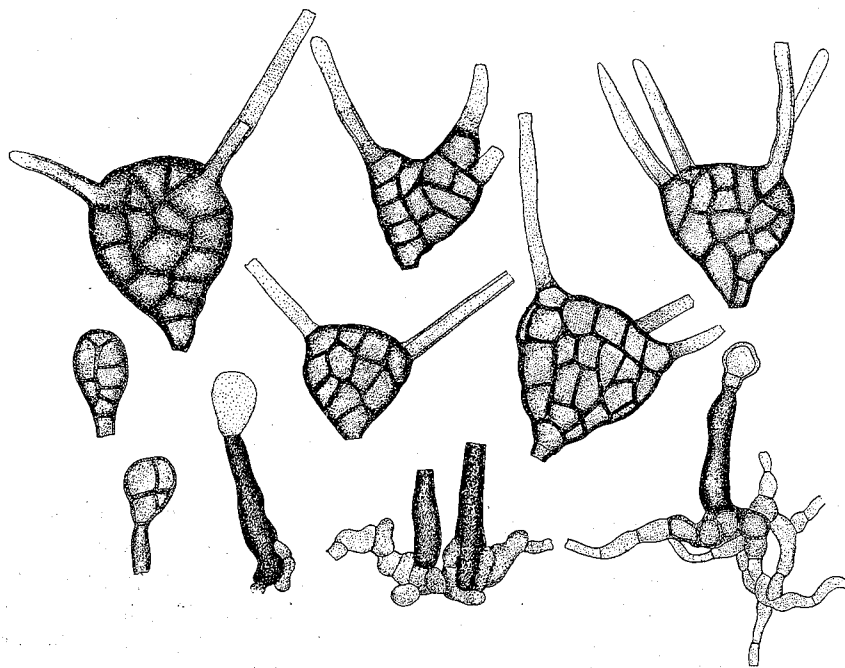


FIG. 21. *Acrodictys appendiculata* ( $\times$  650).

*Colonies* effused, grey to black. *Mycelium* superficial, composed of a network of branched, septate, pale brown to brown, smooth-walled, 2–5 $\mu$  thick hyphae. *Conidiophores* arising singly or in groups of 2–3 laterally on the hyphae, erect, straight or flexuous, dark brown to dark blackish brown, smooth-walled, non-septate, 16–32 $\mu$  long, 4–6 $\mu$  thick. *Conidia* formed singly as a blown-out end at the apex of each conidiophore, turbinate to subglobose, muriform, smooth-walled, brown to dark brown, 24–44 (33) $\mu$  long, 20–32 (26) $\mu$  thick, with 2–4 pale brown appendages 15–56 $\mu$  long, 3–4 $\mu$  thick; basal cell obconical, truncate and 3.5–4 $\mu$  wide at the base.

On dead culms of *Oxytenanthera abyssinica*, Sierra Leone.

***Acrodictys globulosa* (Tóth) M. B. Ellis comb. nov.**

*Monodictys globulosa* Tóth, 1962, *Ann. hist.-nat. Mus. hung.*, **54**, p. 183.

*Colonies* effused, brown. *Mycelium* partly superficial, partly subcuticular, composed of branched, septate, pale brown to brown, smooth-walled, 1–4 $\mu$

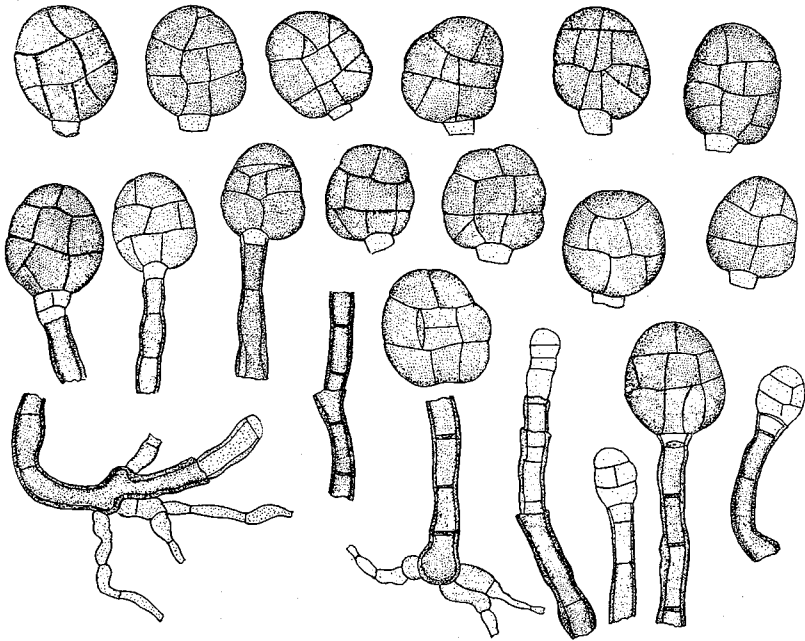


FIG. 22. *Acrodictys globulosa* ( $\times 650$ ).

thick hyphae. *Conidiophores* arising singly or in groups of 2–3 laterally on the hyphae, erect or ascending, straight or flexuous, brown to dark brown near the base, pale brown above, smooth-walled, septate, 30–70 $\mu$  long, 5–7 $\mu$  thick, often with 1–6 successive, cylindrical terminal proliferations. *Conidia* formed singly as blown-out ends at the apex of the conidiophore, which after the first conidium has fallen often proliferates straight on and forms another

conidium at a higher level, subglobose, pale brown to brown, smooth-walled, usually with 2 transverse septa and several longitudinal and oblique septa, 22–27 (25) $\mu$  long, 17–23 (20) $\mu$  thick; basal cell almost cylindrical, protruding, very pale brown, 5–6 $\mu$  wide.

On dead stems of *Clematis vitalba*, near Dédesvár mountain Bükk hegység, Hungary, S. Tóth, 16, viii.1960, type in Herb. BP, No. 3424, slide IMI 101012. Also on bark of a tree, Gberia, Fotombu, Sierra Leone, P.W. Sellar, 19. viii. 1963, IMI 103373c.

### ANNELLOPHORA

*Annellophora borneoensis* M. B. Ellis spec. nov.

*Coloniae* epiphyllae, effusae, griseae vel atrae, pilosae. *Mycelium* partim superficiale et partim immersum, ex hyphis ramosis, septatis, subhyalinis vel pallide brunneis, levibus, 1–3 $\mu$  crassis compositum. *Conidiophora* singula vel 2–3 fasciculata ex apice lateribusque hypharum oriunda, erecta, recta vel flexuosa, cylindrica, basi inflata, brunnea vel atro-brunnea, levia, septata, per usque ad 12 proliferationes cylindricas successivas elongascentia, 80–260 $\mu$  longa, 3–5 $\mu$  crassa. *Conidia* singula, primo in apice conidiophori et dein proliferationis cujusque successivae oriunda, recta vel leviter flexuosa, obclavata

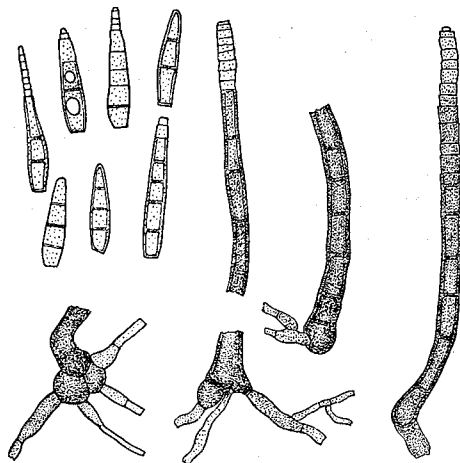


FIG. 23. *Annellophora borneoensis* ( $\times$  650).

vel subfusiformia, ad basim truncata, levia, subhyalina vel pallide brunnea, 1–4 septata, 18–28 (21.5) $\mu$  longa, 4–4.5 $\mu$  crassa, apicem versus ad 1.5–2 $\mu$  attenuata, basi 3 $\mu$  lata, saepe apice per usque ad 7 proliferationes successivas elongascentia; conidiis secundariis minoribus in apice proliferationum successivarum oriundis. *Habitat* in foliis *Theobromae cacao*, Tiger Estate, North Borneo, A. Johnston, 7. ix.1959, IMI 78866 typus.

*Colonies* epiphyllous, effused, grey to black, hairy. *Mycelium* partly superficial partly immersed in the substratum, composed of branched, septate, subhyaline

to pale brown, smooth-walled, 1–3 $\mu$  thick hyphae. *Conidiophores* arising singly or in groups of 2–3, terminally and laterally on the hyphae, erect, straight or flexuous, cylindrical, swollen at the base, brown to dark brown, smooth-walled, septate, with up to 12 successive cylindrical proliferations, 80–260 $\mu$  long, 3–5 $\mu$  thick. *Conidia* formed singly at the apex of the conidiophore which after the first conidium has fallen grows straight on and forms another conidium at the apex of the proliferation, straight or slightly flexuous, obclavate to subfusiform, truncate at the base, smooth-walled, subhyaline to pale brown, 1–4 septate, 18–28 (21.5) $\mu$  long, 4–4.5 $\mu$  thick in the broadest part, tapering to 1.5–2 $\mu$  near the apex, 3 $\mu$  wide at the base, often with up to 7 successive terminal proliferations on which rather smaller secondary conidia are borne in turn.

On leaves of *Theobroma cacao*, North Borneo.

***Annelophora dendrographii* M. B. Ellis spec. nov.**

*Coloniae* hyperparasiticae, effusae, fuscae, pilosae. *Mycelium* superficiale, ex hyphis ramosis, septatis, subhyalinis vel pallide brunneis, levibus, 1–3 $\mu$  crassis compositum. *Conidiophora* singula vel 2–3 fasciculata ex apice lateribusque hypharum oriunda, recta vel flexuosa, cylindrica, basi interdum inflata, brunnea vel atro-brunnea, apicem versus pallidiora, levia, septata, per usque ad 11 proliferationes cylindricas successivas elongascentia, 16–30 $\mu$  longa, 4–5 $\mu$  crassa. *Conidia* singula, primo in apice conidiophori et dein proliferationis cujusque successivae oriunda, recta vel flexuosa, obclavata, ad basim truncata, levia, subhyalina vel pallide brunnea, 5–9 septata, 30–62 (47) $\mu$  longa, 8–9 (8.2) $\mu$  crassa, apicem versus ad 2–3 $\mu$  attenuata, basi 4–5 $\mu$  lata, saepe apice per usque ad 5 proliferationes successivas elongascentia; conidiis secundariis minoribus in apice proliferationum successivarum oriundis. *Habitat* in conidiophoris *Dendrographii atri* in ramis emortuis arboris ignotae, Guarapi, Paraguay, B. Balansa No. 2796 in Herb. K ut *Cordella spinulosa*, slide IMI 99940 b typus.

*Colonies* hyperparasitic, effused, dark blackish brown, hairy. *Mycelium* superficial, composed of branched, septate, subhyaline to pale brown, smooth-walled,

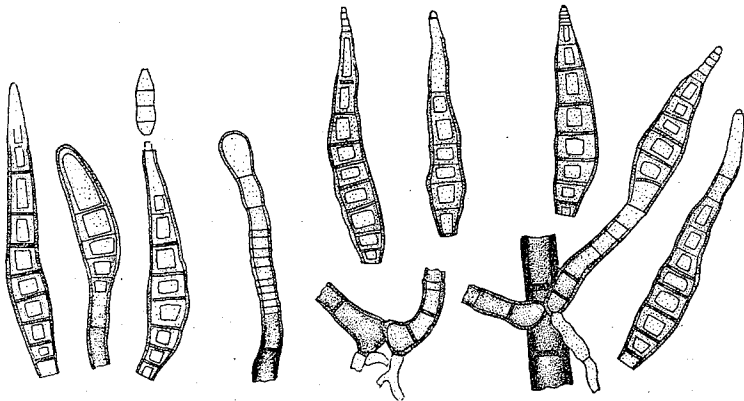


FIG. 24. *Annelophora dendrographii* ( $\times 650$ ).

1–3 $\mu$  thick hyphae. *Conidiophores* arising singly or in groups of 2–3 terminally and laterally on the hyphae, straight or flexuous, cylindrical, sometimes swollen at the base, brown to dark brown, paler towards the apex, smooth-walled, septate, with up to 11 successive cylindrical proliferations, 16–30 $\mu$  long, 4–5 $\mu$  thick. *Conidia* formed singly at the apex of the conidiophore which after the first conidium has fallen grows straight on and forms another conidium at the apex of the proliferation, straight or flexuous, obclavate, truncate, at the base, smooth, subhyaline to pale brown, 5–9 septate, 3–62 (47) $\mu$  long, 8–9 (8.2) $\mu$  thick in the broadest part, tapering to 2–3 $\mu$  near the apex, 4–5 $\mu$  wide at the base, often with up to 5 successive terminal proliferations on which smaller secondary conidia are borne in turn.

On conidiophores of *Dendrographium atrum* on dead branches of an unknown tree, Paraguay.

### BACTRODESMIUM

*Bactrodesmium microleucurum* (Speg.) M. B. Ellis comb. nov.

*Coniosporium microleucurum* Spegazzini, 1921, *Bol. Acad. Cienc. Córdoba*, 25, p. 112.

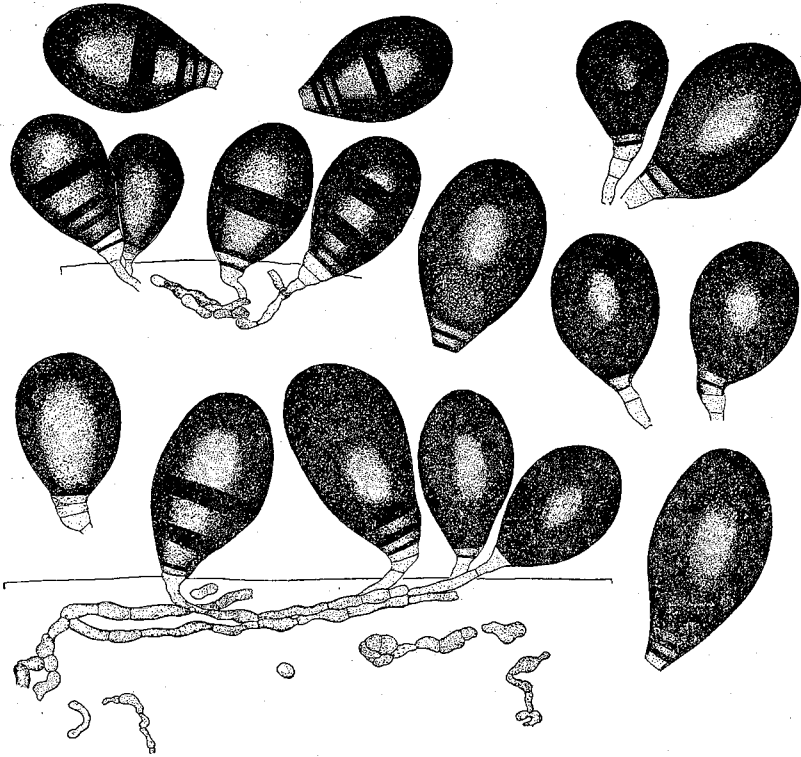


FIG. 25. *Bactrodesmium microleucurum* ( $\times 650$ ).

*Colonies* effused, black, granular. *Mycelium* immersed in the substratum, composed of branched, septate, reddish brown, smooth-walled, 1–3 $\mu$  thick hyphae. *Conidiophores* fasciculate, formed at the ends of the hyphae where these push through to the surface of the substratum, unbranched or occasionally branched, flexuous, subhyaline to pale brown, smooth-walled, septate, up to 30 $\mu$  long, 2–3 $\mu$  thick at the base, broadening towards the apex to 4–5 $\mu$ . *Conidia* formed singly as blown-out ends at the apices of conidiophores and branches, obovoid, opaque, when mature dark blackish brown except near the base where the cells are subhyaline or pale brown, smooth-walled, 2–5 septate, the septa usually close together towards the base, 30–48 (40) $\mu$  long, 18–25 (23) $\mu$  thick in the broadest part, 4–5 $\mu$  wide at the truncate base.

On dry dead culms of *Chusquea cummingii*, Los Perales, Chile, C. Spegazzini No. 12920, spring 1917; type in Herb. LPS.

### CONOPLEA

*Conoplea elegantula* (Cooke) M. B. Ellis, comb. nov.

*Botrytis elegantula* Cooke, Sept. 1883, *Grevillea*, 12, No. 61, p. 27.

*Colonies* effused, cottony, dark brown. *Mycelium* immersed in the substratum, composed of subhyaline to rather pale brown, smooth-walled, 1–4 $\mu$  thick hyphae. *Stromata* erumpent through stomata, up to 40 $\mu$  in diameter, dark brown. *Conidiophores* arising from the stromata, dendroid; mononematous stipes erect or ascending, septate, brown or dark brown, paler towards the apex, up to 1200 $\mu$  long, lower part smooth, 7–8 $\mu$  thick, upper part echinulate, 4–5 $\mu$  thick, sometimes tapering to 2–3 $\mu$  at the apex; primary branches up to 8 in number, up to 400 $\mu$  long, 3–4 $\mu$  thick, upwardly curving, sometimes unilateral, pale brown, darker towards the base, echinulate, often bearing secondary and tertiary branches. The shorter branches and end cells of longer ones are sporogenous cells which each bear usually 1–4 conidia; scars inconspicuous or appearing as short, peg-like projections. *Conidia* formed as blown-out ends singly at the tip of each sporogenous cell and of successive new growing points which develop just to one side of the previous conidium, oval, pale brown, rather thin-walled, minutely echinulate, 5–6 (5.8) $\mu$   $\times$  3.5–4.5 (4) $\mu$ .

On conifer needles, S. Carol., Ravenel 2944. The substratum of the type collection in Herb. K is stated on the packet to be rotting grass but it is decaying conifer needles upon which the fungus was found.

### PITHOMYCES

*Pithomyces cynodontis* M. B. Ellis spec. nov.

*Coloniae* pulvinatae vel effusae, fuscae vel atrae. *Mycelium* superficiale ex hyphis ramosis, septatis, subhyalinis vel stramineis, levibus vel verrucosis, 2–4 $\mu$  crassis reticulatis compositum. *Conidiophora* singula ex apice lateribusque hypharum oriunda, simplicia, recta vel flexuosa, cylindrica, pallide straminea,

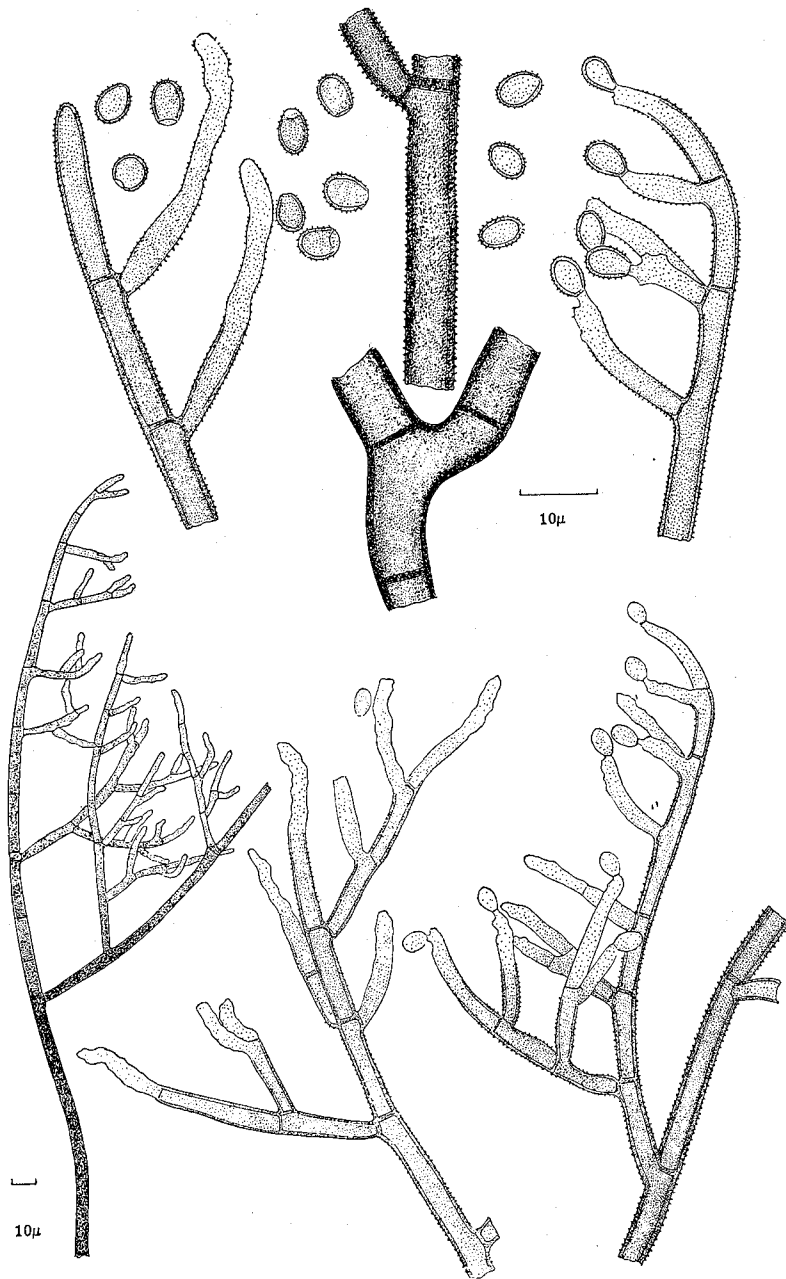


FIG. 26. *Conoplea elegantula* ( $\times 650$  except where indicated by the scales).

levia vel verrucosa,  $4-15\mu$  longa,  $2-4\mu$  crassa. *Conidia* singula in apice conidiophori oriunda, recta vel curvata, subsphaerica, oblonga, ellipsoidea, obovoidea vel clavata, brunnea vel fusca, verruculosa vel echinulata,  $20-55$  ( $37$ ) $\mu$  longa,  $10-25$  ( $17$ ) $\mu$  crassa, septis  $2-6$  transversalibus et  $1-4$  longitudinalibus praedita.

*Habitat* in inflorescentiis *Cynodontis dactyli*, Mongu airstrip, Zambia, A. Angus, 11.ii.1963, IMI 101184 typus.

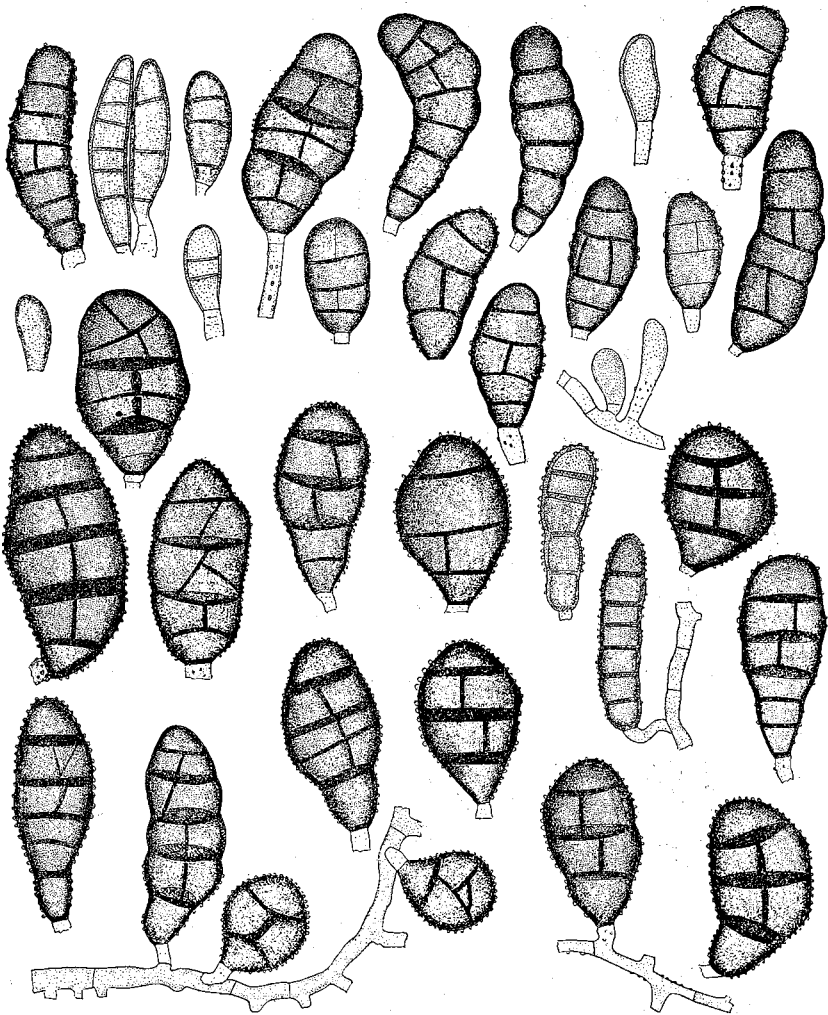


FIG. 27. *Pithomyces cynodontis* ( $\times 650$ ).

*Colonies* pulvinate or effused dark blackish brown to black. *Mycelium* superficial, composed of a network of branched, septate, subhyaline or straw coloured, smooth or rough-walled, 2–4 $\mu$  thick hyphae. *Conidiophores* borne singly, terminally and laterally on the hyphae, simple, straight or flexuous, cylindrical, pale straw coloured, smooth or verrucose, 4–15 $\mu$  long, 2–4 $\mu$  thick. *Conidia* formed singly as blown-out ends at the apex of each conidiophore, straight or curved, subspherical, oblong, ellipsoid, obovoid or clavate, brown to dark blackish brown, verruculose to echinulate, 20–55 (37) $\mu$  long, 10–25 (17) $\mu$  thick in the broadest part, with 2–6 transverse and 1–4 longitudinal septa.



The conidia usually become detached through fracture of the wall of the conidiophore and each conidium carries away with it the upper part of the conidiophore.

On inflorescences of *Cynodon dactylon*, Zambia. This fungus grows well in culture and sporulates freely on cornmeal, malt, potato-dextrose and potato-carrot agars at room temperature.

***Pithomyces pulvinatus*** (Cooke & Masee) M. B. Ellis comb. nov.

*Alternaria pulvinata* Cooke & Masee apud Cooke, March 1890, *Grevillea*, 18, No. 87, p. 56.

*Colonies* small, pulvinate, greyish to chocolate brown. *Mycelium* superficial composed of a mat of branched, septate, pale brown to brown, smooth-walled, 2–5 $\mu$  thick hyphae. *Conidiophores* borne singly, terminally and laterally on the

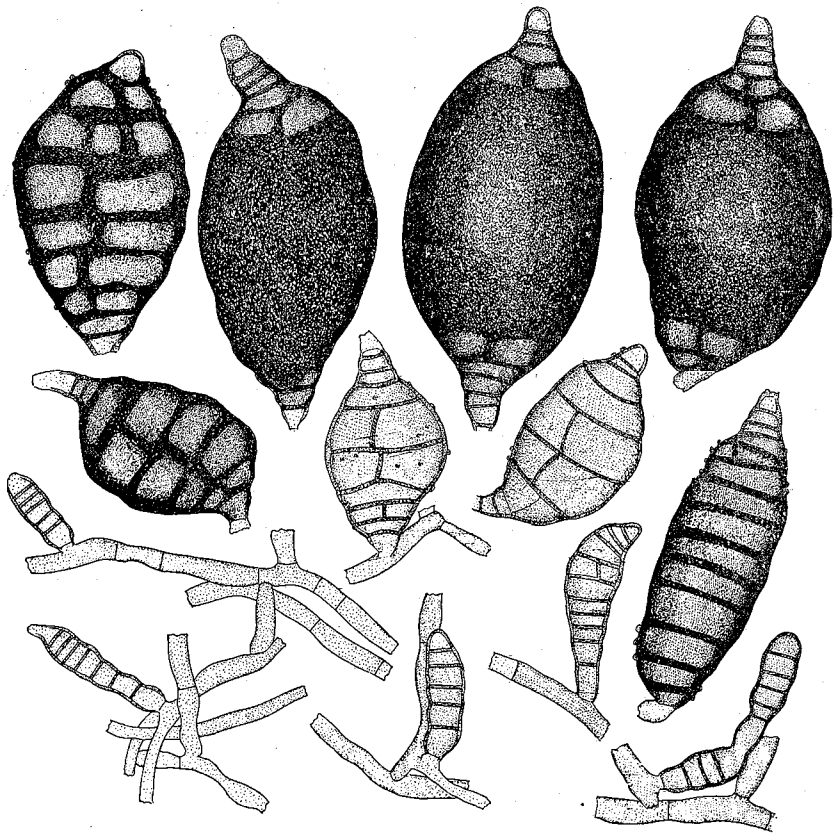


FIG. 28. *Pithomyces pulvinatus* ( $\times 650$ ).

hyphae, straight or curved, cylindrical, pale brown to brown, smooth-walled, 2–10 $\mu$  long, 2–4 $\mu$  thick. *Conidia* formed singly as blown-out ends at the apex of each conidiophore, straight or slightly curved, limoniform when mature, dark

brown to black, often opaque except near the apex and base, smooth to verrucose,  $45-90$  ( $62$ ) $\mu$  long,  $25-45$  ( $33$ ) $\mu$  thick in the broadest part, tapering rather abruptly to  $2-5\mu$  at each end, with  $5-13$  transverse septa and  $1-7$  longitudinal or oblique septa. The conidia usually become detached through fracture of the wall of the conidiophore and each conidium carries away with it the upper part of the conidiophore.

On palm trunks, Java, Kurz No. 529, type in Herb. K.

### SPADICOIDES

*Spadicoides afzeliae* M. B. Ellis spec. nov.

*Coloniae* hypophyllae, effusae, inconspicuae, pallide griseo-brunneae. *Mycelium* partim superficiale et partim in substrato immersum ex hyphis ramosis, septatis, pallide olivaceo-brunneis vel brunneis, levibus,  $1-5\mu$  crassis, reticulatis compositum. *Conidiophora* singula ex lateribus hypharum oriunda, erecta, simplicia, recta vel flexuosa, infra cylindrica, levia, sursum nodulosa et verrucis in striis dispositis ornata, interdum basi inflata vel lobata, brunnea vel atro-brunnea, usque ad  $450\mu$  longa,  $6-8\mu$  crassa. *Conidia* singula per poros ad apicem conidiophori et lateraliter oriunda, recta vel leniter curvata, ellipsoidea, basi

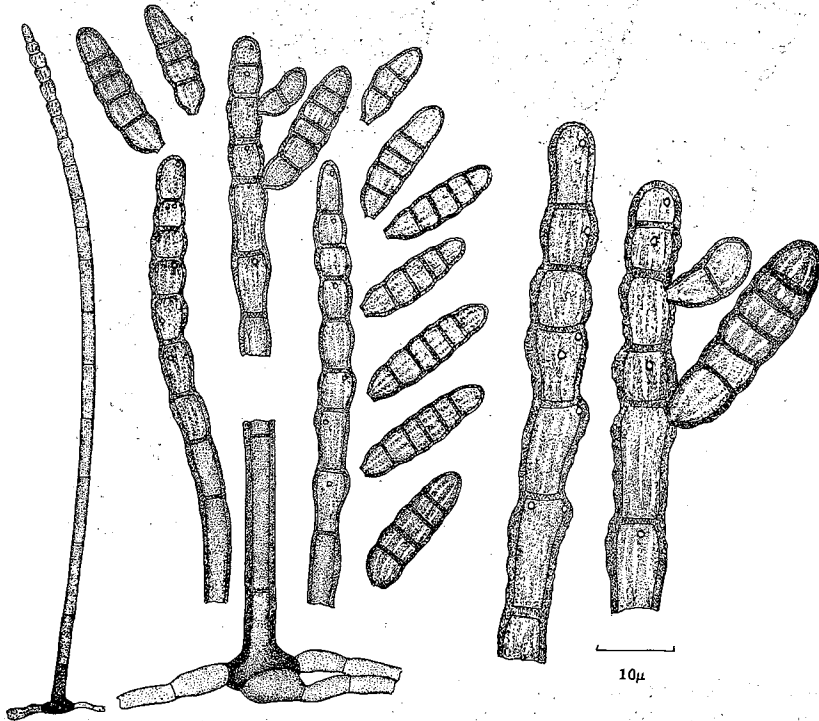


FIG. 29. *Spadicoides afzeliae* ( $\times 650$  except where indicated by the scale).

conico-truncata, 2-5 septata, ad septa constricta, brunnea, verrucis in striis dispositis ornata, 19-30 (28) $\mu$  longa, 6-8.5 (7.5) $\mu$  crassa, basi 2-2.5 $\mu$  lata. *Habitat* in foliis emortuis *Azeliae africanae*, Kindia, Guinea, J. Kranz, 10.i.1964, IMI 105020 d typus

*Colonies* hypophyllous, effused, inconspicuous, pale greyish brown. *Mycelium* partly superficial and partly immersed in the substratum, composed of a network of branched, septate, pale olivaceous brown, smooth-walled, 1-5 $\mu$  thick hyphae. *Conidiophores* arising singly and laterally on the hyphae, erect, simple, straight or flexuous, the lower part cylindrical and smooth-walled, the upper part nodulose and rough-walled with the thickenings arranged in lines, sometimes swollen or lobed at the base, brown or dark brown, up to 450 $\mu$  long, 6-8 $\mu$  thick. *Conidia* arising singly through pores in the wall of the upper part of the conidiophore, straight or slightly curved, ellipsoidal, conico-truncate at the base, 2-5-septate, constricted at the septa, brown, rough-walled with the thickenings arranged in lines, 19-30 (28) $\mu$  long, 6-8.5 (7.5) $\mu$  thick in the broadest part, 2-2.5 $\mu$  wide at the base.

On dead leaves of *Azelia africana*, Guinea.

### SPORIDESMIUM

*Sporidesmium bambusae* M. B. Ellis spec. nov.

*Coloniae* effusae, pilosae, fuscae. *Mycelium* in substrato immersum, ex hyphis ramosis, septatis, pallide brunneis vel brunneis, levibus, 2-4 $\mu$  crassis compositum. *Conidiophora* singula vel 2-4 fasciculata, ex apice lateribusque hypharum oriunda, erecta, simplicia, recta vel flexuosa, septata, brunnea vel atro-brunnea, levia, 40-90 $\mu$  longa, 5-7 $\mu$  crassa, per 0-3 proliferationes successivas, doliiformes elongascentia. *Conidia* singula, primo in apice conidiophori et dein proliferationis cujusque successivae oriunda, recta vel flexuosa, obclavata, interdum rostrata, ad basim conico-truncata, straminea vel pallide olivaceo-brunnea, levia, 8-11-pseudoseptata, 55-90 (71) $\mu$  longa, 13-16 (14) $\mu$  crassa, apicem versus ad 1-3 $\mu$  attenuata, basi 4-5 $\mu$  lata; cella basilari brunnea vel atro-brunnea. *Habitat* in culmis emortuis *Oxytenantherae abyssinicae*, inter Musaia et Okentu, Sierra Leone, P. W. Sellar, 10.viii.1963, IMI 103347 K typus.

*Colonies* effused, hairy, dark blackish brown. *Mycelium* immersed in the substratum, composed of branched, septate, pale brown to brown, smooth-walled 2-4 $\mu$  thick hyphae. *Conidiophores* arising singly or in groups of 2-4 terminally and laterally on the hyphae, erect, simple, straight or flexuous, septate, brown to dark brown, smooth-walled, 40-90 $\mu$  long, 5-7 $\mu$  thick, with 0-3 successive, more or less barrel-shaped proliferations. *Conidia* formed singly at the apex of each conidiophore which, after the first conidium has fallen, often proliferates straight on and forms another conidium at a higher level, straight or flexuous, obclavate, sometimes rostrate, conico-truncate at the base, straw coloured to pale olivaceous brown with a brown or dark brown basal

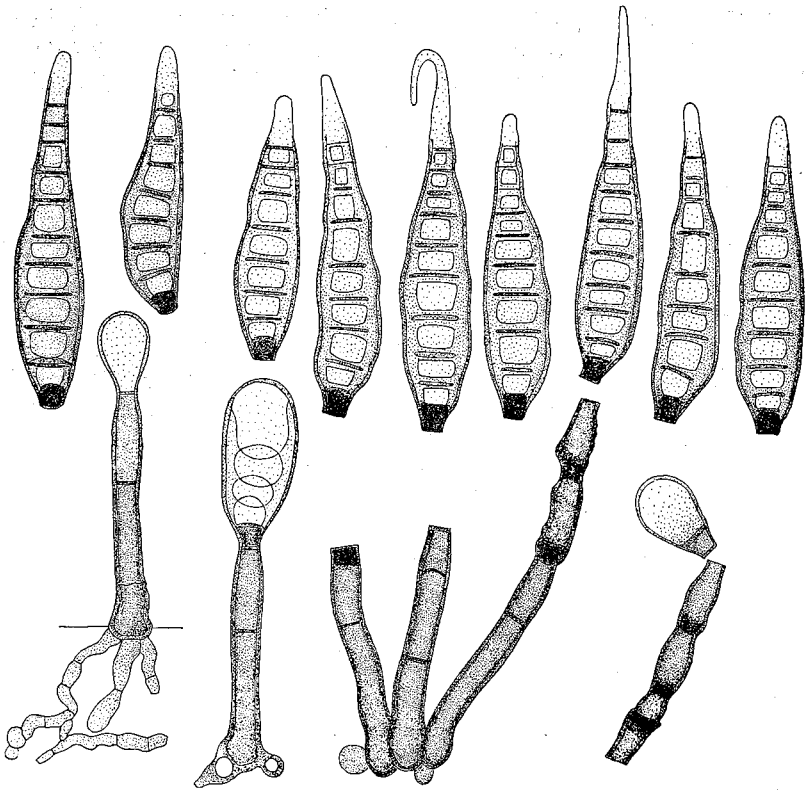


FIG. 30. *Sporidesmium bambusae* ( $\times 650$ ).

cell, smooth-walled, with 8–11 pseudosepta, 55–90 (71) $\mu$  long, 13–16 (14) $\mu$  thick in the broadest part, tapering to 1–3 $\mu$  near the apex, 4–5 $\mu$  wide, at the base.

On dead culms of *Oxytenanthera abyssinica*, Sierra Leone.

***Sporidesmium pseudoseptatum* M. B. Ellis spec. nov.**

*Coloniae* effusae, pilosae, fuscae. *Mycelium* partim superficiale et partim in substrato immersum, ex hyphis ramosis, septatis, pallide brunneis vel brunneis, levibus, 1–4 $\mu$  crassis compositum. *Conidiophora* singula vel 2–4 fasciculata ex apice lateribusque hypharum oriunda, erecta, simplicia, recta vel flexuosa, cylindrica, septata, brunnea vel atro-brunnea, sursum pallidiora, levia, 70–200 $\mu$  longa, 3–6 $\mu$  crassa, per 0–18 proliferationes successivas, cylindricas elongascentia. *Conidia* singula, primo in apice conidiophori et dein proliferationis cujusque successivae oriunda, recta vel flexuosa, obclavata vel subfusiformia, ad basim conico-truncata, pallide straminea, levia, 5–8-pseudoseptata, 36–56 (45) $\mu$  longa, 7–8 (7.7) $\mu$  crassa, apicem versus 2–3 $\mu$  attenuata, basi 3–4 $\mu$  lata. *Habitat* in ramulis emortuis arboris ignotae, prope Musaia, Sierra Leone, P. W. Sellar, 30.viii.1963, IMI 103457 a typus.

*Colonies* effused, hairy, dark blackish brown. *Mycelium* partly superficial and partly immersed in the substratum, composed of branched, septate, pale brown to brown, smooth-walled, 1–4 $\mu$  thick hyphae. *Conidiophores* arising singly or in groups of 2–4 terminally and laterally on the hyphae, erect, simple, straight or flexuous, cylindrical, septate, brown to dark brown, upper part

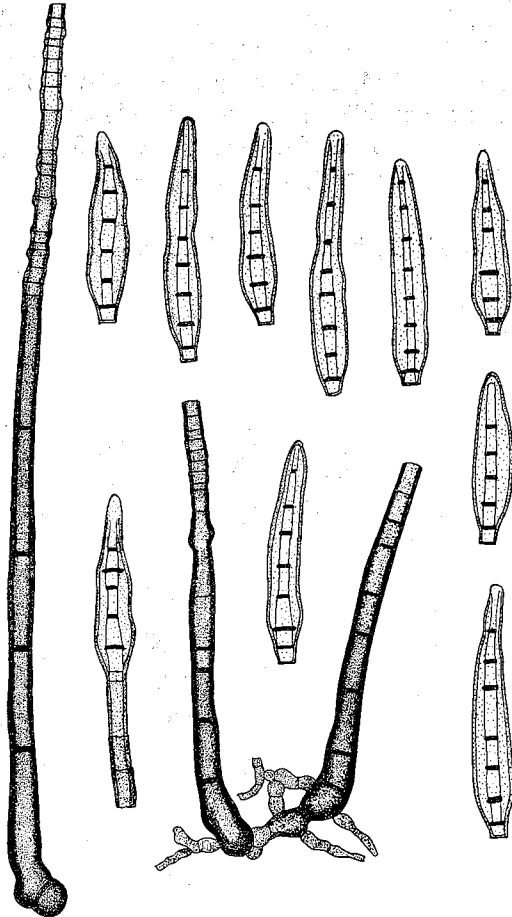


FIG. 31. *Sporidesmium pseudoseptatum* ( $\times 650$ ).

paler, smooth-walled, 70–200 $\mu$  long, 3–6 $\mu$  thick, with 0–18 successive, more or less cylindrical proliferations. *Conidia* formed singly at the apex of each conidiophore which, after the first conidium has fallen, proliferates straight on and forms another conidium at a higher level, straight or flexuous, obclavate to subfusiform, conico-truncate at the base, pale straw coloured, smooth-walled, with 5–8 pseudosepta, 36–56 (45) $\mu$  long, 7–8 (7.7) $\mu$  thick in the broadest part, tapering to 2–3 $\mu$  near the apex, 3–4 $\mu$  wide at the base.

On dead twigs, Sierra Leone.

**Sporidesmium macrotrichum** (Corda) Hughes, 1958, *Canad. J. Bot.*, **36**, p. 808.

*Helminthosporium macrotrichum* Corda, 1837, *Icones Fung.*, **1**, p. 13.

*Brachysporium macrotrichum* (Corda) Sacc., 1886, *Sylloge Fung.*, **4**, p. 425.

Colonies effused, black, hairy. Mycelium immersed in the substratum, composed of branched, septate, pale brown to brown, smooth-walled, 3–5 $\mu$  thick hyphae. Conidiophores arising singly or in small groups terminally and laterally on the hyphae, erect, simple, flexuous, septate with the septa often close together, dark brown to dark blackish brown by transmitted light, black and shining by reflected light, smooth-walled, up to 220 $\mu$  long, 6–9 $\mu$  thick. Conidia formed singly at the apex of the conidiophore, often slightly curved, navicular, pale to mid pale brown, smooth-walled, 4–7-pseudoseptate, 31–40 (35) $\mu$  long, 10–12 (10.4) $\mu$  thick in the broadest part, tapering to 3–5 $\mu$  near the apex, 6–7 $\mu$  wide at the truncate base.

On dead branches of *Carpinus*, Reichenberg, Czechoslovakia, type in Herb. PR, No. 15553.

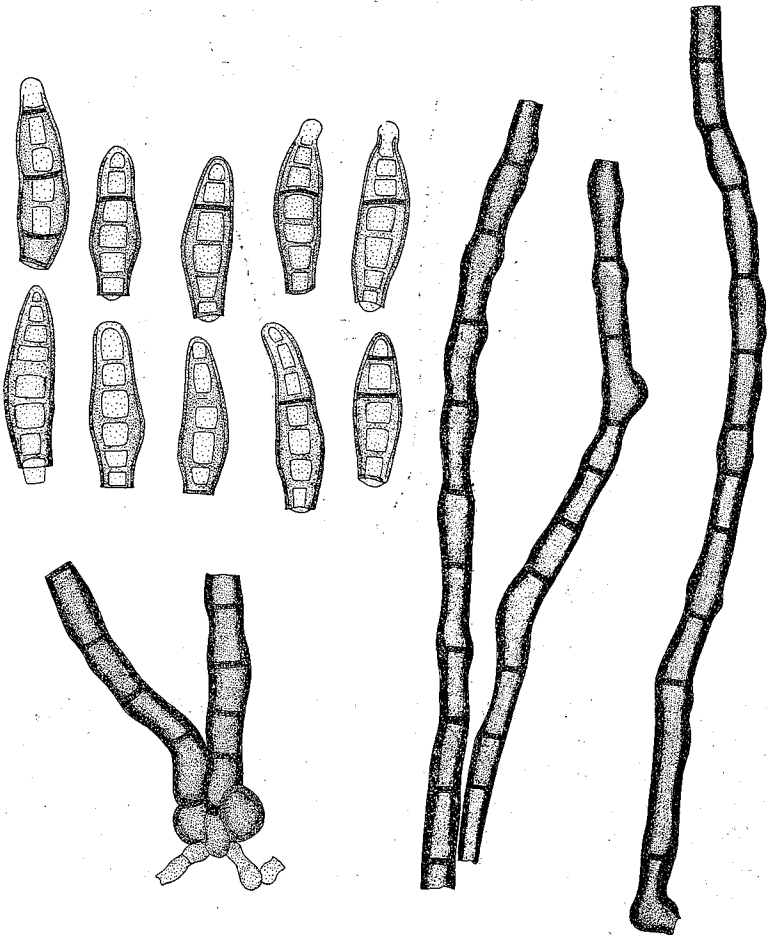


FIG. 32. *Sporidesmium macrotrichum* ( $\times 650$ ).