

The Cyphelloid Fungi of South Africa.

By

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The recorded species of South African cyphelloid fungi are examined in this paper. These are included in the genera *Aleurocystus*, *Aleurodiscus*, *Cyphella*, *Cytidia*, *Dendrothele*, *Gloeosoma*, *Porothelium*, *Solenia* and *Stigmatolemma*, some of which are invalid names requiring comment. These genera, with several others, have been classed among the families Theleporaceae, Cyphellaceae and Leptotaceae, but similarities in their structure permit of their treatment together as "cyphelloid fungi", until such time as their true relationships have been clarified.

Extensive use has again been made of Doidge's check-lists of South African fungi (in *Bothalia* 5, 1950). Herbarium numbers, unless otherwise stated, refer to specimens in the National Herbarium, Pretoria. Genera and species are considered in alphabetical order. Synonyms or doubtful records are printed in italics, and accepted species in bold face. Keys to the accepted species are given at the end of the paper.

Grateful thanks are due to Dr. Wm. Bridge Cooke for reading the manuscript, suggesting some alterations that have now been made, and generously allowing publication here of two new species that he has described from South African material. Some peculiarities of nomenclature that remain in the paper are the author's responsibility and are explained in the appropriate places.

The writer is indebted to the following for the loan of specimens: The Curator of Fungi, Smithsonian Institution; The Director, Royal Botanic Gardens, Kew; The Director, Muséum National D'Histoire Naturelle, Paris. The Trustees of the P. A. van der Byl Herbarium, University of Stellenbosch, kindly authorised a visit to the Herbarium to examine specimens in their keeping.*

ALEUROCYSTUS Lloyd.

Aleurocystus Lloyd (as McGinty) in Lloyd Myc. Notes 6 (1921) 1088, *nomen provisorium*. Further referred to in: Stevenson & Cash in Bull. Lloyd Library No. 35 (1936) 42; Martin in Lloydia 5 (1942) 162; Donk in Reinwardtia 1 (1951) 204-206.

Donk (loc. cit.) reasons that the names mischievously proposed by Lloyd under the pseudonym "N. J. McGinty" are to be regarded as *nomina provisoria*, and that under Art. 37 of the International Rules of Botanical Nomenclature their publication was invalid. This is certainly so regarding *Aleurocystus*, which Lloyd only suggested *could* be a segregate based on *Aleurodiscus capensis*, whose texture and cystidia set it apart from other species of *Aleurodiscus*. Donk also holds that Stevenson & Cash's (loc. cit.) reference to *Aleurocystus* amounts to "incidental mention", and again does not constitute valid publication under the same Article of the Rules. Stevenson & Cash listed the combination *Aleurocystus capensis*, attributing it to Lloyd who, however, made it only by implication and not literally.

* Deur die goedgeunstigheid van die Universiteit van Stellenbosch is 'n geleentheid aangebied om eksemplare in die Herbarium P. A. van der Byl te ondersoek. Vir sy hofflikheid en hulp gedurende my besoek wil ek graag dr. J. G. Smith bedank. Verdere verwysing na verskillende soorte in die van der Byl-Herbarium word hieronder gemaak.

It seems clear that the names *Aleurocystus* and *Aleurocystus capensis* are *nomina provisorioria* and therefore invalid. For *Aleurocystus capensis* see under *Cytidia habgallae* (B. & Br.) Martin.

ALEURODISCUS Rabenh. ex J. Schroet.

Aleurodiscus acerinus (Pers. ex Fr.) Höhnelt & Litsch. in K. Akad. Wiss. Wien Sitzungsab. 116 (1907) 804, Tab. 2, f. 6; Doidge loc. cit. p. 479.

Corticium acerinum Persoon, Obs. Myc. 1 (1796) 37.

Thelephora acerina (Pers.) Pers. ex Fr., Syst. Myc. 1 (1821) 453, Hym. Eur. (1874) 648; Persoon, Syn. Fung. (1801) 581, Myc. Eur. 1 (1822) 152; Léveille in Ann. Sci. Nat. ser. iii, 5 (1846) 150.

Stereum acerinum (Pers. ex Fr.) Fr., Epicrisis (1838) 554; Saccardo Syll. Fung. 6 (1888) 587.

Saccardo's reference to South African material does not specify a collection or locality, and cannot be traced further. Léveille published Drège 9452 from the Cape as *Thelephora (leijostroma) acerina* Pers. This collection is not deposited in the Paris Natural History Museum, and consequently it has not been possible to decide whether the species is represented in South Africa. The species differs from the variety *A. acerinus* var. *alliaceus* in the size and particularly the shape of its spores. *A. acerinus* has spores which are ovoid, with a ratio of length/width of about 1.6 (always less than 2.0), and a size of 5.6-6.4 × 8.0-12 μ (6-7 × 10-13 μ fide Höhnelt & Litschauer).

Aleurodiscus acerinus (Pers. ex Fr.) Höhnelt & Litsch. var. *alliaceus* (Quélet) Bourd. & Galz. in Bull. Soc. Myc. de Fr. 28 (1912) 352, Hym. de Fr. (1928) 334; Pilát in Ann. Myc. 24 (1926) 217, Tab. 15, f. 11.

Corticium alliaceum Quélet, F. Myc. de Fr. (1888) 5; Saccardo Syll. Fung. 6 (1888) 629.

Aleurodiscus acerinus (Pers. ex Fr.) Höhnelt & Litsch. var. *longisporus* Höhnelt & Litsch. (!) in K. Akad. Wiss. Wien Sitzungsab. 116 (1907) 805, Pl. 2, f. 4; van der Byl in Ann. Univ. Stellenbosch 7 (1929) 25; Doidge loc. cit. p. 479; Talbot in Bothalia 6 (1951) 26, Pl. 18.

FIG. 1.

Since seeing more material of the Type of *A. acerinus* var. *longisporus* (viz. MacOwan 1074, distributed under Nos. 20840 and 21947 in the National Herbarium, Pretoria) the writer has found it necessary to emend the description and comments given previously on this variety (Talbot, 1951, loc. cit.). Further, accepting the synonymy of *A. acerinus* var. *longisporus* and *A. acerinus* var. *alliaceus*, the latter name should be used as it has priority.

After much search, eight spores were found in the Type of var. *longisporus*. These measured 4.8 × 9-17.6 μ (smallest 4 × 9 μ; two largest 8 × 16 μ and 6.4 × 17.6 μ). They were long-elliptical, or almost cylindrical, with one side usually somewhat depressed. Their length was 2.0-2.8 times as great as their width. In European material of *A. acerinus* spores were found to have a length 1.4-1.9 times as great as their width. Literature records of the spore measurements of the species and its varieties were analysed, with the following results:—

A. acerinus: Ratio length/width = 1.4-1.8: average 1.6.

A. acerinus var. *longisporus*: Ratio length/width = 1.9-2.9: average 2.4.

A. acerinus var. *alliaceus*: Ratio length/width = 2.0-2.5: average 2.25.

It appears from this that the spores of *A. acerinus* are more ovoid (besides being usually shorter) than those of the varieties *longisporus* and *alliaceus*, thus substantiating a varietal difference from the main species. Also it is evident that the spores of the two varieties have essentially the same shape and order of size, and that only one variety, *alliaceus* being its prior name, is merited.

If only the size ranges of these various spores are taken into account, and their shape (i.e. ratio length/width) is disregarded, then the spores of the main species may fall within the size range of the spores of the varieties, and the erection of varieties would be questionable. For example, the spores of *A. acerinus* have a range of $6\text{--}7 \times 10\text{--}13 \mu$ (fide Höhnel & Litschauer) which lies within the range of $4\text{--}8 \times 9\text{--}17\cdot6 \mu$ measured by the author for spores of *A. acerinus* var. *longisporus*. Yet the spore shapes are distinct and the varietal difference is legitimate.

An emended description of *A. acerinus* var. *alliaceus* follows:—

Fructifications resupinate, irregularly expanded, crustose, adnate, chalk-white becoming pallid ivory-white, finely and closely cracked, having a determinate margin; in section up to $80\text{--}100 \mu$ thick.

Basidia: cylindrical to subclavate with a wavy outline, $35\text{--}60 \times 5\text{--}8\cdot5 \mu$, with 2 or 4 sterigmata.

Spores: long elliptical, often with one side flattened, or subcylindrical, more than twice as long as broad, $4\text{--}8 \times 9\text{--}17\cdot6 \mu$, smooth, hyaline.

Paraphyses: (1) basidia modified into pseudophyses which are bulbous with a short to long, narrow, apical outgrowth; $10\text{--}15 \times 25\text{--}35 \mu$, with the outgrowth up to $16 \times 3 \mu$, (2) racemosely branched paraphysoids (dendrophyses) between and beyond the basidia, very heavily encrusted with minerals, extensions of the hyphal system, 2μ or less in width.

Hyphae: 2μ or less in width, hyaline, erect, much branched and closely arranged in the basal part, very heavily encrusted, emerging as dendrophyses.

Specimens examined: 20840, 21947 (both MacOwan 1074, type of *A. acerinus* var. *longisporus*). Two other collections, 27566 and 39058 may belong here, but no spores were seen with certainty.

Aleurodiscus acerinus (Pers. ex Fr.) Höhnel & Litsch. var. *longisporus* Höhnel & Litsch. (!) in K. Akad. Wiss. Wien Sitzungsab. 116 (1907) 805, Pl. 2, f. 4; van der Byl in Ann. Univ. Stellenbosch 7 (1929) 25; Doidge loc. cit. p. 479; Talbot in Bothalia 6 (1951) 26, Pl. 18.

= *Aleurodiscus acerinus* (Pers. ex Fr.) Höhnel & Litsch. var. *alliaceus* (Quél.) Bourd. & Galz. See previous entry.

Aleurodiscus botryosus Burt in Ann. Mo. Bot. Gard. 5 (1918) 198, f. 10; Bourdot & Galzin, Hym. de Fr. (1928) 332, f. 102.

FIG. 3.

Fructifications effused, resupinate, thin firmly adherent, white then later straw-coloured, smooth, becoming cracked when old into small areas; margin similar, thinning out to pruinose. Up to 360μ thick in section. Fructifications sometimes confluent.

Basidia: none seen mature, clavate, $60\text{--}70 \times 8\text{--}10 \mu$ when immature.

Spores: hyaline, smooth, broad elliptical to ovoid, amyloid, $13\cdot5\text{--}15 \times 7\cdot5\text{--}8 \mu$. Gloeocystidia: embedded in stages from the basal tissues to the hymenium, thinwalled, with yellowish granular or homogeneous contents, subcylindrical, flexuous, or clavate or pyriform, $50\text{--}110 \times 9\text{--}17\text{--}(20) \mu$.

Paraphyses: dendrophyses of a peculiar type found in the hymenium and in lower tissues composed of a short main axis $1.5-4 \mu$ diam., with short lateral branches bearing minute spherical granules which show a strong amyloid reaction.

Minerals: abundant throughout.

Hyphae: thinwalled, hyaline, $2-2.5 \mu$ diam., suberect, no clamps seen.

Specimens examined: Universiteit van Stellenbosch, Herbarium P. A. van der Byl nr. 2261, Knysna (as *Aleurodiscus cerussatus*).

The presence of yellowish gloeocystidia and dendrophyses together, distinguishes this species from other *Aleurodiscus* species so far seen in South Africa. This fungus differs from *A. cerussatus*, where v. d. Byl placed it, mainly in the nature of its dendrophyses occurring throughout the tissues and bearing amyloid granules.

The accessory organs of *A. cerussatus* are to be classed rather as acanthophyses (bottle-brush paraphyses) than dendrophyses, and are confined to the hymenium. *Aleurodiscus roseus* is distinguished by the rose-coloured hymenium, lack of gloeocystidia, presence of clamp connections and presence of normal type of dendrophysis with large, irregular branches.

Aleurodiscus capensis Lloyd (!) in Lloyd Myc. Notes 6 (1920) 930, fig. 1687, *ibid.* 6 (1921) 1088; Stevenson & Cash in Bull. Lloyd Library No. 35 (1936) 43; Doidge loc. cit. p. 484.

On examination of the type specimen (v. d. Byl No. 833 in the Lloyd Mycological Collection No. 34029), the writer agrees with Martin (in *Lloydia* 5, 1942, 161-162) and W. B. Cooke (in *Mycologia* 43, 1951, 208-209) that this species must be referred to *Cytidia habgallae* (Berk. & Br.) Martin.

Aleurodiscus cerussatus (Bres.) Höhnelt & Litsch. in K. Akad. Wiss. Wien Sitzungsber. 116 (1907) 807, Pl. 4, f. 1; van der Byl in Ann. Univ. Stellenbosch 7 (1929) 25, f. 8; Doidge loc. cit. p. 479.

The specimen on which this record is based is Universiteit van Stellenbosch, Herbarium P. A. van der Byl nr. 2261, Knysna. This specimen is considered to be *Aleurodiscus botryosus* Burt, and consequently *A. cerussatus* should be omitted from South African lists.

Aleurodiscus corneus (Lloyd) Lloyd (!) in Lloyd Myc. Notes 6 (1920) 930, f. 1688; Stevenson & Cash in Bull. Lloyd Library No. 35 (1936) 43; Doidge loc. cit. p. 484.

Cytidia cornea Lloyd (!) in Lloyd Myc. Notes 5 (1917) 656, figs. 935-937; Doidge loc. cit. p. 484.

On examination of the type of this species, Duthie 154 in the Lloyd Mycological Collections No. 34063, the author agrees with Martin (in *Lloydia* 5, 1942, 161) and W. B. Cooke (in *Mycologia* 43, 1951, 208) that the species should be referred to *Cytidia habgallae* (Berk. & Br.) Martin.

Aleurodiscus disciformis (DC. ex Fr.) Patouillard in Bull. Soc. Myc. de Fr. 10 (1894) 80; Burt in Ann. Mo. Bot. Gard. 13 (1926) 305; v. d. Byl in Ann. Univ. Stellenbosch 7 (1929) 24, f. 7; Doidge loc. cit. p. 479.

Thelephora disciformis DC. ex Fr., Syst. Myc. 1 (1821) 443.

FIG. 4.

Fructifications effused, resupinate, white, eventually greyish or yellowish and cracked. Section about 500μ thick.

Basidia: $12.5-21 \times 65-100 \mu$, long-clavate, with 2-4 sterigmata up to $2-3 \mu$ wide and $10-20 \mu$ long.

Spores: hyaline, smooth, $18-22 \times 12.5-16 \mu$, amyloid, ovate to subglobose, sometimes showing a distinct apiculus.

Paraphyses: (1) gloeocystidioid, with a tendency to become irregularly swollen or moniliform, but usually subcylindrical, hyaline, thinwalled. (2) simple cylindrical paraphyses, thinwalled, 2·5–3·5 μ diam.

Hyphae: 3–5 μ diam., with rather rigid walls, colourless, encrusted with mineral matter.

Specimens examined: Universiteit van Stellenbosch, Herbarium P. A. van der Byl nr. 658, on *Podocarpus*, Stellenbosch.

This specimen was evidently determined by Burt, who cited it, loc. cit. It appears to fit *A. disciformis*. The author however, saw no submoniliform paraphyses 5–9 μ wide, which are seen in European material. This may have been due to the hurried circumstances under which the examination was made in the v. d. Byl Herbarium, for van der Byl mentions paraphyses of that sort in his description.

Aleurodiscus mirabilis (Berk. & Curt.) Höhnelt in K. Akad. Wiss. Wien Sitzungsab. 118 (1909) 818.

Psilopeziza mirabilis Berk. & Curt. in Journ. Linn. Soc. Bot. 10 (1868) 364.

Aleurodiscus apiculatus Burt in Ann. Mo. Gard. 5 (1918) 186, f. 4. An extensive synonymy is given by Rogers & Jackson in Farlowia 1 (1943) 267.

FIG. 3.

Fructifications resupinate, effused with a narrow reflexed margin, membranous to coriaceous, pinkish when fresh, drying light yellow-brown or buff; hymenium even, not cracking, minutely pruinose under a lens; margin reflexed and rolling slightly inwards, villose or byssoid, pale coloured, almost white; thickness in section 350–600 μ . Basidia: clavate, up to 120–170 \times 26–33 μ , with four stout conical sterigmata up to 25 \times 6 μ ; some basidia have a bulbous base decorated at the constriction with hyaline, unbranched, blunt spines up to 4 μ long.

Spores: hyaline, biapiculate, semilunate, up to 22·8 \times 13·7 μ , with one side depressed, smooth (becoming minutely echinate, and 20–25 \times 12–15 μ , fide Burt, loc. cit.).

Paraphysoids: (1) very numerous acanthophyses, some representing aborted basidia, others modified hyphae; clavate, hyaline, stoutwalled, with a long attenuated base, of the same dimensions as the basidia, decorated towards the base of the clavate part with hyaline spines. (2) hyphoid, hyaline, thickwalled, 53–66 μ long, decorated with hyaline aculeate spines, closely or sparsely arranged, the terminal branches of some subhymenial hyphae. (3) simple, unbranched paraphysoids, hyaline, somewhat flexuous, subcylindrical, about 130 \times 8–9 μ , some quite smooth, others tending towards acanthophyses with a few basal spines.

Hyphae: hyaline, thickwalled, 4·5–3 μ wide, with occasional clamp connections, septate, branched, not encrusted.

Tissues: basal tissues composed of loosely intertexted hyphae which give the byssoid, white appearance to the margin; other tissues compactly arranged.

Specimens examined: 36768, *Talbot* (54), on *Hypericum*, Quedni.

As remarked by Rogers & Jackson (loc. cit.), the sublunate, biapiculate spores and the abundant thickwalled long-appendiculate acanthophyses are the chief diagnostic features of this remarkable species. In the present specimen there are minor variations from Burt's description, e.g. the presence of clamp connections and the fact that no echinulate spores were seen. I have no doubts, however, in referring it to *A. mirabilis*. When fresh, the rosy pink colour of the fungus, effused widely over the substratum, was most conspicuous.

Aleurodiscus polygonioides (Karst.) Pilát in Ann. Mycol. 24 (1926) 221.

Corticium polygonioides Karsten, Symb. ad Myc. Fenn. 8 (1881) 12; Bourdot & Galzin in Bull. Soc. Myc. de Fr. 27 (1911) 232, Hym. de Fr. (1928) 227, f. 69.

FIG. 5.

Fructifications at first orbicular, resupinate, later confluent and widely effused, remaining resupinate, membranous. Hymenium smooth, pruinose, eventually somewhat cracked, purplish, violet or lilac coloured when fresh, becoming duller later or changing to brownish or clay coloured. Margin whitish, pruinose when young, later concolorous with the hymenium. Thickness in section 195–325 μ .

Basidia: about 50–70 \times 7–11 μ but immature; ovoid to pyriform and clustered when young, developing to irregularly clavate or subcylindrical.

Spores: (4.8)–6.4–8–(9.6) \times (8.8)–10.4–14.4 μ , ovate or broad elliptical, with a distinct apiculus, hyaline, smooth, not amyloid.

Paraphyses: Dendrophyses present in profusion, hyaline to faintly coloured, bearing faintly coloured granules, arising from the tramal hyphae, their main axis 2–4 μ wide. Hyphae: hyaline, branched, septate, 2.5–4.8 μ wide, with clamp connections, the walls thin or a little thickened, lying more or less horizontally in the basal tissues, giving rise to erect dendrophyses.

Specimens examined: 40226, *H. King*, on *Lonicera*, Pretoria; 36903, 39072, *Talbot*, Hennops River; 36904, *Talbot*, on *Buddleja salvifolia*, Hennops River; 17817, *F. Eyles* (2102), on *Combretum*, Salisbury, S.R. (as *Stereum purpureum*).

This species has much the same structure as *Aleurodiscus roseus* but is readily distinguished by its colour. It is clear from Bourdot & Galzin's (1928, p. 336) notes that *Aleurodiscus ionides* is remarkably similar to *A. polygonioides*. I have disposed the present specimens under the latter name solely on the strength of Bourdot & Galzin's comment that *A. ionides* differs from *A. polygonioides* in having a ceraceous texture, not membranous, later becoming hardened and subcrustaceous and adhering strongly to the substratum.

Aleurodiscus roseus (Pers. ex Fr.) Höhnelt & Litsch. in K. Akad. Wiss. Wien Sitzungsber. 115 (1906) 1568; Pilát in Ann. Mycol. 24 (1926) 219; Rogers & Jackson in Farlowia 1 (1943) 299.

Corticium roseum (Pers. ex Fr.) Fr., Epicrisis Syst. Myc. (1838) 560; Burt in Ann. Mo. Bot. Gard. 13 (1926) 224; Bourdot & Galzin, Hym. de Fr. (1928) 227.

Thelephora rosea Pers. ex Fr., Syst. Myc. 1 (1821) 451.

A fuller synonymy is given by Pilát, Rogers & Jackson, and Burt.

FIG. 6.

Fructifications at first orbicular with a slightly raised margin, later confluent, effused, resupinate with an appressed or raised margin. Hymenium light rose-coloured, paling later, smooth, pruinose. Margin white, shortly fibrillose. Texture membranous to pellicular. Thickness in section 200–220 μ .

Basidia: discontinuous, remaining immature for a long time, 30–55 \times 5–7 μ (immature), exceeded by the paraphyses, ovate to pyriform when young, becoming cylindrical to clavate.

Spores: smooth, hyaline, ovate to broad elliptical, apiculate, 6.4–8.8 \times 8–10.4 μ . Paraphyses: Dendrophyses abundant, their main axis about 2.4 μ wide, richly branched, arising from the lower hyphae, encrusted with minerals.

Hyphae: about 2.4 μ wide, hyaline, branched, septate, not encrusted, with clamp connections, the walls thin or a little thickened.

Specimens examined: All on *Acacia mollissima*: 39055, 39056, Talbot, Atholl Expt. Stn.; 39054, Simpson & Talbot (31), Qudeni.

A. roseus falls in the same group as *A. polygonioides* but the two are readily distinguished by their colour. The spore measurements given above, while falling in the range for this species in Europe ($8-16.5 \times 6-10 \mu$, fide Bourdot & Galzin), are rather small.

CYPHELLA Fries.

Donk (in Bull. Bot. Gard. Buitenzorg ser. iii, 17, 1941, pp. 159-160; *ibid.* ser. iii, 18, 1949, pp. 88-89 and 159) proposed the conservation of *Aleurodiscus* Rabenh. ex J. Schroet. against *Cyphella* Fr. The proposal was supported by Rogers (in Farlowia 3, 1949, p. 433) and was adopted by the Stockholm Congress. Thus the use in this paper of the name *Cyphella* is nomenclaturally improper, and an explanation is required.

The series of studies of which this paper forms a part, are intended to check the validity of the recorded species of South African Thelephoraceae, and to indicate synonyms and incorrect specific determinations where possible. Such work is essential before the many species that await collection may be identified and described. With few exceptions the type of revisionary work making a fundamental contribution to the broader aspects of classification and nomenclature can only be expected from the older countries with their better herbarium and library facilities. The dilemma in which the writer is now placed is whether to withhold publication of the facts uncovered about the South African species of *Cyphella*, or whether to act against the decision of Congress by retaining this invalid name in publication. It appears that as a temporary measure, until someone more favourably situated has monographed the genus and placed the species in generic segregates likely to have some stability, the interests of progress in mycology are better served by adopting the latter course.

Cyphella alboviolascens (Alb. & Schw. ex Fr.) Karsten in Finska Vet.-Soc. Bidrag Natur och Folk 37 (1882) 133; Saccardo Syll. Fung. 6 (1888) 669; van der Byl in Ann. Univ. Stellenbosch 7 (1929) 12; Doidge loc. cit. p. 483.

Peziza alboviolascens Alb. & Schw. ex Fr., Syst. Myc. 2 (1823) 96; Alb. & Schw., Consp. Fung. (1805) 322, Pl. 8. f. 4.

Cyphella curreyi Berk. & Br. (!) in Ann. Mag. Nat. Hist. iii, 7 (1861) 379; Kalchbrenner in Grevillea 10 (1882) 104.

FIG. 7.

Fructifications sessile, lacking a subiculum, globose, later cupulate, 1-3 mm. diam., white, covered with abundant long, villose or strigose hairs arising from the base and sides of the cupule. Margin involute, closing the fructification when dry. Hymenium smooth, pale coloured, very light tawny (in European specimens also pale violet, grey-lilac, glaucous or greenish).

Basidia: clavate, $40-60 \times 8-10 \mu$, occasionally with a basal clamp.

Spores: broad ovate to pip-shaped, often with a prominent apiculus, inequilateral, $11.2-14.4 \times 9.9-6-(11.6) \mu$.

Hyphae: more or less horizontally arranged at the base of the cupule, hyaline, smooth, with occasional clamps, $1.5-3 \mu$ diam., compact and entangled beneath the hymenium.

Surface hairs: up to $200 \times 5-7 \mu$, very thick-walled, with a narrow lumen, rounded at the apex, with finely roughened walls becoming smooth towards the base, and often encrusted with mineral granules.

Specimens examined: Universiteit van Stellenbosch, Herbarium P. A. van der Byl nr. 2503, E. D. Loseby, on *Vitis*, Stellenbosch.

This collection corresponds very well with European material of *Cyphella alboviolascens*. Another specimen filed as this species in the van der Byl Herbarium No. 2524, proved on examination to be *Cytidia flocculenta*. The material on which Kalchbrenner based his record of *Cyphella curreyi* has not been traced; *C. curreyi* B. & Br. (!) is a synonym of *Cyphella alboviolascens*.

***Cyphella applanata* sp. nov.**

FIG. 12.

Fructifications 0.5–2 mm. diam., sessile, resupinate with upturned margin forming a flat, saucer-like body of membranous texture. Margin lobed, white, villose, the hairs covered with a white mineral incrustation. Hymenium smooth, dirty white to lightly greyed fawn.

Basidia: clavate, with 4 sterigmata, 17–25 × 4.5–5.5 μ .

Spores: hyaline, smooth, cylindrical to cylindrical-curved with a depressed side, often cohering in groups of four, 3.2–4.8 × (6.4)–8–11.2 μ .

Hyphae: very fine, hyaline, with occasional clamps.

Hairs: thinwalled, pale yellowish, without clamps, heavily encrusted with acicular crystals, 2.4 μ wide without the crystal layer, forming a thick white, villose covering to the upturned margin.

Specimens examined: Type, 33350, *E. M. Laughton*, Eshowe, Zululand, Nov. 1941.

In its flat, discoid fructification with upturned, lobate margin, this species is not unlike *C. bloxami* and *C. disciformis* as described by Pilát (in Ann. Mycol. 22, 1924, 212) but differs in the shape and size of its spores and in having incrustated hairs.
Cyphella applanata sp. nov.

Carposomata disciforma, applanata, 0.5–2 mm. diam., tenuissime membranaceo; margo lobata, extus pilis densis, simplicibus, 2.4 μ crassis, crystallis densissime incrustatis. Hymenium leve, sordide albidum vel griseo-fulvum. Basidia clavata, hyalina, 17–25 × 4.5–5.5 μ , sterigmatibus 4. Sporae hyalinae, leves, cylindraceae vel saepe subcurvulae et uno latere compressae. Hyphae hyalinae, tenuissimae, saepe nodosae. Pili tenue tunicati, haud nodosi, 2.4 μ crassi, crystallis granulosissimis dense villosi, substraminei. Typus, 33350, leg. *E. M. Laughton*, Eshowe.

Cyphella cheesmani Masee apud Cheesman in Journ. Linn. Soc. Bot. 38 (1909) 411; Saccardo Syll. Fung. 21 (1912) 422; Doidge, loc. cit. p. 483.

The writer has not traced any specimen of this species, but as it appears well characterised by its spores it is accepted and keyed out with the other species of *Cyphella*. A translation of Saccardo's description follows.

Membranous, sessile, cupular then flattened, with villose exterior, white, 1 mm. diam.; hymenium lightly plicate; basidia clavate with four sterigmata; spores ovoid, finely asperulate, hyaline, 12–15 × 7–8 μ .

Cyphella curreyi Berk & Br. (!) in Ann. Mag. Nat. Hist. iii, 7 (1861) 379; Kalchbrenner in Grevillea 10 (1882) 104.

Recorded by Kalchbrenner for an unnumbered collection of MacOwan from Somerset East. This collection has not been traced. *C. curreyi* is a synonym of *Cyphella alboviolascens* (Alb. & Schw. ex Fr.) Karst.

Cyphella farinacea Kalchbr. & Cooke (!) in Grevillea 9 (1880) 18; Kalchbrenner in Grevillea 10 (1882) 104; Saccardo Syll. Fung. 6 (1888) 671; Doidge loc. cit. p. 483.

FIG. 8.

Cupules gregarious, often touching one another, very shortly stalked or sessile, 0.3–1.5 mm. diam. when dry, discoid, becoming flattened, with inrolled margin when dry. Exterior covered with greyish-white meal composed not of hyphae but of mineral matter. Hymenium olivaceous or usually cinereous to blackish. General appearance is greyish with a dark interior.

Basidia: clavate, with 4 sterigmata, $6.5 \times 19\text{--}20 \mu$, with basal clamps.

Spores: hyaline to faint yellow, smooth or appearing very minutely punctate, ovate or almost globose, $4.8\text{--}6.4 \mu$ diam.

Hyphae: hyaline, septate, branched, with frequent large clamps which are often looped, subgelatinous, much entangled, $1.5\text{--}1.8 \mu$ diam.

Specimens examined: Type, MacOwan (1221) in Herb. Kew and in Pretoria sub No. 20807.

Cyphella friesii Quélet, Champ. du Jura et des Vosges iii (1875) 15; Kalchbrenner in Grev. 10 (1882) 104.

This species was recorded by Kalchbrenner for an unnumbered collection of MacOwan from Somerset East. Doidge (loc. cit. p. 483) takes up this record under *Cyphella friesii* Crouan (described by Crouan in Florule du Finistere, 1867, 62).

The author is indebted to Dr. R. W. G. Dennis for drawing attention to yet another *Cyphella friesii*, described by Weinmann (in Hymeno-et GasteroMycetes hucusque in imperio Rossico observatos, 1836, 523) and antedating both Crouan's and Quélet's species, neither of which thus have any nomenclatorial standing. The different spelling of the epithet "Frisei" in Weinmann's description is clearly a misprint since it appears in Weinmann's own index as "Friesii Weinmann" and is obviously proposed in honour of Fries.

The material of Kalchbrenner's record has been examined (see Fig. 20), but is in too poor a condition to describe under a new name or to identify with a species already named. A brief description of this material follows:—

Cupules membranous, shortly stipitate or cuneate tapering to a sessile, reduced base; about $3\text{--}3.5 \times 1.5\text{--}2$ mm. in size; light dirty yellowish-brown, with a surface composed of cohering and flattened matted fibrils. Hymenium light yellowish-brown. Margin indistinctly incised-lobate. No basidia were seen. Abundant spores were present but it is doubtful whether they belong; they were globose, lightly coloured, minutely echinate, $3.5\text{--}4 \mu$ diam. The context hyphae were indistinct, but hyaline and about 1.5μ diam. The surface hyphae were hyaline, thickwalled with a narrow lumen, branched, $4\text{--}6.5 \mu$ diam.

Cyphella fulvodisca Cooke & Masee (!) in Grev. 18 (1890) 50; Scott Elliot in Hedwigia 29 (1890) 66, Tab. 1; van der Byl in Ann. Univ. Stellenbosch 7 (1929) 11; Saccardo Syll. Fung. 9 (1891) 247; Doidge loc. cit. p. 483.

FIG. 11.

= *Cyphella variolosa* Kalchbr. (!).

Cyphella pelargonii Kalchbr. (!) apud von Thuemen in Flora 68 (1875) 378; Saccardo Syll. Fung. 6 (1888) 677; van der Byl in Ann. Univ. Stellenbosch 7 (1929) 11; Doidge loc. cit. p. 483.

FIG. 13.

Cupules closely gregarious in groups of 6–20, somewhat coherent with one another, rather horny when dry, light beige colour but appearing whitish owing to the presence of white pruinose hairs on the outside, about 1 mm. long and 0.5–0.8 mm. wide, more or less cylindrical with a tapered base. Hymenium yellow-brown.

Basidia: clavate, $25\text{--}35 \times 6\text{--}8 \mu$.

Spores: light yellow-brown, smooth, with a small apiculus, elliptical to broad ovate, $5.5-6.8 \times 8.3-10 \mu$.

Hyphae: colourless, thickwalled, with only a narrow lumen staining, somewhat gelatinised, with clamp connections, $3.4-8-(6.4) \mu$ wide.

Surface hairs: yellow-brown with a lighter, rounded apex, appearing white macroscopically owing to the presence of mineral incrustation, $(25)-40-60 \times (3.5)-4-6 \mu$, occasionally with a basal clamp connection.

Specimens examined: Type, *MacOwan*, Cap. b. sp., Herb. Kalchbr., in Herb. Kew. See also the discussion under *Cyphella variolosa*.

Cyphella punctiformis (Fr.) Karst., Fung. Fenn. Exsicc. N. 714; Saccardo Syll. Fung. 6 (1888) 678; van der Byl in Ann. Univ. Stellenbosch 7 (1929) 12; Doidge loc. cit. p. 483.

Peziza punctiformis Fr., Syst. Myc. 2 (1823) 105.

The above-cited records of this species for South Africa would appear to rest on the MacOwan collection from Somerset East (see next entry) which Kalchbrenner & Cooke determined as *C. punctiformis* var. *strigosa*, except for Doidge's citation of No. 28673 (*Rump* 311). This latter collection was wrongly determined, being in fact a very minute agaric, with most distinct lamellae and cheilo- and pleurocystidia. On present knowledge this species is not considered to be represented in South Africa.

Cyphella punctiformis (Fr.) Karst. var. *strigosa* Kalchbr. & Cooke in Grevillea 9 (1880) 18; Kalchbrenner in Grevillea 10 (1882) 104.

Peziza punctiformis Fr. *pr. parte*, fide Kalchbrenner loc. cit.

The habitat on rotten leaves is suggestive of *Cyphella punctiformis*, but apparently no specimen is in existence. The "description" given by Kalchbrenner & Cooke consists of three words, "Pilis elongatis, granulatis", which hardly may be taken to validate a new variety, especially as it applies equally well to the main species. While not accepting the species or variety on present knowledge as being represented in South Africa, I have thought it worth while to give a description of *C. punctiformis*, translated from Bourdot & Galzin (Hym. de Fr., 1928, p. 160):—

Sessile, very small, 0.15–0.5 mm., thin, cupuliform with an inrolled margin and globose in dry times, pure white, villose or bristling; hymenium smooth, white. Hyphae generally indistinct, 1–4 μ diam.; hairs of the cuple 40–100 \times 3–4 μ , thickwalled, pointed, rarely septate, asperulate in the upper parts; basidia 15–26 \times 5–8 μ , with 2–4 sterigmata up to 2–3 μ long. Spores oblong or amygdaliform, rather variable, 5–10 \times 3–4 μ .

Cyphella tabacina Cooke & Phil. (!) apud Cooke in Grev. 10 (1882) 123; Saccardo Syll. Fung. 6 (1888) 672; van der Byl in Ann. Univ. Stellenbosch 7 (1929) 12; Doidge loc. cit. p. 484.

FIG. 10.

= *Cyphella variolosa* Kalchbr. (!). See next entry.

Cyphella variolosa Kalchbr. (!) in Grevillea 10 (1882) 104; Saccardo Syll. Fung. 6 (1888) 671; Doidge loc. cit. p. 484.

Cyphella tabacina Cooke & Phil. (!) apud Cooke in Grev. 10 (1882) 123; Saccardo Syll. Fung. 6 (1888) 472; van der Byl in Ann. Univ. Stellenbosch 7 (1929) 12; Doidge loc. cit. p. 484.

Cyphella fulvodisca Cooke & Massee (!) in Grev. 18 (1890) 50; Scott Elliot in Hedwigia 29 (1890) 66, Tab. 1; van der Byl in Ann. Univ. Stellenbosch 7 (1929) 11; Saccardo Syll. Fung. 9 (1891) 247; Doidge loc. cit. p. 483.

FIG. 9.

Fructifications cupular, urceolate to hemispherical, subsessile or shortly stipitate, up to 2 mm. diam. when moist, 0.3–0.7 mm. diam. when dry; the margin entire, rolled inwards irregularly when dry. Cupules gregarious, seated upon a red-brown subiculum which may be thick, scanty or absent, exterior white or greyish, mealy, composed of mineral matter and very short hairs. Hymenium drying tawny to olivaceous.

Basidia: cylindric-clavate, with 4 sterigmata, $4.2-8 \times 23-40 \mu$, with basal clamps. Spores: abundant, coloured, pale yellow-brown, broad elliptic, ovate or broad fusoid, with one to several guttules and a minute apiculus, $4.8-6.4 \times 7.3-9.6 \mu$.

Hyphae: hyaline, $1.6-2.4 \mu$ diam., septate, with clamps, branched, thinwalled.

Hairs of cupule: pale yellow-brown, thin- to thickwalled, the wall sometimes minutely roughened, more or less cylindrical to fusoid, sometimes with a basal clamp, $3.5-5-(7) \times 35-58 \mu$.

Subiculum: absent, scanty or well developed, reddy-brown to chocolate coloured, shortly velutinate, composed of branched, interwoven, repent hyphae, pale coloured to yellow-brown, thickwalled with occasional clamps, $2.4-6.4 \mu$ wide, terminating in more or less erect hairlike hyphae $3-5-6.4 \mu$ wide and $64-120 \mu$ long.

Specimens examined: As *C. variolosa*: Type, MacOwan (1381) ex Herb. Kalchbr. in Herb. Kew and sub No. 20939 in Pretoria; 40924, Talbot, on *Populus deltoides*, Piet Retief, Tvl.; As *C. tabacina*: Type, 11146, J. M. Wood (524) and in Herb. Kew.; As *C. fulvodisca*: Type, Scott Elliot, Fort Dauphin, Madagascar, in Herb. Kew; Farquharson (53), S. Nigeria, in Herb. Kew; Dummer (4158) and (1157), Uganda, in Herb. Kew; 35563, Rump (753), Newsel Beach, Natal; 12017, Dummer (1157), Uganda.

A close comparison of the types of *C. variolosa*, *C. tabacina* and *C. fulvodisca* leads me to believe that they are all the same species. The absence of a subiculum in the type of *C. variolosa* is not regarded as an important distinction; for in *C. tabacina*, the species in which the subiculum is best developed, there are parts almost devoid of it, while in *C. fulvodisca* the subiculum is thin and scanty and sometimes hardly distinguishable. The size of the cupules in all three species is variable, as also are their stipes. *C. fulvodisca* tends to be sessile, but cupules showing a short stipe are present. In *C. tabacina* the stipes are short while in *C. variolosa* they are comparatively long. The only specimens of *C. tabacina* and *C. variolosa* are their types. The author believes that they are merely developmental stages in a species which is most widely represented by the stage which received the name *C. fulvodisca*. In microscopic characters all three species are a close match, as is shown in Table 1.

TABLE 1.

Species.	Basidia, Size in μ .	Spores, Size in μ .	Hairs, Size in μ .
<i>C. variolosa</i>	$6.6-7.2 \times 23-26$	$4.8-6.4 \times 8-9.6$	$35-58 \times 4.5-6$
<i>C. tabacina</i>	$6-8 \times 25-40$	$4.8-6.4 \times 7.2-9.6$	$38-56 \times 4-7$
<i>C. fulvodisca</i>	$4.2-5 \times 26$	$4.8-6 \times 6.4-8.8$	$44-52 \times 3.5-4.8$

In microscopic characters *C. pelargonii* and *C. variolosa* are very close, and it is possible that they are synonymous, in which case the former name would have priority. With only one specimen for examination it is difficult to assess how far the greater cupular size of *C. pelargonii* may be reconciled with the known variation in this feature in *C. variolosa*. I have differentiated the two here on account of the greater size of the cupules in *C. pelargonii* and because its hyphae are thickwalled and commonly wider than those of *C. variolosa*.

CYPHELLA SPECIES INSUFFICIENTLY KNOWN.

(1) The species recorded by Kalchbrenner as *Cyphella friesii* Quél. See p. 473, and Fig. 20.

(2) The species represented by the type of *Femsjonina natalensis* Cooke (in Grevillea. 10, 1882, 123). This is cited by Saccardo Syll. Fung. 6 (1888) 780, and by Doidge loc. cit. p. 477. See Fig. 19.

The type, No. 11047 (*J. M. Wood*, 476) has been examined and is certainly not one of the Dacryomycetaceae. It seems referable to *Cyphella*, but owing to lack of spores (also mentioned by Cooke) and difficulty in interpreting some other structures it is not considered sufficiently well characterised to be included in the known species of *Cyphella*.

The cupules are yellowish drying light orange-yellow, 0.3–0.6 mm. diam. when dry (0.5–1 mm. fide Cooke), somewhat fleshy-gelatinous in texture, sessile, discrete but occurring on a floccose to pruinose greyish-white subiculum. The cupules are wide open, their exterior being glabrous or covered with a fine scanty meal. In the hymenium are clavate organs 25–35 × 6.4–8.5 μ of the appearance of basidia, also clavate organs 13–18 × 3.5–5.5 μ again like basidia. No sterigmata or spores were seen. Also in the hymenium were ovate vesicular bodies, 10–15 × 15–23 μ, whose nature and origin could not be made out. The hyphae were hyaline, subgelatinous, with clamps, thinwalled, 1.8–3 μ wide. The subiculum was composed of scanty hyaline hyphae, thinwalled, 2.8–3.2 μ diam., surrounded by heavy deposits of minerals.

CYTIDIA Quélet.

Cytidia cornea Lloyd (!) in Lloyd Myc. Notes 5 (1917) 656, figs. 935–937; Doidge loc. cit. p. 484.

The author has examined the type of this species (*Duthie* 154, in Lloyd Mycological Collections No. 34063) and concludes with Martin (in Lloydia 5, 1942, 161) and W. B. Cooke (in Mycologia 43, 1951, 208) that it must be referred to *Cytidia habgallae* (Berk. & Br.) Martin.

Cytidia flocculenta (Fr.) Höhnelt & Litsch. in K. Akad. Wiss. Wien Sitzungsab. 116 (1907) 758; Burt in Ann. Mo. Bot. Gard. 11 (1924) 9, Pl. 1, f. 7; W. B. Cooke in Mycologia 43 (1951) 204; Doidge loc. cit. p. 484.

Thelephora flocculenta Fries, Elenchus Fung. 1 (1828) 184.

Corticium flocculentum Fries, Epicrasis (1838) 559, Hym. Eur. (1874) 647.

Cyphella ampla Lév. in Ann. Sci. Nat. ser. iii, 9 (1848) 126.

Further synonyms are given by W. B. Cooke, loc. cit.

FIG. 16.

Fructifications discoid to shallow cupular, membranous-gelatinous in texture, up to 1.5 cm. diam., sessile, attached more or less centrally; surface greyish-white, hairy, with a floccose tomentum composed of hyaline hyphae united into fascicles, without much mineral matter. Hymenium smooth, but usually with a few prominent veins, coloured fawn to reddish brown, darkening on drying to a dull reddy-black. Thickness in section excluding tomentum about 700 μ.

Basidia: 30–(40) × 4–5 μ, cylindrical to clavate.

Spores: hyaline, smooth, cylindrical to allantoid, 1.5–3 × 7–10 μ.

Hyphae: gelatinised, thickwalled, usually only the lumen showing clearly, with numerous clamp connections, much branched and anastomosed, 1–3 μ diam.

Tissue differentiation: a dark compact zone subtends the surface hairs.

Hairs: thickwalled, unbranched, without septa or clamps, hyaline, sometimes a faint straw colour, 4–5 μ diam.

Specimens examined: Universiteit van Stellenbosch, Herbarium P. A. van der Byl nr. 2524 (as *Cyphella alboviolascens*); 39103, van Hoepen, on *Populus*; 28804, Doidge & Bottomley, on *Populus*; 27569, Louwrens; 32505, Jacot-Guillarmod; 24852, on *Quercus*; 23719, Reinecke; 40474, Talbot.

Cytidia habgallae (Berk. & Br.) Martin in Lloydia 5 (1942) 161, figs. 4–12; W. B. Cooke in Mycologia 43 (1951) 208; Doidge loc. cit. p. 484.

Corticium habgallae Berk. & Br. in Journ. Linn. Soc. Bot. 14 (1873) 72.

Cytidia cornea Lloyd (!) in Lloyd Myc. Notes 4 (1917) 656, figs. 935–937.

Aleurodiscus corneus (Lloyd) Lloyd (!) in Lloyd Myc. Notes 6 (1920) 930, f. 1688.

Aleurodiscus capensis Lloyd (!) in Lloyd Myc. Notes 6 (1920) 930, f. 1687, *ibid.* 6 (1921) 1088; Stevenson & Cash in Bull. Lloyd Library No. 35 (1936) 43.

Gloeosoma capensis Lloyd (!) (as McGinty) *nomen provisorium* in Lloyd Myc. No. 6 (1921) 1088; Stevenson & Cash in Bull. Lloyd Library No. 35 (1936) 42.

Aleurocystus capensis Lloyd (!) (as McGinty) ex Stevenson & Cash in Bull. Lloyd Library No. 35 (1936) 42; Lloyd (as McGinty) in Lloyd Myc. Notes 6 (1921) 1088, *nomen provisorium*.

An extended synonymy is given by Martin (*loc. cit.*) and by W. B. Cooke (*loc. cit.*).

FIG. 17.

Fructifications sessile, attached by the central part to the substratum, discoid, irregularly circular with lobed, slightly upturned margin, single or confluent, coloured whitish to pale creamy or with a pinkish-buff tint when old (may become darker still, *fide* Martin). Texture fleshy-gelatinous when moist, drying ceraceous-horny. Diameter when dry 2–6 mm. Thickness in section up to 1000 μ .

Basidia: large, clavate, 10–17 \times 70–95 μ (immature) with 2–4 sterigmata up to 10 μ long and 4 μ wide at the base.

Spores: at first hyaline, thinwalled, smooth, with a prominent apiculus, ovate or broad elliptic, 15–19 \times 13–14 μ (up to 18–25 \times 10·8–18 μ , *fide* W. B. Cooke); finally the walls become thickened to as much as 2·5 μ thick and are penetrated by small peglike projections of the lumen in two (rarely more) places, one opposite the apiculus and one at the opposite pole of the spore; the thickened spores are commonly found embedded in the tissues of the fructification.

Paraphyses: accompanying the basidia, hyaline simple paraphysoids or dendrophyses with short branches, thinwalled, not encrusted, 1·5–3 μ wide and 40–60 μ long.

Cystidia: embedded or projecting above the hymenium, usually fusoid, with thin to thick walls covered with detersile pale yellowish-brown mineral granules, (8)–16–25 \times 60–100 μ .

Hyphae: smooth, hyaline, thinwalled, gelatinised, with clamp connections, 1–2 μ wide, arranged more densely towards the outer parts of the fructification.

Specimens examined: A. V. Duthie 154 (Lloyd Mycol. Collections No. 34063), type of *Cytidia cornea*; P. A. van der Byl 833 (Lloyd Myc. Coll. No. 34029), type of *Aleurodiscus capensis*; 23490, F. Eyles (675), Mazoe, S.R.

The cystidia and the presence of peculiarly thickened basidiospores characterise this species. According to Martin (l.c.) the imperfect state of this fungus is represented by *Matula poroniaeformis* (B. & Br.) Masee and *M. rompelii* (Rick) Lloyd.

Cytidia simulans Lloyd (!) in Lloyd Myc. Notes 6 (1920) 991, f. 1772; Doidge loc. cit. p. 484; W. B. Cooke in Mycologia 43 (1951) 207.

FIG. 18.

Fructifications discoid, centrally attached, sessile, 1-1.5 cm. diam., with a fleshy-gelatinous texture; hymenium smooth but bearing small wrinkles, pale brown; surface white, bearing a few hyaline hairs encrusted heavily with mineral granules and thus appearing pruinose.

Basidia: cylindric-clavate, $20-35 \times 3-4.5 \mu$, with (fide W. B. Cooke) 2 or 4 sterigmata.

Spores: of two kinds (1) abundant, small, hyaline, smooth, cylindrical or allantoid, $2-2.5-(3.2) \times 6.4-9.6-(11.2) \mu$, borne on the basidia with four sterigmata, (2) scanty, larger, hyaline, smooth, ovate to elliptic-depressed, $4.8-6.4 \times 9.6-12.8 \mu$, borne on basidia with two sterigmata.

Hyphae: hyaline, more or less thickwalled with only the lumen showing clearly, gelatinised, with numerous clamp connections, much contorted and sometimes undulating, $1.5-3 \mu$ diam., branched and anastomosed.

Specimens examined: Type, *A. V. Duthie* 243, in Lloyd Myc. Coll. No. 33589.

The larger spores are not easy to find in the type, and only, material of this species, while the smaller spores are much like those of *Cytidia flocculenta*. The latter may be distinguished by its long floccose hairs on the surface, where *C. simulans* has only a few short hairs and derives its white, pruinose appearance from the mineral granules encrusting its surface.

DENDROTHELE Höhnelt & Litsch.

Dendrothele duthieae sp. nov.

FIG. 22.

Fructifications resupinate with a narrowly upturned margin, not firmly adnate, discoid, up to 5 mm. diam., or elongated-confluent, bearing on the hymenium white papillae (hyphal pegs) visible to the naked eye, emerging from a whitish to pale tan coloured hymenium; texture pellicular, the hymenium being membranous and the basal tissues very soft and byssoid.

Basidia: long, clavate, with a wavy outline, often with a basal clamp, $50-110 \times 10-14 \mu$, with four sterigmata.

Spores: hyaline, smooth, pip-shaped or ovate-elliptical to long-elliptical with the attached end narrowed to a prominent apiculus and commonly curved, not amyloid, abundant, $8-9.6-(11.2) \times (15)-17-19-(22) \mu$.

Hyphal pegs: abundant, visible to the naked eye, white, superficial, i.e. easily detached and leaving a crater when removed, composed of dendrophytic hyphae with short, irregular branches, heavily encrusted with minerals, often showing a clamp near the base of the main axis, $1.5-3.5 \mu$ diam., with firm walls. Hyphal pegs sterile.

Paraphyses: in the hymenium are dendrophyses like those of the hyphal pegs, and aborted basidia, some with a tendency to fork and others with vague submoniliform constrictions.

Hyphae: basal hyphae loosely, horizontally interwoven, byssoid, hyaline, septate, branches, with numerous clamps and with thin, firm walls and a wide lumen, about 3.2μ wide. The hymenium and subhymenial layers contain much mineral matter. Specimens examined: Type, No. 31393, *A. V. Duthie* (187), without locality but probably Knysna area.

The spores of this species have a distinctive apiculus which remains uncoloured by phloxine stain and is easily picked out. It is possible that hyphal pegs are not always produced in this species, but on the basis of the present specimen it must be disposed in *Dendrothele* rather than *Aleurodiscus*.

Dendrothele duthieae sp. nov.

Fructificationes resupinati, discoidales, usque ad 5 mm. diam., elongato-confluentes. Margines minute revolutae. Hymenium albicans vel dilute alutaceum, minute albobapillosum. Textura pellicularis. Basidia clavata, 50–110 × 10–14 μ . Sporae hyalinae, laeves, amygdaliformes vel ovato-ellipticae, haud amyloidae, (15)–17–19–(22) × 8–9·6–(11·2) μ . Papillae steriles, oculo nudo conspicuae, superficiales, ex hyphis dendrophyticis et corporibus mineralibus compositae. Paraphysae (1) dendrophyticae (2) basidia abortiva, nonnulla submoniliforme constricta. Hyphae basales laxae intertextae, hyalinae, septatae, nodoso-septatae, ramosae, tenue tunicatae. Typus: No. 31393, leg. A. V. Duthie (187).

GLOEOSOMA Bresadola.

Gloeosoma capensis Lloyd (as McGinty) (!) in Lloyd Myc. Notes 6 (1921) 1088, *nomen provisiorum*. Further referred to in: Stevenson & Cash in Bull. Lloyd Library No. 25 (1936) 42; Martin in Lloydia 5 (1942) 162.

At the same time suggesting a new genus, *Aleurocystus*, to accommodate *Aleurodiscus capensis*, Lloyd (loc. cit.) proposed that the latter might also be transferred to the genus *Gloeosoma*. The arguments given under *Aleurocystus*, apply here as well, and one concludes that *Gloeosoma capensis* is also a *nomen provisiorum* and was not validly published. See under *Cytidia habgallae* (B. & Br.) Martin.

POROTHELEUM (Fr. ex Fr.) Fr.

Porotheleum incanum (Kalchbr.) Saccardo, Syll. Fung. 6 (1888) 423.

Stigmatolemma incanum Kalchbr. in Grevillea 10 (1882) 104; Doidge loc. cit. p. 544 (as *Stigmatolemina incanum*).

FIG. 21.

Fructifications composed of sessile cup-shaped fruit-bodies very closely aggregated and confluent, at first closed, later opening and showing the hymenium lining the interior of each cupule. The cupules are all seated on a white subiculum which projects as a white, very narrow, byssoid margin beyond the aggregate fructification. Walls of cupules are grey, i.e. light cinereous in colour giving the whole a light grey appearance, and are shortly byssoid on the exterior. Hymenium very dark, almost black when dry. Occupying areas several cm. long and 1–2 cm. wide on bark and wood. Diameter of the cupules \pm 325 μ .

Basidia: clavate, 16·6–25·6 × 7·2–9·6 μ , often with a large apical guttule. Sterigmata 2–4, conical, stout, 1·6 μ long. Basidia are formed in clusters and show occasional basal clamps.

Spores: hyaline, smooth, cylindrical with one side depressed, or occasionally seen as broad elliptical, 7·2–8 × 3·2–4·4 μ , abundant.

Hyphae: of the cupules and the subiculum are hyaline, very narrow, up to 1·6 μ diam., branched, with clamp connections, smooth in the cupules but often coated with very fine mineral matter in the subiculum.

Specimens examined: No. 31058 (b), A. M. Bottomley, dead wood, Knysna, 1939.

In the original description of *Stigmatolemma incanum* the spores are said to be $15\ \mu$ long. The author had been unable to trace authentic material of this species and was about to propose a new species for No. 31058 (*b*) based on the difference in spore size, when Dr. Wm. Bridge Cooke kindly informed him that there was apparently type material of *S. incanum*, ex Herb. Karsten, preserved in the Lloyd collections sub No. 17601 in the U.S. National Fungus Collections. Dr. Cooke states that this specimen, collected by MacOwan at Somerset East, has spores measuring $7 \times 4\ \mu$. It therefore corresponds very well with Miss Bottomley's new collection.

In using the generic name *Porotheleum*, I have not overlooked Donk's argument (in Reinwardtia 1, 1951, 217–218) that *Porotheleum* Fr. (later spelled *Porothelium* by Fries himself) is a later homonym of *Porothelium* Eschweiler, and so should be replaced by *Stromatoscypha* Donk (1951, loc. cit.). An alternative interpretation of the facts and Code of Nomenclature has been suggested to me by Dr. Cooke in a private communication. I feel that a full statement must await Dr. Cooke's own publication on this group and that meanwhile it would be inadvisable to make a new combination of *P. incanum* under *Stromatoscypha*.

SOLENIA Pers. ex Fr.

Solenia candida Persoon in Roemer Neues Mag. Bot. 1 (1794) 116, Syn. Fung. (1801) 676, Myc. Eur. 1 (1822) 334; Fries, Syst. Myc. 2 (1823) 200; Saccardo Syll. Fung. 6 (1888) 424; Doidge loc. cit. p. 487.

This record rests on the specimen cited by Doidge, 28297, *W. G. Rump* (223), in the National Herbarium, which is the type specimen of *Solenia natalensis* W. B. Cooke sp. nov.

Solenia minima Cooke & Phil. (!) apud Cooke in Grevillea 10 (1882) 123; Saccardo Syll. Fung. 9 (1891) 207; Doidge loc. cit. p. 487.

FIG. 15.

Cupules delicate, membranous, sessile, whitish to pale lemon yellow when dry, short-cylindrical to barrel-shaped, discrete but gregarious, small, $250\ \mu$ high, $130\ \mu$ diam.

Basidia: clavate, $16-19 \times 4.8-6\ \mu$.

Spores: hyaline, smooth, subglobose to broad ovate, $2.5-3 \times 3-4\ \mu$.

Hyphae: hyaline, rather indistinct, about $1.6\ \mu$ diam., no clamps seen.

Specimens examined: Type, *Wood* (482), on *Strelitzia*, Inanda, under Nos. 10706 and 11145 in National Herb., Pretoria, and specimen in Kew.

The species is distinguished by its very small, subcylindrical, sessile cupules, which are yellowish when dry, and lack surface hairs.

Solenia natalensis W. B. Cooke sp. nov.

Receptacles cylindrical, 0.5 mm. tall at margins of colony, separate, in centre of fruiting area up to 1.0–1.5 mm. tall, sometimes up to 2 mm., becoming densely gregarious, apparently adnate in sheaths; subiculum evanescent or absent, not evident; surface hairs when present strongly appressed, up to $3\ \mu$ in diameter, with thick walls, the outer half in the shape of a medium to tight spiral, mostly toward the upper part of the receptacle; toward the lower part scattered, hyaline, thick-walled, branched hyphae occur; context hyphae $2.0-2.5\ \mu$, up to $3.5\ \mu$ in diameter, simple septate and with clamp connections; hymenium formed of a tight palisade of basidia; basidia with basal clamps, mostly $12.5 \times 5.5\ \mu$, 4-sterigmate; spores hyaline, ovate, apiculate, smooth, somewhat flattened on one side, $3-4 \times 2.5-3.5\ \mu$.

Hab.: on indigenous wood.

Type: Town Bush, Pietermaritzburg, Natal, Union of South Africa, Coll. *W. G. Rump* (223), Oct. 1934 (Pretoria 28297).

This specimen was determined originally as *Solenia candida*. It can be distinguished from that species by its smaller, ovate spores and its surface hairs which are spiral in the outer half rather than dichophysoid. Its marginal cupules resemble superficially those of *S. candida* while those in the centre of a colony appear like those of the variety *polyporoidea*. On examination the adjacent cupules are not grown together, which would be the case if the cupules were truly adnate, and are not damaged when separated in mounting.

Solenia natalensis W. B. Cooke sp. nov.

Receptacula cylindracea, 0.5–2 mm. alta, separata deinde dense gregaria, adnata. Subiculum fugiens vel absens, non manifestum. Pili superficiei plerumque versu, partem superam receptaculi, forte appressi, usque ad 3 μ diam., crasse tunicatis dimidiis extremis in helicem glomeratis; hyphae hyalinae, crasse tunicatae, ramosae plerumque ex parte inferiore receptaculi orientes. Hyphae contextae 2.0–2.5 μ , usque ad 3.5 μ diam., vel septatae vel nodoso-septatae. Basidia 12.5 \times 5.5 μ , infra nodulis, sterigmatibus 4. Sporae hyalinae, ovatae, apiculatae, leves, uno latere compressae, 3.4 \times 2.5–3.5 μ . Typus No. 28297, leg. *W. G. Rump* (223).

Solenia rhoina W. B. Cooke sp. nov.

Receptacles densely crowded in definite areas, with a thin layer of arachnoid subicular hyphae on substratum where cups do not occur; receptacles up to 0.5 mm. in diameter, sessile, broad cupulate, cream-colour when dry; margin entire, silky, appearing like a minute *Stereum*; context very thin, the several layers of hyphae giving rise on the one hand to surface hairs, on the other to basidia; surface hairs hyaline, solid, parallel, appressed, progressively shorter to the margin, less appressed near the base, 25–75 \times 2.5–4.0 μ ; hymenium of tightly packed basidia each with a basal clamp, 4-sterigmate, 14.5–18 \times 5–7 μ ; spores smooth, hyaline, ovate, apiculate, flattened on one side, 6–7.5 \times 4.5–5.5 μ .

Hab.: on *Rhus lancea* (Karoo-boom).

Type: Hennops River, Pretoria District, Union of South Africa, collected by *P. H. B. Talbot*, Aug. 15, 1948. (Pretoria 39049).

This species is distinct from other species in the genus. The subiculum is *Solenia*-like rather than *Porotheleum*-like, but the colonies are as discrete as in some species in that genus.

Solenia rhoina W. B. Cooke sp. nov.

Receptacula usque ad 0.5 mm. diam., in locis definitis dense conferta, sessilia, cupulata, cremicolora. Subiculum tenue, arachnoideum. Margo integer, bombycinus. Contextus tenuissimus. Pili superficiei hyalini, solidi, appressi, paralleli, versus marginem breviores, 25–75 \times 2.5–4.0 μ . Basidia infra nodulis, sterigmatibus 4, 14.5–18 \times 5–7 μ . Sporae hyalinae, leves, ovatae, apiculatae, uno latere compressae, 6–7.5 \times 4.5–5.5 μ . Typus No. 39049, in ramo arboris quae *Rhus lancea* appellatur, leg. *P. H. B. Talbot*.

STIGMATOLEMMA Kalchbrenner.

Stigmatolemma incanum Kalchbr. in Grevillea 10 (1882) 104; Doidge loc. cit. p. 544 (as *Stigmatolemina incanum*).

= *Porotheleum incanum* (Kalchbr.) Sacc.

Keys to Accepted Species.

Aleurodiscus.

1. Both yellowish gloeocystidia and encrusted dendrophyses present together. Amyloid granules encrusting the dendrophyses. Spores broad elliptic to ovate, $13.5-15 \times 7.5-8 \mu$.
A. botryosus. 2.
 Either gloeocystidia or dendrophyses present, or both absent. Spores otherwise. 2.
2. Spores semilunate, biapiculate, smooth or minutely echinate, about $14 \times 23 \mu$. Acanthophyses and simple unbranched paraphysoids present.
A. mirabilis. 3.
 Spores otherwise. 3.
3. Fructifications whitish or light-coloured but not rosy, purplish, violet, lilac or brownish to clay-coloured. 4.
 Fructifications rosy, purplish violet, lilac, brownish to clay-coloured. 6.
4. Spores ovate-subglobose, $18-22 \times 12.5-16 \mu$. Simple cylindrical paraphysoids and gloeocystidioid submoniliform paraphysoids present.
A. disciformis. 5.
 Spores not more than 8μ broad. Encrusted dendrophyses and bulbous pseudophyses with a short to long apical outgrowth present. 5.
5. (Spores ovoid, $5.6-6.4 \times 8-12 \mu$, ratio length/width less than 2.0. *A. acerinus.*)
 Spores broad elliptic to ovate, $4-8 \times 9-17.6 \mu$, ratio length/width more than 2.0.
A. acerinus var. *alliaceus.*
6. Fructifications rose coloured, paling to a fleshy tint on storage. *A. roseus.*
 Fructifications purplish, violet, lilac or partly changing to brown or clay colour.
A. polygonioides.

Cyphella.

1. Fructifications cupulate, sessile or shortly stalked. 2.
 Fructifications discoid with reflexed margin (i.e. saucer-shaped). Encrusted, villose hairs on reflexed part. Spores cylindrical, straight or curved, $3.2-4.8 \times (6.4)-8-11 \mu$.
C. applanata.
2. Fructifications villose with long hairs on the exterior. 3.
 Fructifications pruinose with short, sparse hairs or mineral encrustations, or nude. 4.
3. Spores smooth, broad ovate to pip-shaped, $11.2-14.4 \times 9-9.6-(11.6) \mu$. Cupules 1-3 mm. diam.
C. alboviolascens.
 Spores finely asperulate, ovoid, $12-15 \times 7-8 \mu$. Cupules 1 mm. diam., then becoming flattened.
C. cheesmani.
4. Spores hyaline, ovate to subglobose, $4.8-6.4 \mu$ diam., smooth or very minutely punctate. Cupules 0.3-1.5 mm. diam., not hairy, pruinose with mineral deposits. *C. farinacea.*
 Spores lightly coloured, cupules with sparse, short hairs on exterior. 5.
5. Cupules up to 1000μ high, lacking a subiculum. Hyphae thickwalled, $3.4-8-(6.4) \mu$ wide.
C. pelargonii.
 Cupules up to 600μ high, commonly seated on a reddy-brown subiculum which may be scanty or absent. Hyphae thinwalled, $1.6-2.4 \mu$ wide.
C. variolosa.

Cytidia.

1. Spores large, ovate or broad elliptical, at first hyaline, later pale coloured with the wall thickening to 2.5μ and penetrated by peglike projections of the lumen. Fusoid, encrusted cystidia present.
C. habgallae. 2.
 Spores otherwise. Cystidia absent. 2.
2. Spores of one kind only, cylindrical to allantoid, $1.5-3 \times 7-10 \mu$. Cupular hairs long and floccose.
C. flocculenta.
 Spores of two kinds (a) cylindrical or allantoid, $2.2-5-(3.2) \times 6.4-9.6-(11.2) \mu$, (b) ovate to elliptic-depressed, $4.8-6.4 \times 9.6-12.8 \mu$. Cupular hairs short and scanty.
C. simulans.

Solenia.

1. Cupules $170-250 \mu$ diam., 1 mm. long; creamy when dry, with spiral surface hairs in the outer half.
S. natalensis.
 Cupules 130μ diam., 250μ long; yellowish when dry, lacking surface hairs.
S. minima.
 Cupules up to 500μ diam., creamy yellow, with solid parallel surface hairs.
S. rhoina.

Explanation of the Illustrations.

Throughout the illustrations the following symbols apply:—

A = Acanthophyses.	HA = Habit.
B = Basidia.	P = Pseudophyses.
C = Cystidia.	S = Spores.
D = Dendrophyses.	SE = Section.
G = Gloeocystidia.	SH = Surface hairs.
H = Hyphae.	

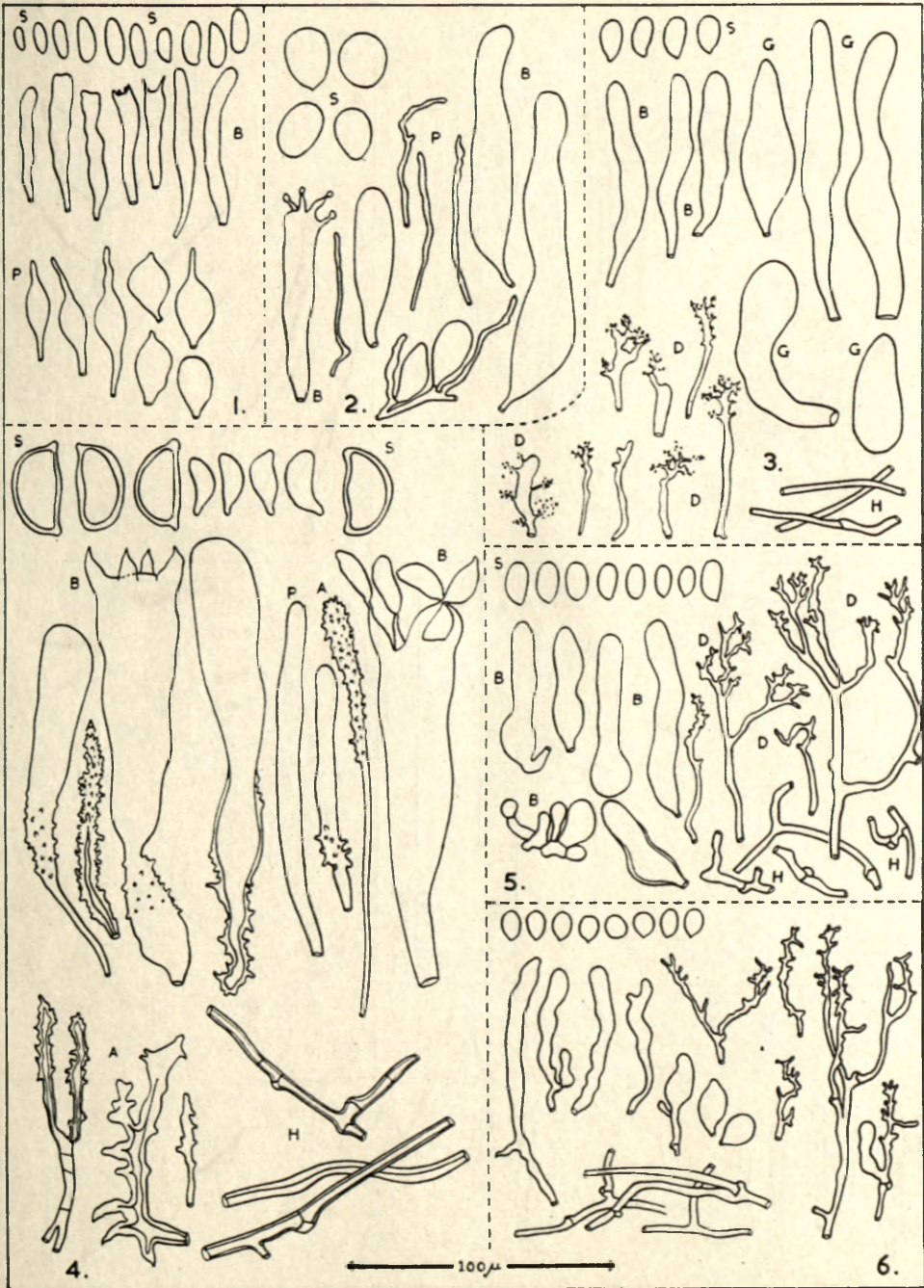


FIG. 1.—*Aleurodiscus acerinus* var. *alliaceus* drawn from the type of *A. acerinus* var. *longisporus*; FIG. 2.—*Aleurodiscus disciformis*; FIG. 3.—*Aleurodiscus botryosus*; FIG. 4.—*Aleurodiscus mirabilis*; FIG. 5.—*Aleurodiscus polygonioides*; FIG. 6.—*Aleurodiscus roseus*.

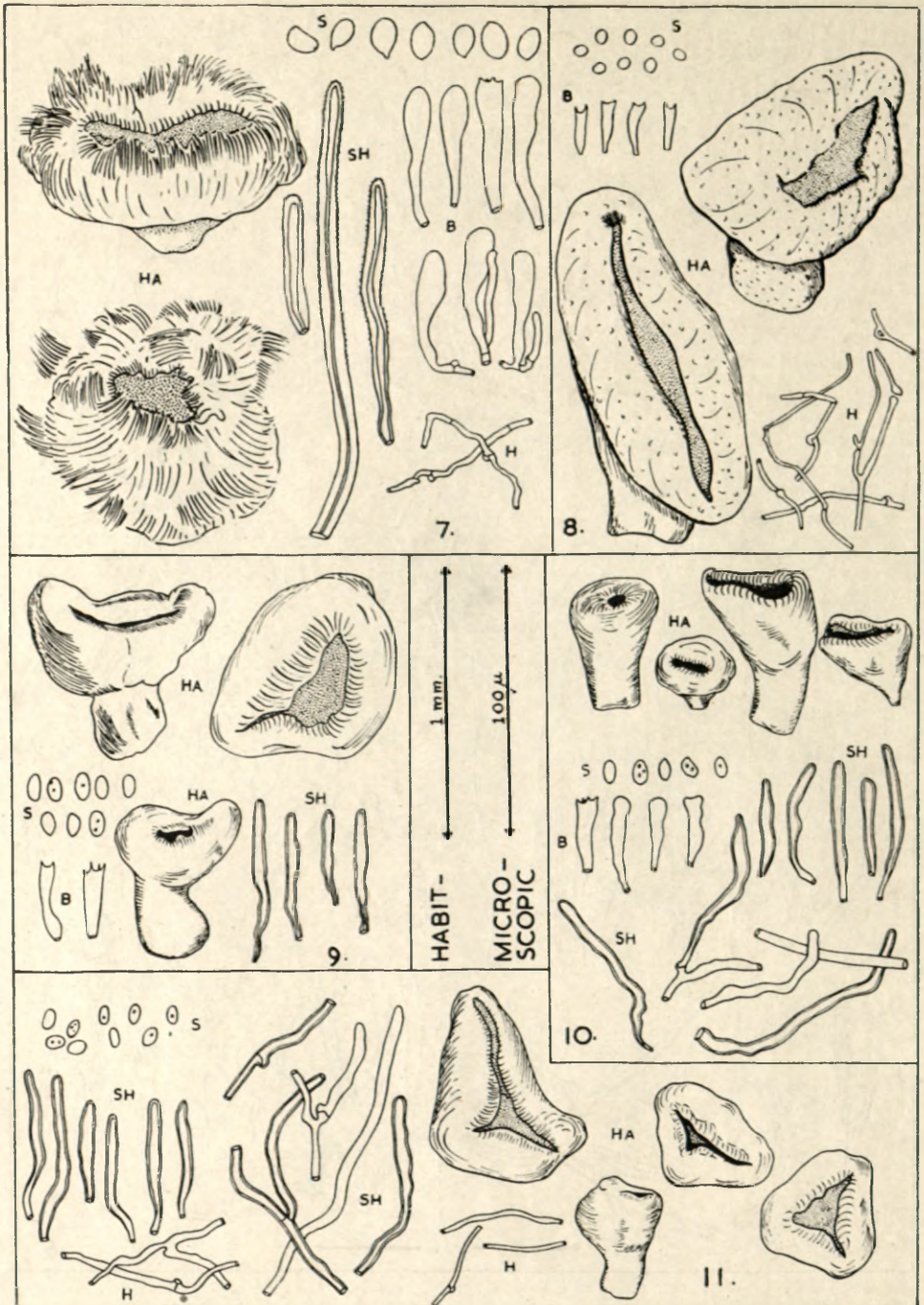


FIG. 7.—*Cyphella albviolascens*; FIG. 8.—*Cyphella farinacea*, from the type; FIG. 9.—*Cyphella variolosa*, from the type; FIG. 10.—*Cyphella tabacina*, from the type; FIG. 11.—*Cyphella fulvodisca*.

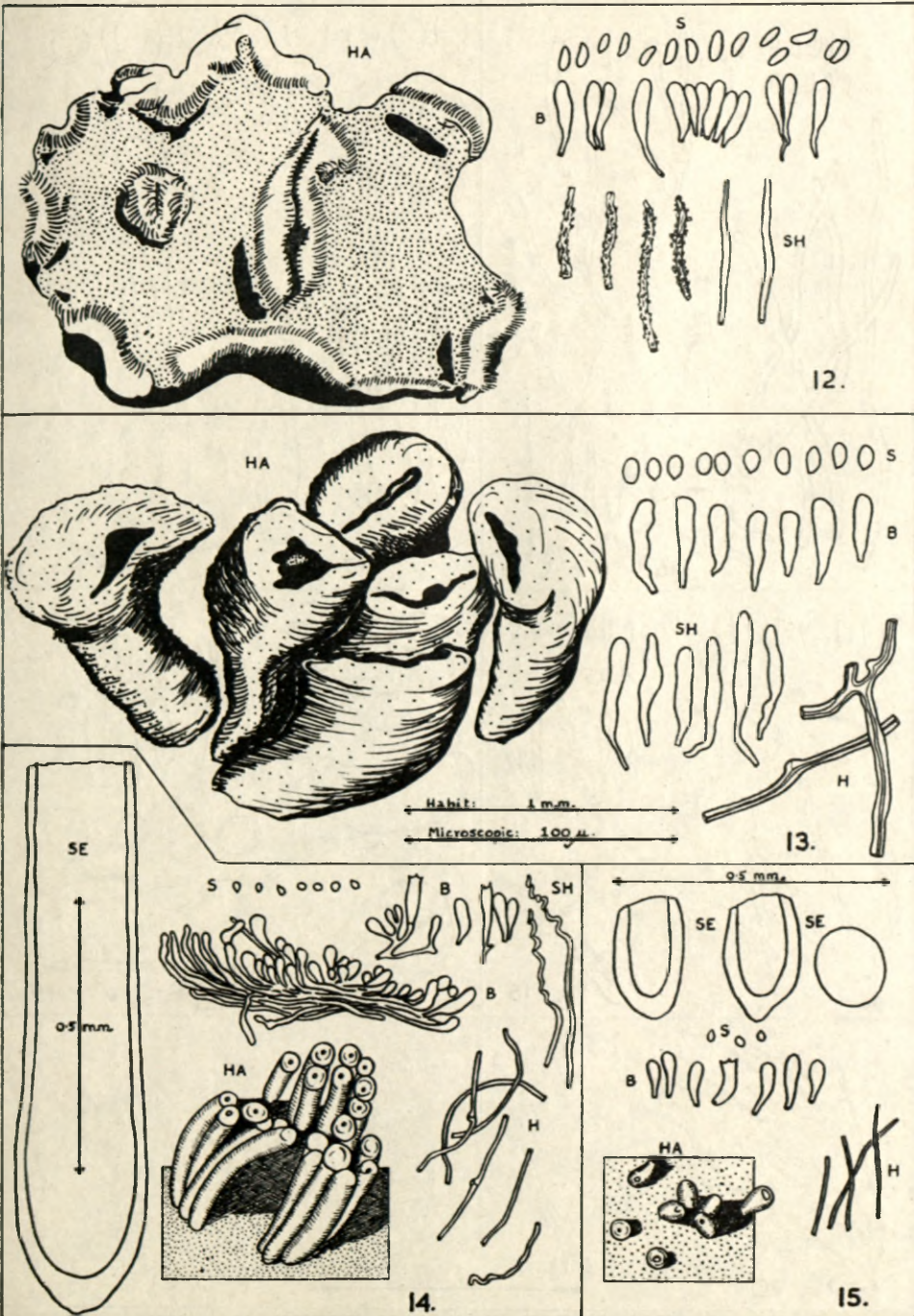


FIG. 12.—*Cyphella, applanata* from the type; FIG. 13.—*Cyphella pelargonii*, from the type; FIG. 14.—*Solenia natalensis*, from the type; FIG. 15.—*Solenia minima*, from the type.

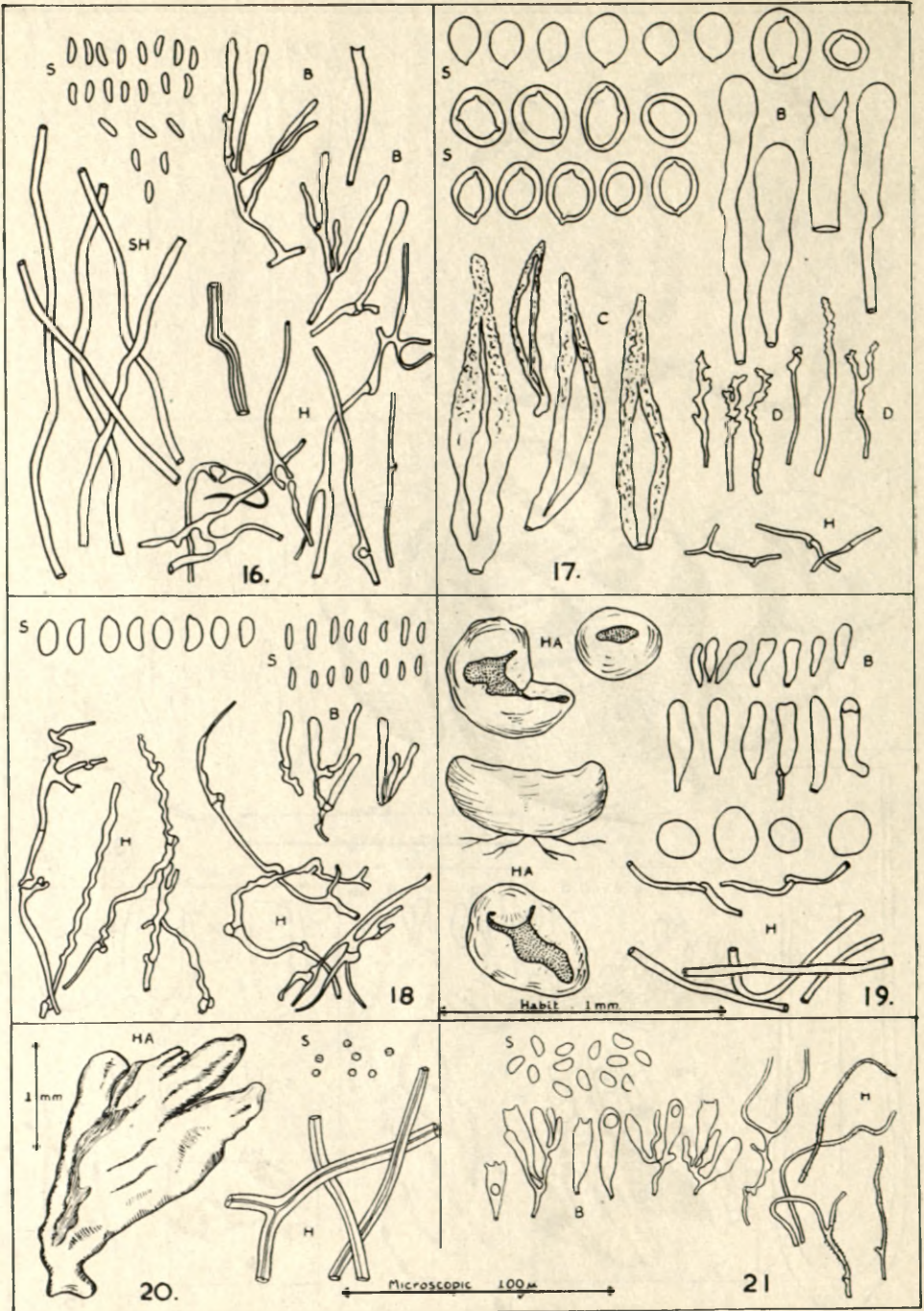


FIG. 16.—*Cytidia flocculenta*; FIG. 17.—*Cytidia habgallae*, drawn from the type of *Aleurodiscus capensis* and *Cytidia cornea*; FIG. 18.—*Cytidia simulans*, from the type; FIG. 19.—*Cyphella* sp., drawn from the type of *Femsjonia natalensis*; FIG. 20.—*Cyphella* sp., recorded by Kalchbrenner as *Cyphella friesii* Quél.; FIG. 21.—*Porotheleum incanum*.

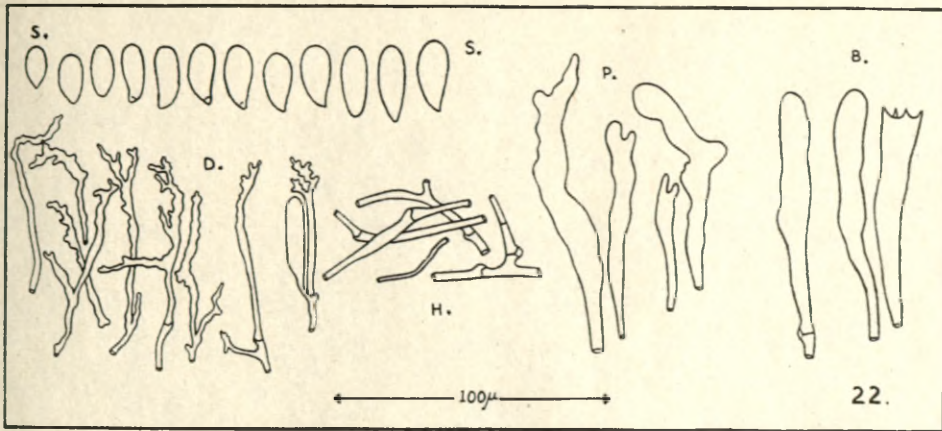


FIG. 22.—*Dendrothele duthieae*, from the type.

