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NOTES ON MICROFUNGI. II

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(With Plate 25 and 7 Text-figures)

Nine new or interesting microfungi are described with explanatory notes. Included are *Chaetochalara* gen.nov., with three new species (*C. bulbosa*, *C. africana* and *C. cladii*), and *Phragmotrichum* Kunze & Schmidt, with *P. chaillettii* Kunze, *P. karstenii* nom.nov. (syn. *Taeniophora acerina* Karst.) and *P. platanoidis* Otth.

The first paper in this series was entitled 'Notes on British Microfungi. I' (Sutton & Pirozynski, 1963). Several interesting species have been studied since, and in this account of them it has been necessary to include some which have not yet been recorded from Britain. Rather than exclude closely related non-British species it has been decided to broaden the scope of the papers and alter the title of the series to 'Notes on Microfungi'. Additions to the British fungus flora are marked with an asterisk. Unless otherwise stated, the material cited and examined was collected by the authors and is deposited in Herb. **IMI.**

*BELTRANIA RHOMBICA Penz., in *Nuovo G. bot. ital.* **14**, 72, 1882, and in *Michelia*, **2**, 474, 1882

This is an interesting record of a predominantly tropical fungus. In Europe it has so far been recorded only from Sicily. A further point of interest is that it was found on leaves of *Quercus ilex*, the type substratum of *B. querna* Harkness, described from California and more recently recorded from Italy (List of Cultures, Centraalbureau voor Schimmelcultures Baarn, 1961). As pointed out by Pirozynski (1963), these two species cannot be separated easily. That *B. rhombica* was found on *Quercus* provides additional evidence that the two may have to be merged in the future.

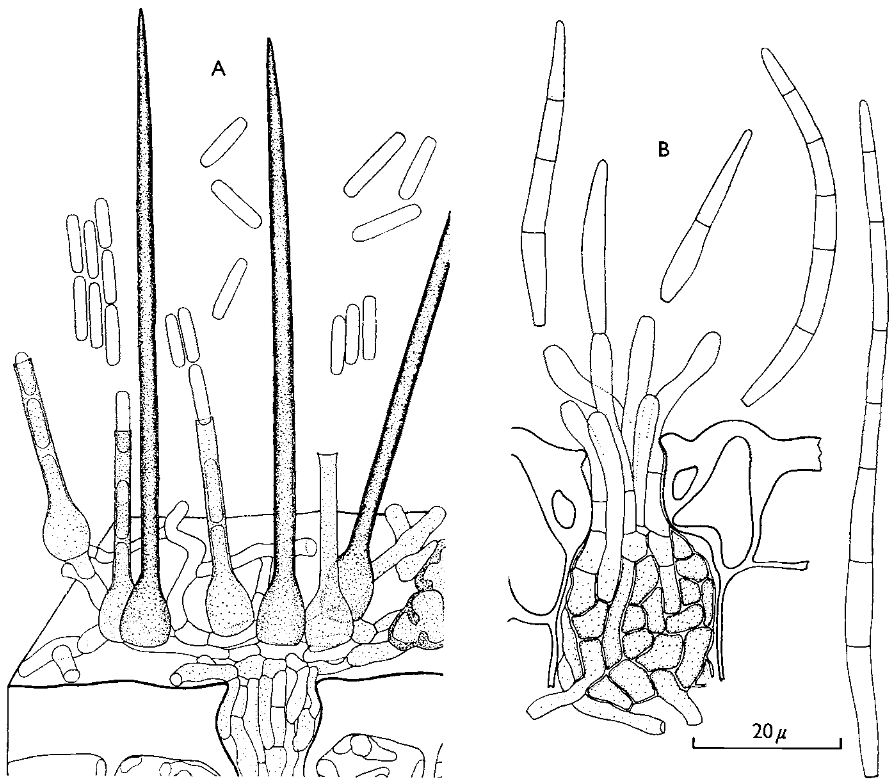
Hab. on dead leaves of *Quercus ilex*, Lydd, Kent, 9 Oct. 1963 (**IMI** 102643a).

*CERCOSPORELLA SCIRPI Moesz, in *Arbeit. ung. biol. Forsch. Inst.* **1**, 114, 1930 (Text-fig. 1B)

Spots irregular, round or elongated, up to 3 cm. long × 5 mm. wide, greyish brown, each surrounded by a diffused chlorotic halo. *Conidiophores* arising from pale brown, prosenchymatous stromata filling the substomatal cavities and emerging through stomata in dense tufts of 50–200; hyaline, thin-walled, straight, continuous, 5–15 μ long × 1·5 μ wide, with no marked terminal or lateral scars. *Conidia* hyaline, straight or curved, fusiform, 2–3·5 μ wide at the base, bearing a thickened scar, tapering gradually to a blunt apex 1·5 μ wide, continuous and about 20 μ long when young, becoming up to 10-septate and 100 μ long.

Hab. on flowering culms of *Schoenoplectus lacustris*, Old Romney, Kent, 9 Oct. 1963 (**IMI** 102596b).

Judging from the original description, this species is different from *C. scirpi* (Zaprom.) Karak. (Vassil'evsky & Karakulin, 1937). Though the fungus is not congeneric with *Cercosporella* Sacc. it is recorded here under its original name. A better genus would probably be *Cercoseptoria* Petrak, but until the generic limits have been more satisfactorily defined in this complex no redisposition is made.



Text-fig. 1. A, *Chaetochalara bulbosa*, phialospores, phialides and setae (**IMI** 89645a); B, *Cercosporella scirpi*, conidiophores and conidia.

Chaetochalara gen.nov. (Etym. *χαιτ*, seta, et *Chalara*)

Fungi Imperfecti, Hyphomycetes

Coloniae foliicolosae, brunneae vel atrae, effusae, velutinae. Mycelium partim superficiale, setas et phialides ferens, partim in substrato immersum. Setae simplices, erectae, brunneae, continuae vel septatae, acuminatae. Phialides hyalinae, brunneae, cylindraceae vel ampulliformes. Phialospora endogena in catenis sporidiis maturis apice, hyalina, cylindracea, continua vel septata.

Species typica C. bulbosa Sutton & Pirozynski.

Colonies foliicolous, effused, dark brown to black, hairy. Mycelium partly superficial, partly immersed in the substratum. Internal mycelium of hyaline hyphae often aggregated in the substomatal cavities and emerging through stomata to give rise to tufts of setae and phialides, then spreading to form a superficial network of subhyaline to brown hyphae often bearing phialides, or both setae and phialides. *Setae* simple, erect, brown, continuous or septate, thick-walled, pointed. *Phialides* colourless to brown, cylindrical to ampulliform, thin-walled. *Phialospores* endogenous, produced in basipetal chains from the base of phialides, continuous or septate, cylindrical, hyaline.

This genus, with its endogenous method of conidium formation fits section IV of Hughes's scheme (1953). It is closely related to *Sporoschisma* Berk. & Br. and *Chalara* (Corda) Rabenh., but occupies an intermediate position between the two. Sterile capitate hyphae present in *Sporoschisma* and described by Hughes (1949) could be considered analogous to setae. However, the large size of the phialides and the coloured, multiseptate conidia of *Sporoschisma* separate *Chaetochalara* from it. *Chalara*, which our fungi approach more closely in phialide and conidial characters, has neither setae nor any form of associated sterile filaments.

***Chaetochalara bulbosa** sp.nov. (Text-fig. 1 A)

Coloniae hypophyllae, effusae, atro-brunneae, velutinae. Mycelium partim superficiale, setas et phialides ferens, partim in substrato immersum. Setae simplices, erectae, atro-fulvae, crasse tunicatae, laeves, continuae, 60–90 × 2·5–3·5 μ, ex basibus bulbosis cum tunicis tenuibus 7–7·5 μ latis oriundae ad apicem obtusum vel acutum 0·5–1·5 μ latum in artius cogentes. Phialides subhyalinae vel pallido-flavae cum tunicis tenuibus 20–30 μ longae, ampulliformes, basi bulbosa, 7–7·5 μ latae, abrupte ad collum 3 μ latum in artius cogentes. Phialospora endogena in catenis sporidiis maturis apice, continua, cum tunicis tenuibus, cylindracea, hyalina, 6–12·5 × 1·5–2 μ.

Hab. in foliis emortius Ilicis aquifolii, Studland, Dorset, **IMI** 89645a Holotypus; **IMI** 86894c paratypus.

Colonies hypophyllous, effused, dark brown to black, hairy. Mycelium partly superficial, partly immersed in the substratum. Internal mycelium composed of hyaline hyphae ramifying in the mesophyll and emerging through stomata in the form of a compact plug bearing a dense tuft of phialides intermixed with setae, and giving rise to a network of superficial mycelium composed of colourless to pale brown hyphae bearing few phialides and setae. *Setae* simple, erect continuous, smooth, 60–90 μ long, 2·5–3·5 μ wide, dark yellow-brown and thick-walled except at the base which is expanded into a pale brown, thin-walled bulbous swelling 7–7·5 μ wide, tapering gradually to a blunt or pointed apex 0·5–1·5 μ wide. *Phialides* arising directly from superficial hyphae or from short basal cells, thin-walled, pale yellow-brown, ampulliform, 20–30 μ long × 7–7·5 μ wide at the bulbous base, narrowing abruptly to a cylindrical neck 3 μ wide. *Phialospores* endogenous, produced in basipetal chains from the base of phialide, thin-walled, cylindrical, hyaline, 6–12·5 × 1·5–2 μ.

Hab. on rotting leaves of *Ilex aquifolium*, Studland, Dorset, 26 May 1961, **IMI** 89645a holotype, and 27 May 1961, **IMI** 86894c paratype.

Chaetochalara africana sp.nov. (Text-fig. 2A)

Coloniae epiphyllae, effusae, atrae, velutinae. Mycelium partim superficiale, setas et phialides ferens, partim in substrato immersum. Setae simplices, erectae, atro-ferrugineae, basim 1-septatae, laeves, crasse-tunicatae, pallidiores prope cum tunicis tenioribus apices acutos versos, 90–180 μ longae, basi expansa 5·5–7 μ latae, supra 2·5–3·5 μ latae, 0·5–1 μ apice in artius cogentes. Phialides subbrunneae tunicis tenuibus, 25–40 μ longae, anguste cylindraceae, 4·5–6 μ basi latae, ad collum 2–3 μ latum sensim in artius cogentes. Phialospora endogena, in catenis sporidiis maturis apice, continua, cum tunicis tenuibus, cylindracea, hyalina, 5·5–8·5 × 1·5–2 μ.

Hab. in foliis putrescentibus Brachystegiae spiciformis, Chilanga, Zambia, A. Angus M1597, 13 May 1962, **IMI** 94904f Typus.

Colonies epiphyllous, effused, black, hairy. Mycelium partly superficial, partly immersed in the substratum. Immersed mycelium of hyaline hyphae ramifying in the mesophyll and emerging through stomata, giving rise to a dense network of superficial mycelium of pale yellow-brown hyphae bearing setae and phialides. *Setae* dark reddish-brown, simple, erect, continuous, becoming thinner-walled and paler towards pointed apex, 90–180μ long, 5·5–7μ wide at the expanded base, 2·5–3·5μ wide above, tapering to a 0·5–1μ apex. Phialides arising directly from superficial hyphae, or from short basal cells, often aggregated round a seta, thin-walled, yellow-brown, narrowly cylindrical, 25–40μ long × 4·5–6μ wide at the base, narrowing gradually to a neck 2–3μ wide. *Phialospores* endogenous, produced in basipetal chains from the base of phialide, continuous, thin-walled, cylindrical, hyaline, 5·5–8·5 × 1·5–2μ.

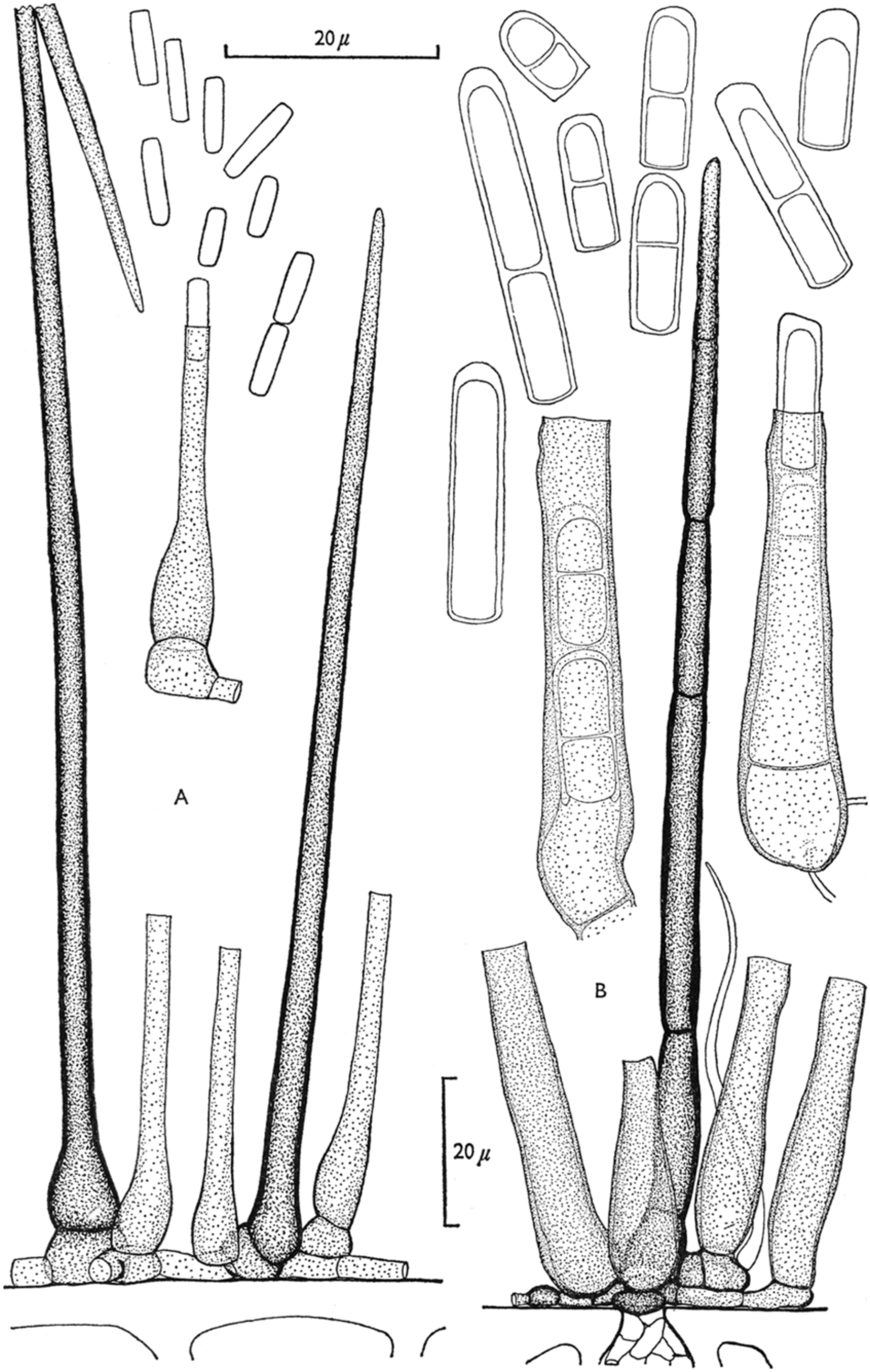
Hab. on rotting leaves of *Brachystegia spiciformis*, Mt Makulu Res. Sta., Chilanga, Zambia, A. Angus M1597, 13 May 1962, **IMI** 94904f, type.

***Chaetochalara cladii** sp.nov. (Text-fig. 2B)

Coloniae amphigenae, atro-ferrugineae, effusae, velutinae. Mycelium partim superficiale, setas et phialides ferens, partim in substrato immersum. Setae simplices, erectae, atro-ferrugineae, prope apicem pallidiores, laeves, usque ad 10-septata, 80–350 μ longae, basi 5–8 μ latae, apicem acutum versus 1·5–2 μ latum sensim in artius cogentes. Phialides flavae, cum tunicis tenuibus, cylindracea, 30–50 × 4·5–9·5 μ. Phialospora endogena in catenis sporidiis maturis apice, cylindracea, crasse-tunicata, continua vel 1-septata, hyalina, 8–25 × 4–6 μ.

Hab. in foliis emortuis Cladii marisci, Wareham, Dorset, 26 May 1961, **IMI** 89626b Typus.

Colonies amphigenous, effused, dark reddish brown, velutinous. Mycelium partly superficial, partly immersed in the substratum. Immersed mycelium of thin, hyaline hyphae ramifying in the mesophyll, on emergence through stomata producing a cluster of 2–10 phialides, or a tuft of 1–5 setae surrounded by up to 30 phialides, and scanty, pale yellowish-brown superficial mycelium. *Setae* simple, erect, thick-walled throughout, dark reddish-brown except towards the apex, smooth, usually 3–5 (0–10) septate, 80–200μ, sometimes up to 350μ long × 5–8μ wide at the base, tapering gradually to a pointed apex, 1·5–2μ wide. *Phialides* borne directly on the superficial mycelium or on short basal cells from which sterile, hyaline filaments often arise, thin-walled, uniformly yellow-brown, cylindrical, 30–50 × 4·5–9·5μ, usually about 8μ wide at their broadest point near



Text-fig. 2. A, *Chaetochalara africana*, phialospores, phialides and setae; B, *C. cladii*, phialospores, phialides and setae.

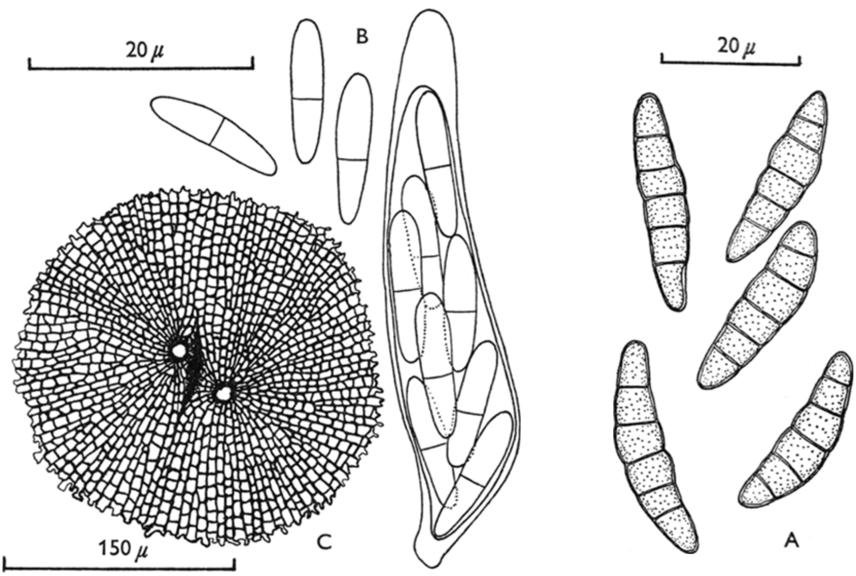
the base, narrowing gradually to a 6·5 μ wide neck. *Phialospores* endogenous, produced in basipetal chains from the base of phialide, continuous, or more often 1-septate, thick-walled, cylindrical, hyaline, 8–25 × 4–6 μ.

Hab. On dead leaves of *Cladium mariscus*, Sugar Hill, Wareham, Dorset, 26 May 1961, **IMI** 89626b, type.

LEPTOSPHAERIA ALBOPUNCTATA (Westend.) Sacc., *Sylloge Fung.* **2**, 72, 1883

Hab. on dead culms of *Phragmites communis*, Flatford, Suffolk, 16 Aug. 1962, **IMI** 95210a.

This collection (Text-fig. 3A) agrees in all respects with the account given by Müller (1950). Johnson (1956) and Johnson & Sparrow (1961) considered this to be a marine species and quoted an extensive synonymy. The species has recently been recorded by Gareth Jones (1962) on decaying driftwood and on *Spartina townsendii* in South Wales.



Text-fig. 3. A, *Leptosphaeria albo-punctata*, ascospores; B, *Microthyrium ilicinum*, ascus and acospores; C, *M. ilicinum*, thyriothecium.

MICROTHYRIUM ILICINUM de Not., in *Erb. crittog. ital.* Ser. 1, no. 994, 1862 (Text-fig. 3B, C)

Myiocopron ilicinum (de Not.) Sacc., in *Sylloge Fung.* **2**, 660, 1883

Thyriothecia amphigenous, superficial, scutelliform, 150–250 μ diam., solitary or 2–3 fused together, opening by a central pore, margin more or less fimbriate. Wall 1 cell thick, composed of radial files of dark brown cells. *Asci* peripheral, almost horizontal, with tips facing the central pore, cylindrical, markedly bitunicate, 35–65 × 6–10 μ, 8-spored. *Ascospores* ellipsoidal, 1-septate, not or slightly constricted at the septum, with the upper cell often longer and slightly broader, 12–16 × 2–3 μ.

Hab. On rotting leaves of *Quercus ilex*, Siena, Italy, A. Tassi, 1862, **IMI** 109411, Erbar. Crittogam. Ital. no. 994, type ex **BM**.

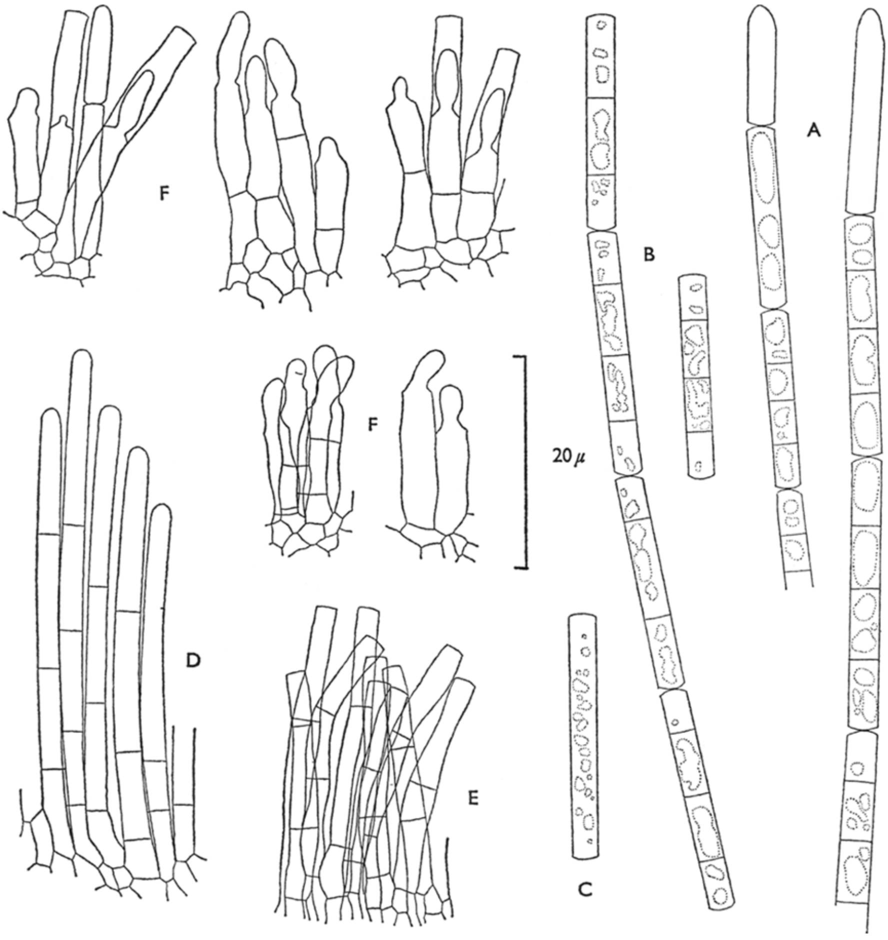
This species is represented in **IMI** by ten collections on *Q. ilex* and two collections on *Q. cerris*, all from Great Britain.

When de Notaris issued exsiccati of *Microthyrium ilicinum* (1862) they bore a full, printed description of the species; this, according to Art. 29 of the *International Code of Botanical Nomenclature*, 1961, constitutes effective publication. He described the ascospores as simple. Saccardo was not convinced that the ascospores remain continuous, nevertheless he transferred the name to *Myiocopron*. Grove (1930), recording this fungus from Great Britain for the first time, found 1-septate spores and described it under its original name. *M. ilicinum*, which appears to be common on dead leaves of *Quercus* (particularly *Q. ilex*), has since been collected in Britain on several occasions. Through the kindness of Mrs Balfour-Browne we were able to examine the de Notaris type preserved in Herb. **BM** and compare it with British material. We found them identical in all respects. Thyriothecia containing both continuous and 1-septate ascospores were found on all specimens in varying proportions irrespective of the date of collection. It appears that the original description was based on an immature fungus and that this has been the cause of subsequent confusion.

Septotrullula bacilligera* Höhn., in *Sber. Akad. Wiss. Wien*, Abt. 1, **111, 1026, 1902 (Text-fig. 4; Pl. 25, figs. 2, 6)

Höhnel (1902) formally described *Septotrullula* as a new genus in the Melanconiales with two species—*S. bacilligera* Höhn. and *S. peridermalis* Höhn.; no type species was designated. He suggested that *Septotrullula* was closely related to *Bloxamia* Berk. & Br. and *Trullula* Cesati and stated that it also showed similarities with *Trimmatostroma* Corda with respect to the way in which the conidia were formed. Clements & Shear (1931) cited *Septotrullula* and *Hyaloceras* Dur. & Mont. as facultative synonyms of '*Siridium* Nees' (*Seiridium* Nees ex Fr.) and quoted *Septrotrullula bacilligera* as the lectotype species of *Septotrullula* on the basis of page priority. It was, however, Grove (1937) who formally designated the lectotype species by reducing *S. peridermalis* to synonymy with *S. bacilligera*.

In attempting to determine the taxonomic relationships of *S. bacilligera* var. *cambrica* Grove & Rhodes (see p. 362), it was felt that study of the original material of *S. bacilligera* was essential. Höhnel's collection consisted of five small fragments of bark. These were very carefully examined but they bore no identifiable fungus. The packet, however, shows measurements in Höhnel's handwriting with illustrations of a 3-septate spore and a section of a mature fructification (Pl. 25, fig. 2). These correspond closely to his published data and leave no doubt as to the identity of the fungus he described. This species, though not necessarily common, is represented by thirteen collections in **IMI**. It is, moreover, readily identifiable by reference to Höhnel's description. According to the *International Code of Botanical Nomenclature*, 1961, Art. 9, Note 2—'for [such] a name [e.g. *S. bacilligera*] without a type specimen, the type may be a description or figure'. It is therefore proposed to designate the type of this name as the original description (Höhnel, 1902) and Höhnel's own illustrations (Pl. 25 fig. 2) on the packet containing his named material of this species. As a standard specimen which agrees closely with Höhnel's description and illustrations and also shows the salient features of this species we designate **IMI** 32258a. The following account of the fungus is based on this specimen unless otherwise indicated.



Text-fig. 4. *Septotrullula bacilligera.* A, Upper part of conidial chain (**IMI** 25532a); B, mature conidia (**IMI** 405336d); C, young aseptate conidium (**IMI** 25532a); D, vertical section of young sporodochium (**IMI** 2761a); E, vertical section of old sporodochium in which younger conidia have become detached (**IMI** 40536d); F, vertical section of damaged sporodochia in which growth of conidial chain is continued from the apex of the preceding intact spore (**IMI** 25535f).

The formation of a sporulating stroma is preceded by the irregular growth of a fibrillose superficial subicle, which is indeterminate in size but not exceeding 25 mm.[2] When young, the deep olive buff stromata never become as large as the subicle. They are completely flat, though raised above the level of the subicle, circular, elliptical or irregular, 1–2 mm.

diam. The slimy spore mass remains flat and encrusted over the conidiophore-bearing stroma. It frequently becomes cracked in places. Under moist conditions spore formation becomes more rapid and since the conidia are formed in long adhering slimy chains, a pulvinate mass is formed over the stroma (Pl. 25, fig. 6). This is again variable in outline but generally measures 1–2 mm. diam. × 2 mm. in depth. Stromata are occasionally confluent but more often solitary. The catenate conidia are regularly oblong with distinctly truncate ends (Text-fig. 4A, B). They are faintly coloured and normally have three distinct transverse septa; 1–5 septate conidia have, however, been observed in other collections. Young conidia are eguttulate, but mature conidia have one large guttule or several smaller ones in each cell. The conidial range, 19–29 × 2–3·5 μ, is slightly wider than that given by Höhnel (24–26 × 2–3 μ).

The conidiophores or spore-bearing hyphae are almost indistinguishable from both the irregular thick-walled cells of the basal stromatic region and the developing conidia. They are cylindrical, closely packed and septate, forming a single long unbranched chain of septate conidia with the oldest spore at the base. Each succeeding conidium is formed acropetally from the apex of the previous conidium in a simple blastic manner. Under exceptional conditions of temperature and humidity the growth of the apex exceeds the differentiation of conidia below it, so that a long filiform septate hypha is produced without the distinctive constrictions between the fully differentiated conidia that are apparent under normal conditions. If a normal spore chain is broken either between conidia or across a conidium, then growth is continued from the apex of the preceding spore. This is shown by **IMI** 25535f (Text-fig. 4F). This type of spore development is already known in the Moniliales and has been dealt with by Hughes (1953). He described a similar type of development in his section IA for *Septonema hormiscium* Sacc. and *S. secedens* Corda, both of which are characterized by multiseptate conidia. This acropetal growth is quite distinct from the basipetal type seen in *Phragmotrichum* species.

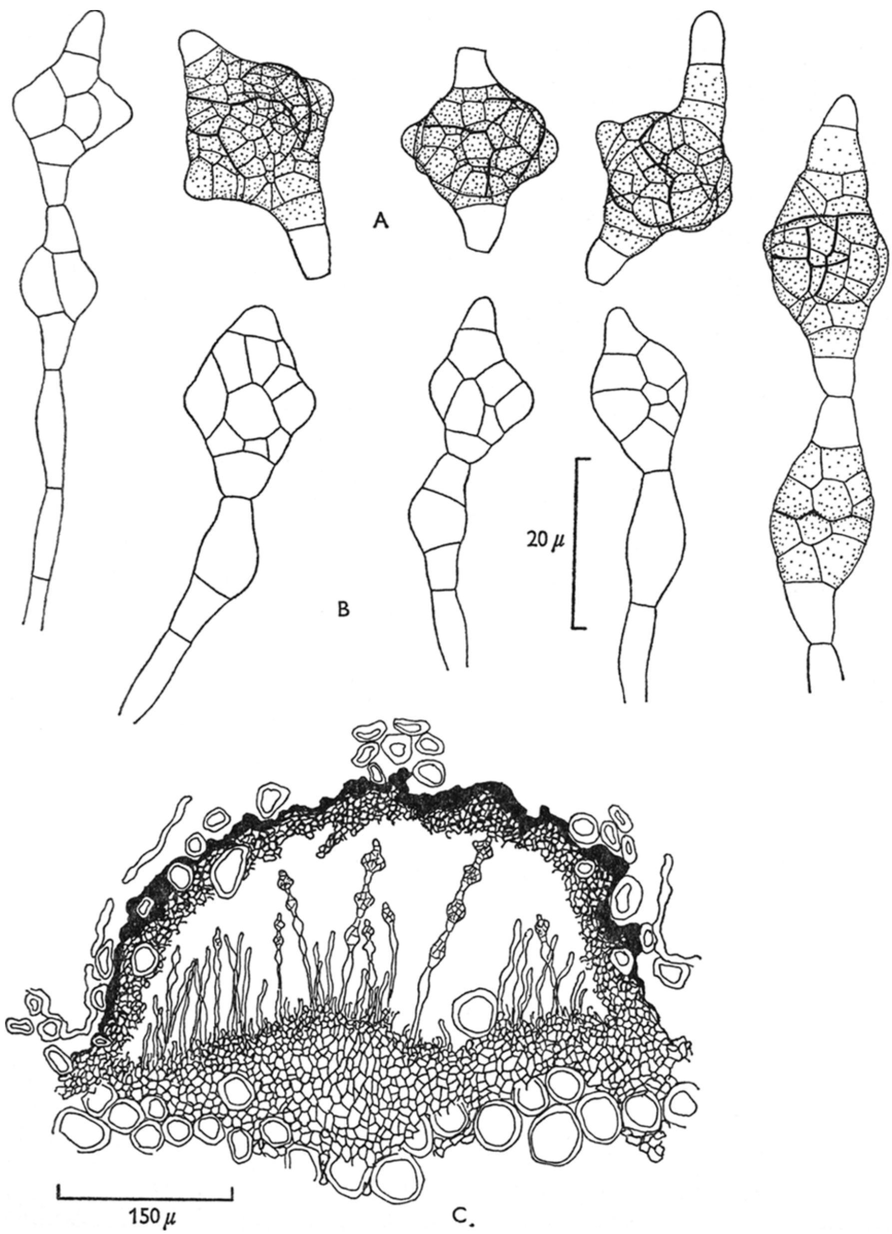
Hab. On cortex of *Alnus*, Purkersdorf, Austria, 1 June 1902, F. von Höhnel, type of *Septotrullula bacilligera* (**IMI** 104960 ex Herb. **FH**); on *Betula* bark, Oxshott, Surrey, G.B., 21 Nov. 1948, S. J. Hughes, standard specimen of *S. bacilligera*, **IMI** 32258a.

This species is represented in **IMI** by eight collections on *Betula* bark, three on *Fagus sylvatica* bark and one on *Quercus* bark, all from Great Britain.

PHRAGMOTRICHUM CHAILLETII Kunze, in Kunze & Schmidt, *Mykologische Heft*, **2**, 84, 1823 (Text-fig. 5)

Gymnosporangium chailletii (Kunze) Spreng., *Systema Vegetabilium* (*Caroli Linnaei*), Ed. 16, **4**, 1, 562, 1827

Fructifications are solitary or less often gregarious. Young conidia are initially enclosed in a globose or flattened discoid to hysterioid thick-walled subepidermal fructification, 350–550 μ diam. The stroma is well developed and composed of thick-walled, bay, pseudoparenchymatous cells. It is covered at the sides and above by an outer layer of thick-walled mummy brown sclerotioid cells. The conidial mass is exposed by rupture of the cuticle and epidermis and subsequent splitting and degeneration of the upper and lateral walls; finally the fructification becomes excipuloid to hysterioid. *Conidia* are honey-yellow, except the apical and basal cells



Text-fig. 5. *Phragmotrichum chailletii*. A, Mature conidia (**IMI** 44725); B, basipetally maturing chains of conidia (**IMI** 44725); C, vertical section of young fructification (**IMI** 22666).

which are somewhat paler, 24–35 × 14·5–20 μ. Young conidia are intercalary and catenate. As the condidia increase in size they expand at the equator and each end becomes distinctly tapered. Transverse septa separating the apical and basal cells from the enlarged median cell are formed first, then the median cell divides transversely, longitudinally and obliquely to become muriform. At the same time four rather variable obtuse beaks are formed at 90° intervals round the equator. The mature conidium is finally 6-pointed. The first formed conidia are truncate at the base and obtuse at the apex but subsequent spores are truncate at both ends. *Conidiophores* are well-differentiated, 2–3 septate, free, capable of meristematic growth from the base and are up to 25 μ in length. Conidia are differentiated from the apex downwards so that the conidiophore merges imperceptibly with the chain of conidial initials. Such chains which are often branched at the base form up to 9 successive conidia.

This species is unrecovered for Great Britain. It is represented in **IMI** by two collections on *Picea excelsa* and one on *Abies*, all from European localities.

Phragmotrichum karstenii nom.nov. (Text-fig. 6A; Pl. 25, figs. 3–5)

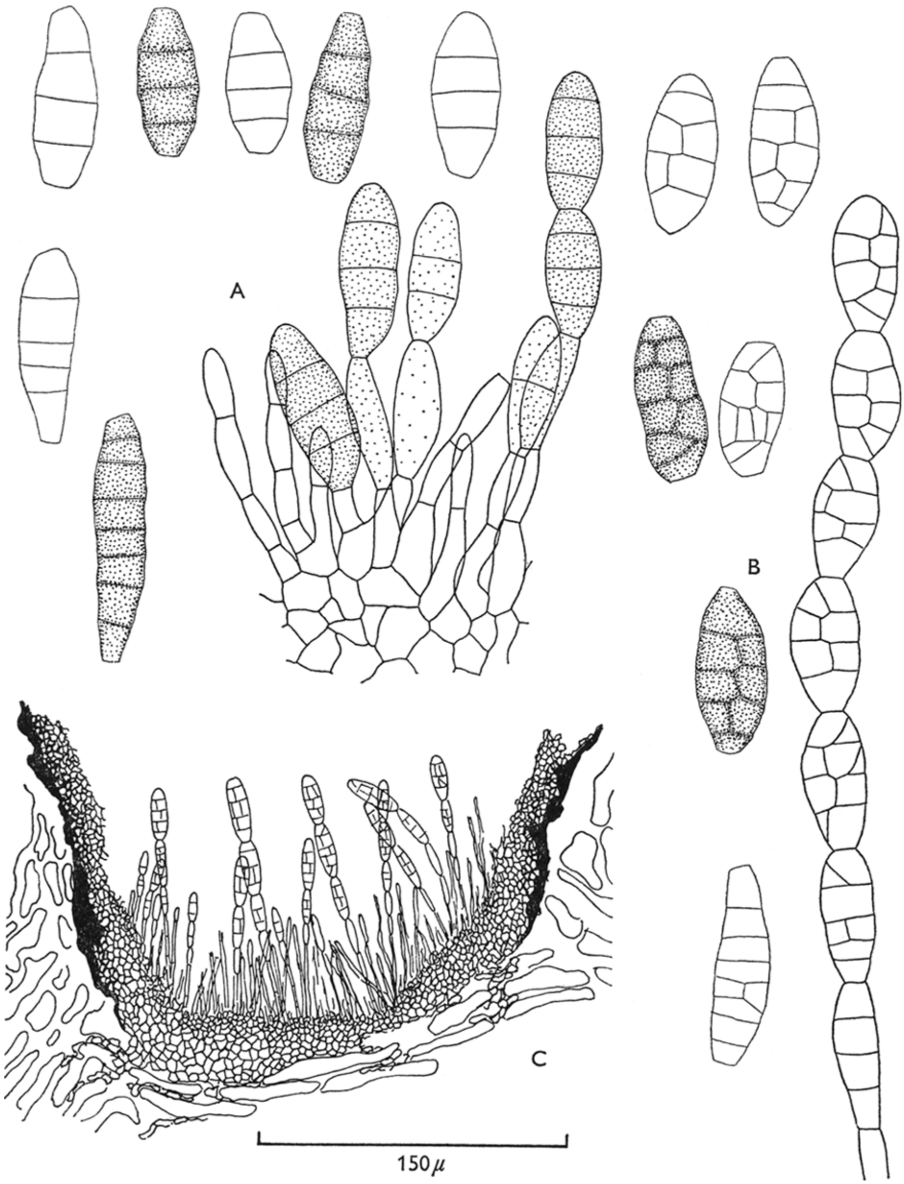
Taeniophora acerina Karst., *Meddn Soc. Fauna Flora fenn.* **13**, 163, 1886 (non *Phragmotrichum acerinum* Fr., *Summa Vegetabilium Scandinaviae*, 474, 1846)

Septotrullula bacilligera Höhn. var. *cambrica* Grove & Rhodes apud Grove, *J. Bot., Lond.*, **70**, 33, 1932

Alysisporium rivoclarinum Peyron., *Bull. Soc. mycol. Fr.* **28**, 140, 1922

?*Seiridiella ramealis* Karst., *Meddn Soc. Fauna Flora fenn.* **18**, 67, 1892. (By description only!)

Fructifications have been variously interpreted as pycnidial, acervular or excipular. In most of the collections examined the young developing conidia are initially enclosed in a globose, thick-walled fructification, up to 300 μ diam., which is seated in the cambial tissues of the host and becomes erumpent through the outer layers of bark. The well-developed stroma is composed of thick-walled, bay, pseudoparenchymatous cells and is covered above and at the sides by a thick multicellular wall composed of mummy brown, almost sclerotioid cells. In more mature fructifications the upper and lateral walls degenerate so that the pulvinate conidial mass becomes exposed. One collection on catkins of *Alnus* (**IMI** 734306), however, shows no trace of either a deep-seated stroma or any upper or lateral walls. The thin-walled, slightly coloured cells of what may presumably be interpreted as an acervulus are epidermal. *Conidia* are formed beneath the cuticle and upper epidermal wall and the conidial mass bursts through these outer layers after several conidia have been formed. Conidia from all collections are honey-yellow, ellipsoidal to oval, 17–32 × 5·5–8 μ; many were constricted at the septa but others had slightly collapsed cell walls. The terminal or first-formed spores are obtuse at the apex and truncate at the base; later they are truncate at both ends. Different collections are variable in septation; most conidia are transversely 3-septate, but nearly all collections show varying proportions of 2–7 septate



Text-fig. 6. A, *Phragmotrichum karstenii*, conidia and conidiophores (**IMI** 104478); B, C, *P. platanoidis*, conidia, conidiophores and vertical section of fructification (**IMI** 106836).

spores (Table 1). Very few longitudinally septate conidia were found. *Conidiophores* are poorly differentiated, short, septate, free, and capable of meristematic growth from the base. Conidia are differentiated from the apex downwards so that the conidiophore merges imperceptibly with the chain of conidial initials. Such chains, which are often branched at the base, form up to seven successive conidia.

Hab. On twigs of *Acer platanoides*, 27 June 1876, Vasa, Finland, P. A. Karsten, **IMI** 104795 ex **H** (Type of *Taeniophora acerina*); on twigs of *Alnus glutinosa*, 19 May 1929, Cwm Llwch, Brecon, Wales, G. B., W. B. Grove and P. G. M. Rhodes, **IMI** 45140 ex **K** (Type of *Septotrullula bacilligera* var. *cambrica*); on branches of *Salix caprea*, 5 Aug. 1918, Rioclaretto, Valli Valdesi, Italy, **IMI** 104976 ex **TO** (Type of *Alysisporium rivoclarinum*); on catkins of *Alnus*, 19 May 1958, Llyn Gynant, Wales, G.B., D. Shaw, **IMI** 73430a.

Table 1. *Septation and conidium measurements of* Phragmotrichum karstenii *and* P. platanoidis *in Herb.* **IMI**

	Transverse septa (%)						Longitudinal septa (%)						Dimensions (range and mean) of 100 spores (in μ)	
	2	3	4	5	6	7	0	1	2	3	4	5	Length	Breadth
								P. karstenii						
45140	2	65	13	11	7	2	100	—	—	—	—	—	14·5–31 (22·0)	6–10 (7·5)
73430a	2	75	9	5	4	5	100	—	—	—	—	—	19·5–31 (23·5)	6–8 (7·5)
104795	1	96	3	—	—	—	100	—	—	—	—	—	15–26 (19·5)	6·5–9 (7·5)
104976	7	89	2	2	—	—	100	—	—	—	—	—	16–27 (20·0)	7·5–9·5 (8·0)
								P. platanoidis						
106836	—	40	32	22	4	2	1	3	26	36	22	12	16·5–26 (20·0)	6·5–9 (8·0)
108388	—	28	35	32	4	(1 with 8)	—	6	15	42	28	9	17·5–34 (21·5)	8–12 (9·0)
108389	—	22	35	35	6	2	—	2	14	40	32	12	17–29 (21·5)	7·5–9 (8·0)
108390	27	41	30	2	—	—	—	—	8	24	40	28	17–23 (19·5)	7·5–10 (8·5)

PHRAGMOTRICHUM PLATANOIDIS Otth, *Mitt. naturf. Ges. Bern*, 723, 111, 1870 (Text-fig. 6B, C)

P. spiraeae Vestergr., *Öfvers Vetensk Akad. Förh., Stokh.* **10**, 1, 46, 1897

P. flageoletianum Sacc., *Annls mycol.* **6**, 560, 1908

The size, shape, development and disposition of the fructifications relative to the substratum are comparable with those of *P. karstenii*. There were no marked deviations from the normal, but the fructifications of *P. platanoidis* showed a distinct tendency to be gregarious along the length of branches or twigs. Apart from this it was difficult to distinguish the two species macroscopically. *Conidia* from all collections are honey-yellow or slightly darker, ellipsoidal to oval, constricted at the transverse septa, 16·5–34 × 6·5–12 μ. Terminal or first-formed conidia are obtuse at the apex and truncate at the base but later ones are truncate at both ends. Most conidia have 3–5(2–8) transverse septa and 2–4(1–5) longitudinal septa. Only the youngest conidia were without longitudinal septa.

Conidiophores are poorly differentiated, short, septate, free, and capable of meristematic growth from the base. Conidia are differentiated from the apex downwards so that the conidiophore merges imperceptibly into the chain of conidial initials. Such chains, which are often branched at the base, form up to eight successive conidia. Generally the number of conidia in the chain is in excess of that for *P. karstenii*.

Hab. On twigs of *Acer platanoides*, Bern, Switzerland, G. Otth, **IMI** 108390 ex **BERN** (Type of *P. platanoidis*); on branches of *Spiraea* sp., Uppland, Botanic Garden, Uppsala, Sweden, T. Vestergren, **IMI** 108388 ex **UPS** (Type of *P. spiraeae*); on *Carpinus betulinus*, Rigney sur Arroux, France, ?Flageolet, **IMI** 108389 ex **PAD** (Type of *P. flageoletianum*); on twigs of *Sambucus nigra*, **IMI** 106836 ex **B**.

This species has not been recorded from Britain.

Notes on Phragmotrichum chailletii, P. platanoidis *and* P. karstenii

In attempting to determine the generic relationships of *Septotrullula bacilligera* var. *cambrica*, a fungus recorded for Britain by Grove (1932, 1937), the genera *Phragmotrichum* Kunze & Schmidt, *Taeniophora* Karsten and *Alysisporium* Peyronel were studied.

Grove & Rhodes (Grove, 1932) described a melanconioid fungus on *Alnus* as *S. bacilligera* var. *cambrica*. They suggested that *S. bacilligera* and *S. peridermalis* were but the younger states of this variety. Later, Grove (1937) indicated that *Seiridiella* Karsten and *Taeniophora* Karsten are in many respects very similar to and perhaps even identical with *S. bacilligera* var. *cambrica*. We have already described *S. bacilligera* in another part of this paper and conclude that the two fungi are not congeneric.

Taeniophora was described with a single species, *T. acerina* from *Acer platanoides*, by Karsten (1886). He gave an account of cupulate fructifications and 2–4 (mostly 3–) transversely septate, concatenate conidia with short supporting conidiophores. Diedicke (1913), having examined the fructifications, suggested that *Taeniophora* was very close to *Seiridiella*. The latter genus was described with catenate 4-celled conidia from dry bark of *Betula* by Karsten (1892). Later Diedicke (1914) gave a description and figured the conidia of *T. acerina*. Höhnel (1918) provided an amplified description of what he thought was *T. acerina* but his account of catenate muriform conidia with transverse and longitudinal septa was based on two of his own collections and an account by Fuckel of *Phragmotrichum acerinum* Fr. He did not examine Karsten's material. Petrak (1953) separated *Taeniophora* from *Seiridiella* almost solely on spore septation. Based upon his examination of Karsten's two types he described *Taeniophora* with catenate, muriform conidia, and *Seiridiella* with catenate, transversely septate conidia.

Karsten's descriptions of *Seiridiella* and *Taeniophora* run in part as follows: 'Taeniophora Karst. (N. gen.)....Sporulae 3-septatae, fuligineae, concatenatae, basidiis suffultae.'

'Seiridiella n.gen....Conidia ellipsoides-oblongata vel oblongata, 3-septata, fuliginea, concatenata.'

In neither generic nor specific diagnosis of either genus are longitudinally septate conidia mentioned. We have confirmed this by examining Karsten's material of *T. acerina*. The majority of conidia were transversely 3-septate and measured 15–26(19·5) × 6·5(7·5) μ. No other fungus was present. These details are in good accordance with Karsten's data for the species—

3-septate, rarely 2–4 septate, $18–26 \times 9\mu$. We therefore disagree with Petrak's interpretation of *Taeniophora*.

Karsten's material of *Seiridiella ramealis* was not located in **H**, so no comparisons with *T. acerina* and no confirmation of Petrak's work could be made. However, from Karsten's description and Petrak's account (if accepted) it is tentatively suggested that *S. ramealis* is identical with *T. acerina*.

Phragmotrichum was proposed by Kunze & Schmidt (1823) with the single species, *P. chailletii* from cones of *Pinus abies*. The conidia were described and well-figured as rhomboid, muriform and catenate. So far nine species have been referred to this genus.

P. acerinum Fr. was suggested by Fuckel to be the conidial state of *Cucurbitaria acerina* Fuck. Höhnel (1918), however, thought that the fungus figured with catenate muriform conidia by Fuckel as *P. acerinum* was not the same as that distributed by Fries. We have examined two specimens of Fries's *Scleromyceti sueciae* no. 437 named *Phragmotrichum acerinum* Fr., one ex Herb. Berkeley, 1879, one ex Herb. Hookerianum, 1867, and both deposited in **K**, and concur with Höhnel. The only fungus found on both specimens was a species of *Cryptosporiopsis* Bubák & Kabát. Fuckel's *Fungi rhenani* no. 1514 in **K**, also named *P. acerinum*, bears only *Cucurbitaria acerina* Fuck.

P. platanoidis Otth, described from *Acer platanoides*, was indicated by Höhnel (1918) to be similar or the same as what he took to be *Taeniophora acerina*. We have seen Otth's type and find that the pulvinate conidial masses are produced in excipuloid fructifications. The catenate conidia are regularly 2–5 transversely septate and 2–5 longitudinally septate. A collection (from **B**) labelled *P. platanoidis* on *Sambucus nigra* (misdetermined as *Acer platanoides*) is very similar to Otth's collections. The conidia are 3–7 transversely septate and 2–5 longitudinally septate. *P. platanoidis* is considered to be distinct from *T. acerina* (*P. karstenii*).

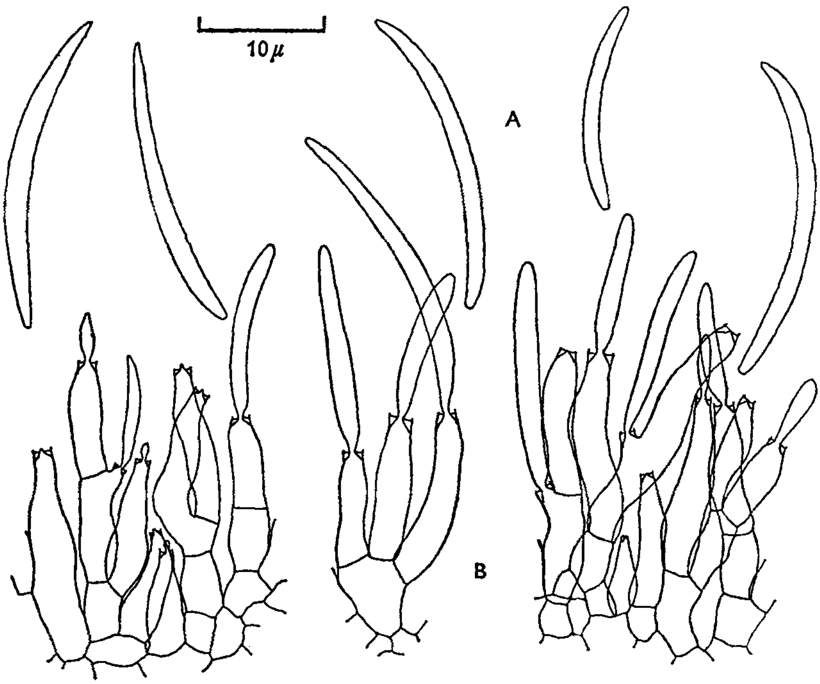
P. quercinum Hoffman (1861) at first appeared to be very similar to *T. acerina* from the illustrations given in Migula (1921). Hoffman's original figure and description show irregularly muriform, indistinctly catenate conidia produced from a pulvinate stroma. This species may be assigned to the '*Coniothecium–Trimmatostroma*' complex.

The original collections of *P. spiraeae* and *P. flageoletianum* were also seen and the species subsequently were found to be conspecific with *P. platanoidis*. They are united under this name.

As a result of these studies, the monotypic genera *Taeniophora* Karst., *Alysisporium* Peyron. and possibly *Seiridiella* Karst. are considered synonymous with *Phragmotrichum* Kunze & Schmidt.

Hughes (1953) suggested that such classic criteria as septation and form of conidia are of secondary taxonomic value. His primary differentiation between genera and groups of genera was based on the way in which the conidia are produced. Thus, Hughes (1951) has placed in *Hansfordiella* Hughes species with phragmospores and dictyospores. Ellis (1959) has adopted a similar system with *Stigmina* Sacc.

The differences between the three species of *Phragmotrichum* described in this paper rest solely upon the septation and form of conidia. The spores in *P. karstenii* and *P. platanoidis* are almost identical in shape but they differ in the absence and presence of longitudinal septa respectively. *P. platanoidis* and *P. chailletii* both possess conidia with longitudinal and oblique septa but conidia are ellipsoid in the one and 6-pointed in the other. All three fungi have identical fructifications and exhibit the same basipetal method of spore development described by Hughes (1953) in his section V. In accordance with Hughes (1951) and Ellis (1959) the species have been referred to a single genus in preference to a generic separation based solely on spore septation.



Text-fig. 7. *Rhabdospora lupini.* A, Conidia; B, septate, branched phialides.

**RHABDOSPORA LUPINI* Buchwald, in Möller, *Fungi of the Faeroes*, II, 187, 1958 (Text-fig. 7)

In the very brief original description the pycnidia were described as small, brownish, when moist slightly orange brownish, 120–144µ diam. The acicular conidia were figured and the range in spore size given as (16–)20–22(–24) × (1–)1·5–1·75(–2)µ. Conidiophores were not mentioned.

Our material agrees closely with these data. *Pycnidia* were 110–150µ diam., with a definite, slightly papillate ostiole. The pycnidial wall was one cell thick, composed of hexagonal pseudoparenchymatous cells. *Conidia* were unicellular, hyaline, falcate, 19·5–24·5 × 1·5–2µ. *Conidiophores* were 0–3 septate, hyaline, filiform to simple, 5–20 × 2–3·5µ. Successive conidia were produced from lateral and terminal phialides. These possessed minute collarettes round the apices. Lateral phialides were situated immediately below the transverse septa. This type of conidiophore and conidium development is typical of Hughes' section IV (1953) and is very common indeed in pycnidial fungi.

Hab. on dead stems of *Lupinus* sp., Lydd, Kent, 9 Oct. 1963, **IMI** 102578c.

R. lupini shows affinities with *Selenophoma* Maire, a genus characterized by falcate conidia. Several species of *Selenophoma* were found to have a method of spore formation identical with *R. lupini*. This was not, however, confirmed in the type species, *S. catananches* Maire, or the type species of *Rhabdospora* (Dur. & Mont. ex Sacc.) Sacc. Until such time as the precise method of spore development in these two species is elucidated, no re-disposition of *R. lupini* can confidently be made.

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EXPLANATION OF PLATE 25

Fig. 1. Type packet of *Septotrullula peridermalis.*

Fig. 2. Designated type illustration on Höhnel's packet of *S. bacilligera.*

Fig. 3. *Phragmotrichum karstenii*, vertical section of young fructification, **IMI** 104976 (× 150).

Fig. 4. *P. karstenii*, vertical section of mature excipuloid fructification, **IMI** 104795 (× 150).

Fig. 5. *P. karstenii*, vertical section of atypical fructification on catkins of *Alnus*, **IMI** 73430a (× 150).

Fig. 6. *S. bacilligera*, vertical section of a mature sporodochium, **IMI** 25532a (× 150).

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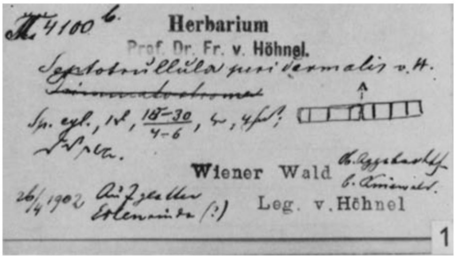
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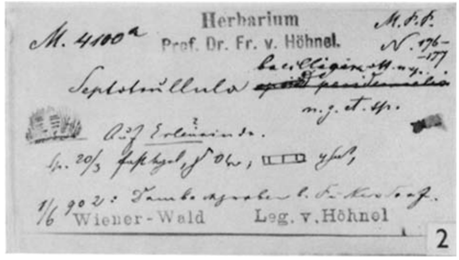
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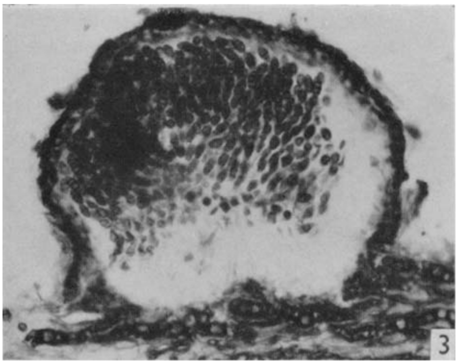
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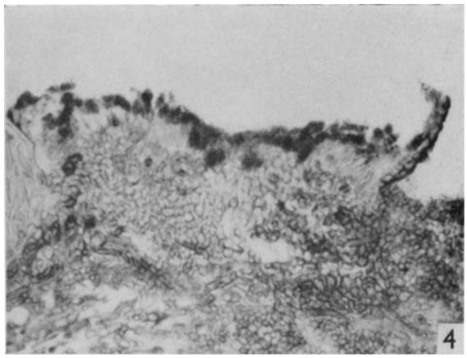
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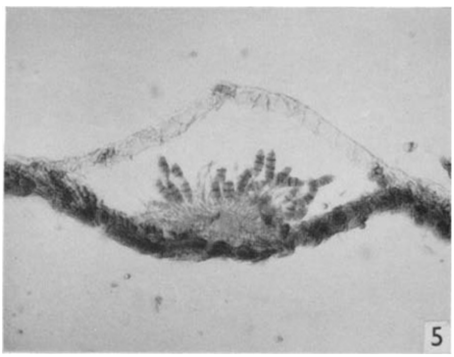
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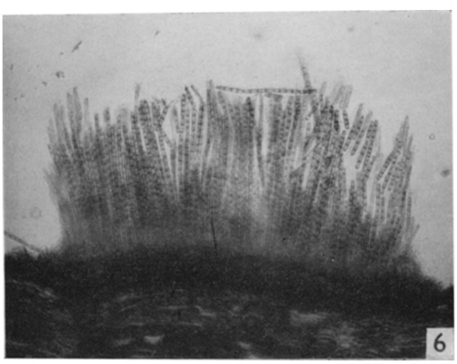
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