

## Ascomycetes on leaf litter of *Laurus nobilis* and *Hedera helix*

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The following taxa described and illustrated from leaf litter of *Laurus nobilis* are new host records and new records for the British Isles: *Anthostomella spartii*, *Massarina papulosa* and *Phacidium aquifolii*. Notes are given on collections from *Laurus nobilis* leaf litter of *Micropeltopsis ammophilae* (J. P. Ellis) P. M. Kirk & Spooner comb. nov., *Microthyrium fagi*, *Mollisia fuscidula*, *Mycosphaerella* cfr *vaccinii*, *Unguiculella* sp. and *Valsa coronata*, all of which are new host records. *Phacidium multivalve* is recorded from decaying leaves of *Hedera helix*, and the anamorphs of this and *P. aquifolii* are discussed. In addition, a description is given of *Mollisiopsis quercina* (Sacc.) Spooner & P. M. Kirk comb. nov. and the combination *Unguiculella foliicola* (Graddon) Spooner & P. M. Kirk comb. nov. is proposed.

Key words: *Laurus nobilis*, *Hedera helix*, Ascomycetes, Leaf litter.

Ascomycetes collected during a study of microfungi colonizing leaf litter of *Laurus nobilis* in the British Isles include many which were previously unrecorded from this host and several which have proved new to the British Isles. Some of these have been previously reported (Kirk, 1981, 1984) and additional species are considered in the present paper, together with a related taxon from leaf litter of *Hedera helix*.

*Anthostomella spartii* Berl. & Vogl., *Atti Accad. scient. veneto trent.-istriana* 10: 212 (1889). (Fig. 1A-B)

*Anthostomella mesembryanthemi* Da Camara & de Vasconcelos, *Agronomia lusit.* 17: 93 (1955), *vide* Francis (1975).

Ascomata perithecioid, ca 160-240 µm diam, black, immersed in the leaf tissue beneath an indistinct clypeus, ostiole slightly raised. Asci 100-140 × 10-12 µm, cylindric-fusoid, 8-spored, tapered below to a short stalk, rounded at the apex, the pore strongly blue in Melzer's reagent. Ascospores 12-15 (-15.5) × 8-9 (-9.5) µm, broadly ellipsoid with slightly tapered ends when in face view and with rounded ends when in profile, dark brown, uniseriate within the ascus, one-celled, with a single longitudinal germ-slit, gelatinous sheath not clearly observed.

*Specimen examined*: U.K., Devon, Instow, Tapley House, on leaf litter of *Laurus nobilis*, 3 July 1985, P. M. Kirk 1690, IMI 296309.

Francis (1975) redescribed and illustrated *Anthostomella spartii* Berl. & Vogl. from recent collections on *Spartium junceum* (Leguminosae), *Coronilla glauca* (Leguminosae) and *Mesembryanthemum edule* (Aizoaceae) from Italy and Portugal. The

present collection constitutes a new British record for this species and also a new host record. The host families, which now include Lauraceae, are not considered to be closely related and the species seems to be a plurivorous saprophyte on dicotyledonous hosts. Previous collections were on dead branches or stems and the present collection therefore provides additional evidence that fungi previously considered as being restricted to a caulicolous habit may also occur on leaves.

*Anthostomella spartii* Berl. & Vogl. is perhaps most closely related to *A. smilacis* and is distinguished from this, and other species with one-celled ascospores, mainly on spore size.

*Massarina papulosa* (Dur. & Mont.) Bose, *Phytopath. Zeitschr.* 41: 176 (1961). (Fig. 1C-E)

*Sphaeria papulosa* Dur. & Mont., *Expl. sci. d'Algérie* 1 (14): 536, 1848 (1849).

*Metasphaeria papulosa* (Dur. & Mont.) Sacc., *Syll. fung.* 2: 168. (1883).

Ascomata perithecioid, 170-200 µm diam, slightly depressed, ca 160 µm high, amphigenous, gregarious, solitary, sub-epidermal, non-stromatic, blackish, ostiolate, ostiole non-papillate. Asci 70-85 (-100) × 14-16 (-18) µm, bitunicate, narrowly lageniform or sub-cylindric, short-stalked, 8-spored. Ascospores 18-22(-24) × 5.5-7.0 µm, hyaline, thin-walled, 4-7-euseptate, asymmetric, initial septum sub-median, upper cell broader, developing 2-4 septa, lower cell finally 1-2-septate, gel sheath not clearly observed; spores irregularly arranged in the ascus, 2-3 seriate. *Pseudoparaphyses* narrowly

cellular, hyaline, much branched and anastomosing, closely septate, 1.5–2.5 µm diam. *Ascomata* wall 15–20 µm thick at sides and base, composed of 3–5 layers of dark brown elongate cells 4–10 × ca 2 µm; upper wall somewhat thickened to 28–32 µm, with slight development of clypeal tissue comprising irregular dark brown hyphae 2.0–2.5 µm diam present in cells of the host epidermis immediately adjacent to the ascomata.

*Specimen examined*: U.K., Somerset, Dunster Castle, on leaf litter of *Laurus nobilis*, 18 Aug. 1987, P. M. Kirk 2063, IMI 319659.

The collection cited is the first British record of *Massarina papulosa* (Dur. & Mont.) Bose and apparently the first report of the species from this host genus. This is a truly plurivorous species, known from Europe and elsewhere on decaying twigs and leaves of many host plants, including angiosperms, gymnosperms and pteridophytes (Bose, 1961).

The above description is based solely on the British collection which agrees closely with this species as redescribed by Bose (1961). It differs only in having an ascomatal wall composed of cells which are mostly elongate and rarely polyhedral as described by Bose. The species is evidently variable with regard to stromatic development. The stroma is poorly developed in the present collection but, according to Bose, ascomata may also occur in 'stromatic groups' where 'stromatic tissue is...formed between the upper parts of adjoining fructifications'.

This species is readily recognized by the unusual ascospores which, unlike those of the type and other members of the genus, are asymmetric with regard to both shape and septation. Asymmetric spores are characteristic of *Splanchnonema* Corda (Pleomassariaceae), recently revised by Barr (1982). However, in that genus and other members of Pleomassariaceae the ascomata have thickened lateral walls, and the ascospores are distoseptate and eventually dark brown. In addition, the known anamorphs of species of *Splanchnonema* have large, dark brown, distoseptate, gel-coated conidia. A *Diplodia* anamorph was described for the present species by Bose (1961), which further suggests that it is unrelated to species of *Splanchnonema*.

On the basis of ascomatal structure, *Massarina papulosa* will key to Massarinaceae following Barr (1979; = Lophiostomataceae *sensu* Barr, 1987) and of the available genera is clearly best placed in *Massarina*, to which it will also key in von Arx & Müller (1975). It differs from other species of this genus in ascospore characters, as noted, but also in being the only species with a *Diplodia* anamorph. Whether these differences warrant segregation of the species from *Massarina* requires further study.

**Micropeltopsis ammophilae** (J. P. Ellis) P. M. Kirk & Spooner, comb. nov. (Fig. 2A–C)

*Trichothyria ammophilae* J. P. Ellis, *Trans. Br. mycol. Soc.* **68**: 146 (1977).

*Ascomata* catathecioid, (48–) 55–65 µm diam, 27–32 µm high, appearing black by reflected light, the upper layer one cell thick and composed of radially arranged pale brown to brown quadrangular cells ca 2–4 × 2–4 µm, ostiolate, ostiole central,

raised, forming a collar 2–3 cells high, composed of small cells with dark brown, thickened lateral walls, with 3–5 equidistant apical cells extended into horizontal setae; basal layer of similar construction to upper layer, one cell thick; margin entire. *Setae* (8–) 20–30 × 2–3 µm, dark-brown, thick-walled, non-septate, smooth. *Asci* 18–24 (–26) × 8–10 µm, ovoid to obclavate, 8-spored. *Ascospores*, 8.5–9.5 × 2.0–2.5 µm, ellipsoid to somewhat clavate, hyaline, smooth, with a single median septum, the upper cell bearing four setulae, each 4–7 µm long, arranged in two pairs attached near the septum, the point of attachment forming a dark longitudinally orientated line on the ascospore wall ca 1 µm long, one pair of setulae originating from each end.

*Specimens examined*: All from U.K., on leaf litter of *Laurus nobilis*: West Sussex, Arundel Castle, 13 July 1983, R. W. G. Dennis, IMI 279329; Cornwall, nr Penzance, Gulval, 10 Aug. 1983, P. M. Kirk 1335, IMI 279935; Argyllshire, Tigh-na-bruaich, 11 Oct. 1983, R. W. G. Dennis, IMI 281220; Anglesey, Plas Penmynydd, Feb. 1984, G. E. Fogg, IMI 284417; Strathclyde, Isle of Arran, Brodick Castle, May 1984, W. R. & I. S. Kirk, IMI 287164; Devon, Instow, Tapley House, 3 July 1985, P. M. Kirk 1685c, IMI 296304c; Galloway, Logan Botanic Garden, 26 May 1986, P. M. Kirk 2010, IMI 310191; Devon, nr Tiverton, Knightshays Court, 12 June 1986, P. M. Kirk 2050, IMI 310231.

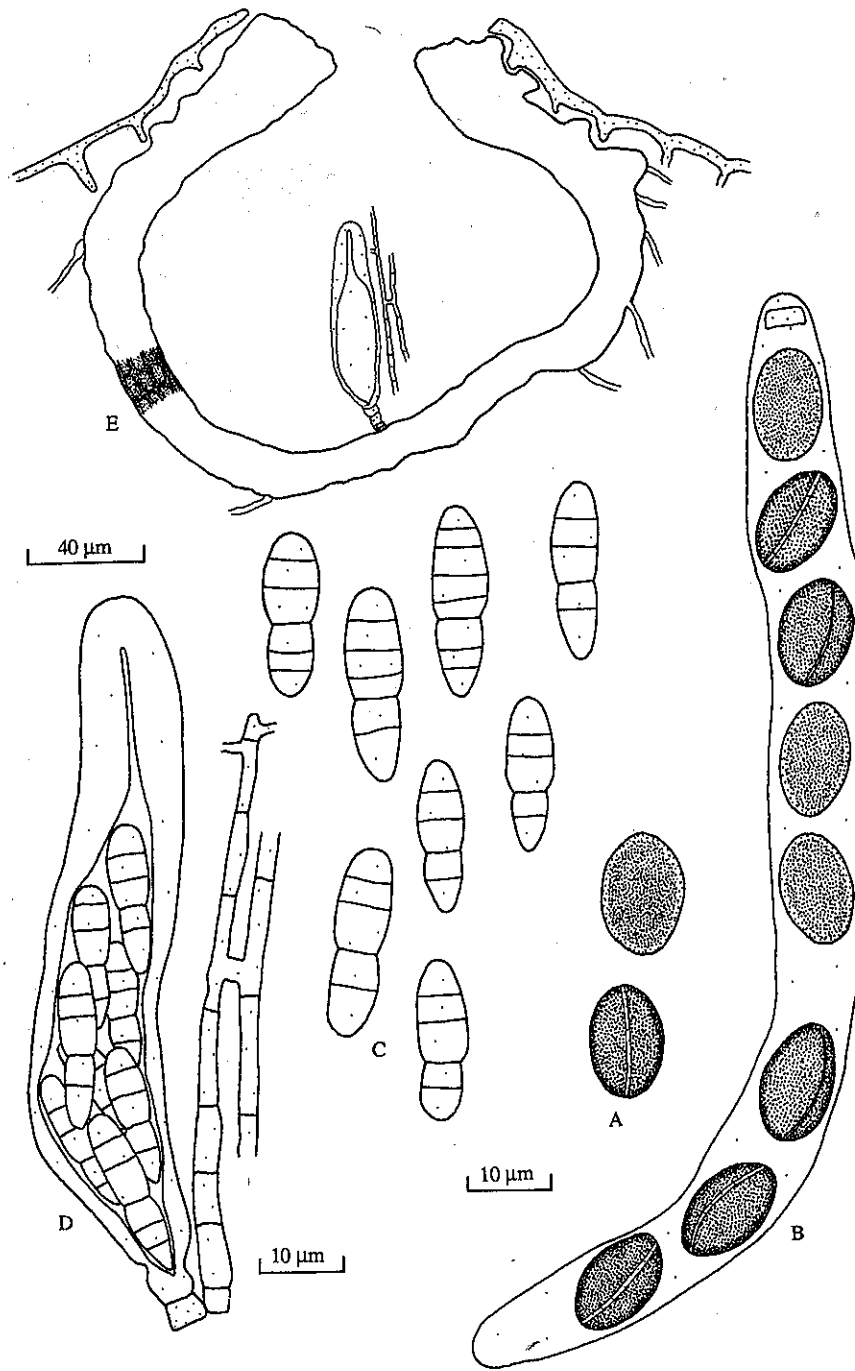
One of the most striking characteristics of the collections cited is the presence of uniformly well-developed dark brown setae which are disposed horizontally around the ostiole of the catathecium. Such setae are diagnostic of the genus *Actinopeltis* as emended by Ellis (1976, 1977) and initially it seemed likely that the fungus on *Laurus* was an undescribed species close to *Actinopeltis palustris* J. P. Ellis. However, reference to the monograph by Ellis (1977) of British species of *Trichothyria* has revealed a close similarity between the species on *Laurus* and *T. ammophilae* J. P. Ellis.

It is clear from examination of collections of *T. ammophilae* in herb. IMI (all on *Ammophila*) that this species may develop both setose and non-setose catathecia. In the holotype collection ascomata are largely non-setose, as described, but depauperate setae have been observed on one of the catathecia on a slide accompanying the specimen. Another collection (IMI 168873) includes several catathecia in which well-developed horizontally spreading setae, sometimes extending beyond the margin of the catathecium, are present. We can therefore recognize no morphological distinction between the *Laurus* fungus and *Trichothyria ammophilae*.

Clearly there is a great deal of confusion in the taxonomy of this group of fungi, particularly at generic level, and further observations and discussion on this problem are given elsewhere (Spooner & Kirk, 1989) where the genus *Micropeltopsis* Vainio (1921) is considered to provide an earlier name for *Trichothyria* (Petraik) Petraik (1950; based on *Trichothyrium* subgen. *Trichothyria* Petraik, 1940). The genus *Actinopeltis* von Höhnelt (1907), as represented by its type species, *A. peristomalis* von Höhnelt, has been misinterpreted and we do not consider it to provide an earlier name for *Micropeltopsis*.

The presence and disposition of ostiolar setae have commonly been used as characters for the delimitation of genera in Trichothyriaceae. However, it would appear from examination of the available evidence, that the presence of

Fig. 1. (A–B) *Anthostomella spartii*. A, Ascospores; B, ascus. C–E, *Massarina papulosa*. C, Ascospores; D, ascus and pseudoparaphyses; E, vertical section of ascoma.



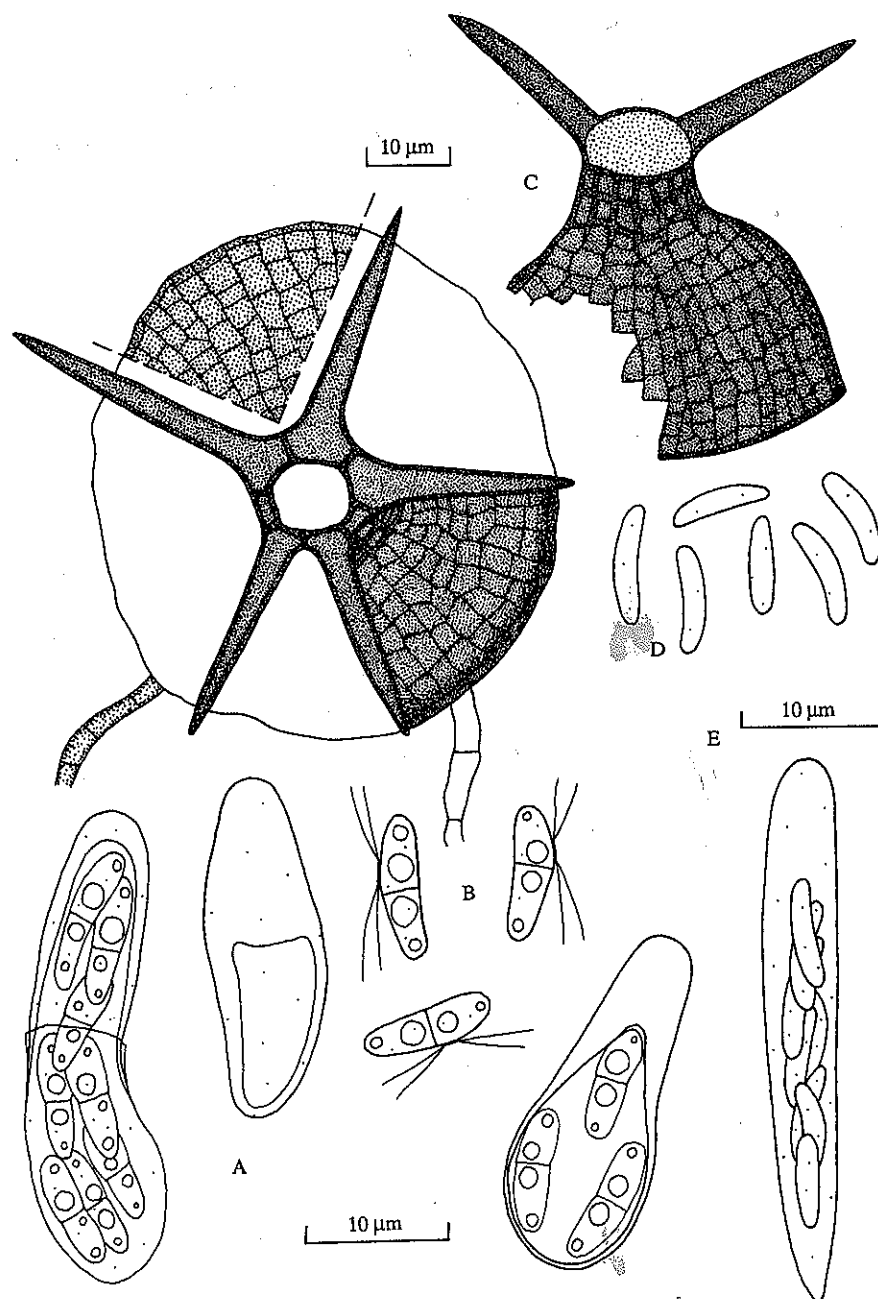
these structures actually has little taxonomic value at generic level as they are inconstant, even within species. In contrast, their disposition, when present, appears to be constant and therefore a useful character at species level.

As shown by Ellis (1977), it is clear that various species of Trichothyriaceae are plurivorous saprophytes. We therefore do not regard the difference in substratum in the present example as taxonomically significant and feel justified in applying the name *M. ammophilae* to the cited collections on *Laurus* leaves.

**Microthyrium fagi** J. P. Ellis, *Trans. Br. mycol. Soc.* 67: 387, 1976 (1977). (Fig. 3A–D)

*Ascomata* thyriothecioid, 100–120 (–140) µm diam, ostiolate, composed of radially arranged, rarely marginally setose, elongate brown-walled cells which in the raised collar surrounding the ostiole become much darker and almost opaque, appearing black; margin of thyriothecium entire, non-fimbriate, sometimes lobate. *Asci* 14–20 (–24) × 4.5–6.5 µm, cylindrical-fusoid to somewhat obclavate, 8-spored. *Ascospores*

Fig. 2. A-C, *Micropeltopsis ammophilae*, IMI 279329. A, Asci; B, ascospores; C, ascomata. D-E, *Valsa ceratosperma*. D, Ascospores; E, ascus.



6.0–8.5 × (1.5–) 2.0 µm, broadly ellipsoid to clavate, unequally 1-septate, lacking setulae.

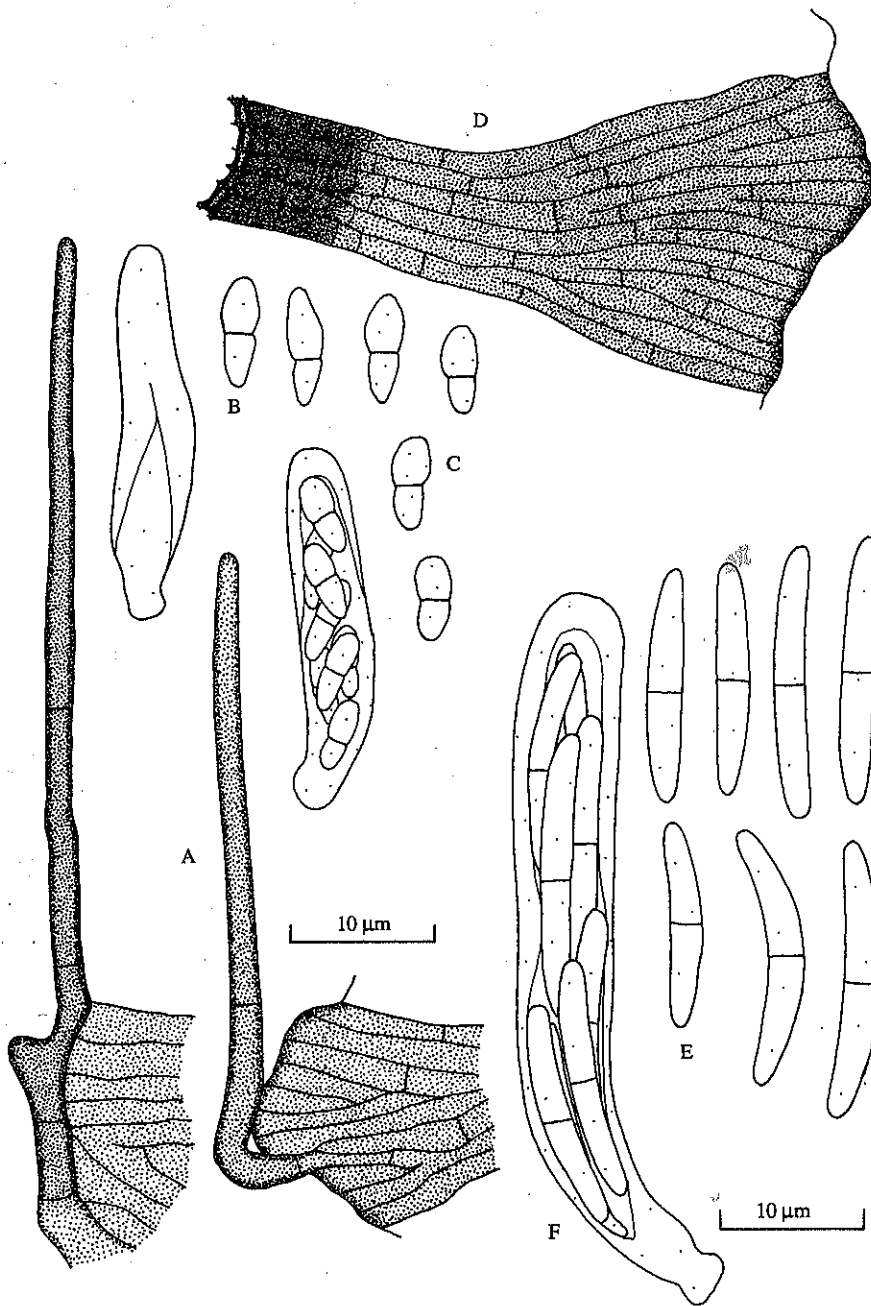
*Specimen examined*: U.K., Cornwall, nr Bodmin, Blisland, on leaf litter of *Laurus nobilis*, 8 Aug. 1983, P. M. Kirk 1327, IMI 279927.

*Microthyrium fagi* J. P. Ellis was described (Ellis, 1976) from five British collections on leaf litter of *Fagus sylvatica*. No other hosts have been published for this species but a Swedish collection on leaf litter of *Berberis vulgaris* (IMI 313219) has been referred here by Ellis (herb. IMI, unpubl.).

The species is characterized by small, non-setulose ascospores 7.0–8.5 × 1.5–2.0 µm, and thyriothechia which are composed of irregular, often elongate cells and which have a

distinct, almost opaque raised ostiole formed from cells with thickened, dark brown walls. These characters are clearly described and illustrated by Ellis for the type, and are also exhibited in the *Laurus* collection. However, the latter is notable for the development of marginal setae in some ascomata; two such setae, which are narrow, 40–55 × 1.5–2.0 µm, brown and 1-septate, are present on one of the thyriothechia examined. This is an interesting observation as setae have not previously been reported in *Microthyrium*. However, in view of the doubtful taxonomic value to be placed on the occurrence of setae in Trichothyriaceae (Spooner & Kirk, 1989), it would seem unwise here to attach much importance to this character. Alone, it is scarcely sufficient to justify the

**Fig. 3.** A–D, *Microthyrium fagi*. A, Marginal setae; B, asci; C, ascospores; D, wall of thyriothecioid ascoma. E–F, *Mycosphaerella* cf. *vaccinii*. E, Ascospores; F, ascus.



removal of the species from *Microthyrium*. However, on the basis of this character in combination with others not shared by the type of the genus, *M. microscopicum* Desm., i.e. raised ostiole, elongate cells in the thyriothecium and the lack of ascospore setulae, it may eventually prove appropriate to remove this species from the genus. At present these characters require further research to elucidate their taxonomic value.

The genus *Chaetothyriopsis* Stevens & Dorman (Stevens, 1927) was stated by the authors to differ from *Microthyrium* only in the presence of ostiolar setae. However, examination of the type collection of the holotype species, *C. panamensis* Stevens & Dorman (on *Oncoba laurina* leaf, Darien, Panama, 10

Sept. 1924, F. L. Stevens, NY, ILL) has revealed this to have ascomata with a basal plate and the genus should clearly be referred to Trichothyriaceae *sensu* von Arx & Müller (1975). The genus *Caenothyrium* Theissen & Sydow, may truly represent a *Microthyrium* with setae if the type species proves to lack a basal plate. These genera are further discussed elsewhere (Spooner & Kirk, 1989).

***Mollisia fuscidula* Rehm, *Hedwigia* 1882: 102 (1882).**

(Fig. 4A–E)

*Mollisia rehmsii* Sacc., *Syll. fung.* 8: 329 (1889), *nom. superf.*, Art. 63.1, non *M. fuscidula* (Sacc.) Sacc., *Syll. fung.* 8: 324 (1889), (syn. *M. dehmsii* (Rabenh.) P. Karsten var. *fuscidula* Sacc.).

*Apothecia* discoid, 300–600 µm diam, hypophyllous, scattered, usually on or near the midrib or on veins, superficial, sessile. *Disc* plane, slightly concave when dry, whitish when fresh, drying pale yellowish, marginate, smooth. *Receptacle* shallow cupulate to patellate, smooth, dark brown to blackish, margin paler, whitish. *Asci* 35–50 × 4–5 µm, 8-spored, cylindric-clavate, apex narrowed and often conical, pore blue in Melzer's reagent. *Ascospores* (6.0–) 7.0–8.5 (–9.5) × 1.2–1.8 (–2.0) µm, cylindric-clavate, tapered distally, rounded at the ends, hyaline, non-septate, biseriate or obliquely uniseriate. *Paraphyses* simple, filiform, obtuse, hyaline, 1.5–2.0 µm diam, equal in length to the asci. *Medullary excipulum* hyaline, 20–25 µm thick at the base, narrowing to the margin, composed of thin-walled, septate hyphae ca 2 µm diam, tending to form small irregular cells at the base, radially arranged in the flanks of the receptacle. *Ectal excipulum* ca 30 µm thick at the base, narrowed towards the margin, composed of short chains of subangular cells lying at a high angle to the surface below, curving round to lie at a low angle to the surface at the margin; innermost cells pale brown, 10–15 × 8–10 µm, surface cells of similar size but smaller near the margin, mostly clavate, dark brown, at the margin hyaline and often extended into hair-like structures 1.5–2.0 µm long.

*Specimens examined*: All from U.K., on leaf litter of *Laurus nobilis*: Cornwall, St Minver, 16 June 1980, P. M. Kirk 644c, IMI 249617c; Essex, Rayleigh, 5 July 1981, B. M. Spooner, IMI 261111 and 261112; Dorset, East Lulworth, 12 July 1981, P. M. Kirk 1047, IMI 260938; West Sussex, Arundel Castle, 13 July 1983, R. W. G. Dennis, IMI 279331; Argyllshire, Tigh-na-bruaich, 11 Oct. 1983, R. W. G. Dennis, IMI 281222.

There are several foliicolous species described in *Mollisia* (Fr.) P. Karsten and *Pyrenopeziza* Fuckel which have been introduced largely on a host basis although, as far as we have been able to establish, none has been described from species of *Laurus*. As described, many of these species appear to be similar and their taxonomy is in need of revision in order to determine their true host range and also to confirm their generic position. There are several small-spored species with apothecia less than 0.5 mm diameter which appear morphologically similar to the species under consideration. A collection of a *Mollisia* in herb. K on leaf litter of *Rhododendron* sp., originally referred to *Mollisia rabenhorstii* (Auersw.) Rehm [sic] (1891), appears to be conspecific with that on the *Laurus* leaves. However, further study has revealed this name to be inappropriate for these collections. *Mollisia rabenhorstii* was described by Rehm from oak-leaf litter and the basionym is cited as being validly published in Rabenhorst, *Klotzschii herbarium vivum mycologicum* no. 920, issued in 1846 as *Peziza rabenhorstii* Auersw. This exsiccatum is not accompanied by a description and the name is therefore a *nomen nudum* and not validly published (Art. 32.1(c)). The valid publication of the name of this taxon is by Rehm (1891) and it should be cited as *Mollisia rabenhorstii* Auersw. ex Rehm. The description provided by Rehm is a detailed one, but because he cites three exsiccata (Rabenhorst, *Klotzschii herbarium vivum mycologicum*, no. 920; Rabenhorst, *Klotzschii herbarium vivum mycologicum*, ed. 2, ser. 1, no. 222; Rabenhorst, *Fungi europaei* no. 2312) it is not clear whether his description is based on the type of the cited

'basionym' or is compiled from an examination of all three collections. Two examples of 920 (herb. B and FH) have been examined but unfortunately lack apothecia. From NY we have received material of 222 only which appears to indicate that they hold no example of 920. However, we have been able to examine examples of 222 and 2312 (herb. K). These both represent the same species and agree with the isotype of *Peziza nervicola* Desm. (Desmazières, *Plantes cryptogamiques de France*, ed. 1, sér. 1, no. 1067, 1840). The name is validly published in this exsiccatum, which is accompanied by a printed description, and pre-dates that of Desmazières (1841). The correct name for this fungus is therefore *Mollisia nervicola* (Desm.) Gillet (1879).

Rehm (1891) cited *Pyrenopeziza foliicola* (P. Karsten) Sacc. var. *quercina* Sacc. (Saccardo, 1889) as a synonym of *M. rabenhorstii*. The former was based on an Italian collection by Spegazzini originally published under the name *P. foliicola* forma *quercus* Sacc. (Saccardo, 1877b; with reference to a description in Saccardo, 1877a) and issued as *Mycotheca Veneta* no. 957 which was labelled as *P. foliicola* f. *quercus pedunculatae*. Two examples of this exsiccatum are preserved in herb. K and examination of these has shown that the taxon is misplaced both in the genus *Pyrenopeziza* and as a synonym of *M. rabenhorstii*. It should be recognized at species level and, as discussed below, is most appropriately referred to the genus *Mollisiopsis* Rehm and not to *Mollisia* as currently circumscribed. This combination is proposed and a revised description given.

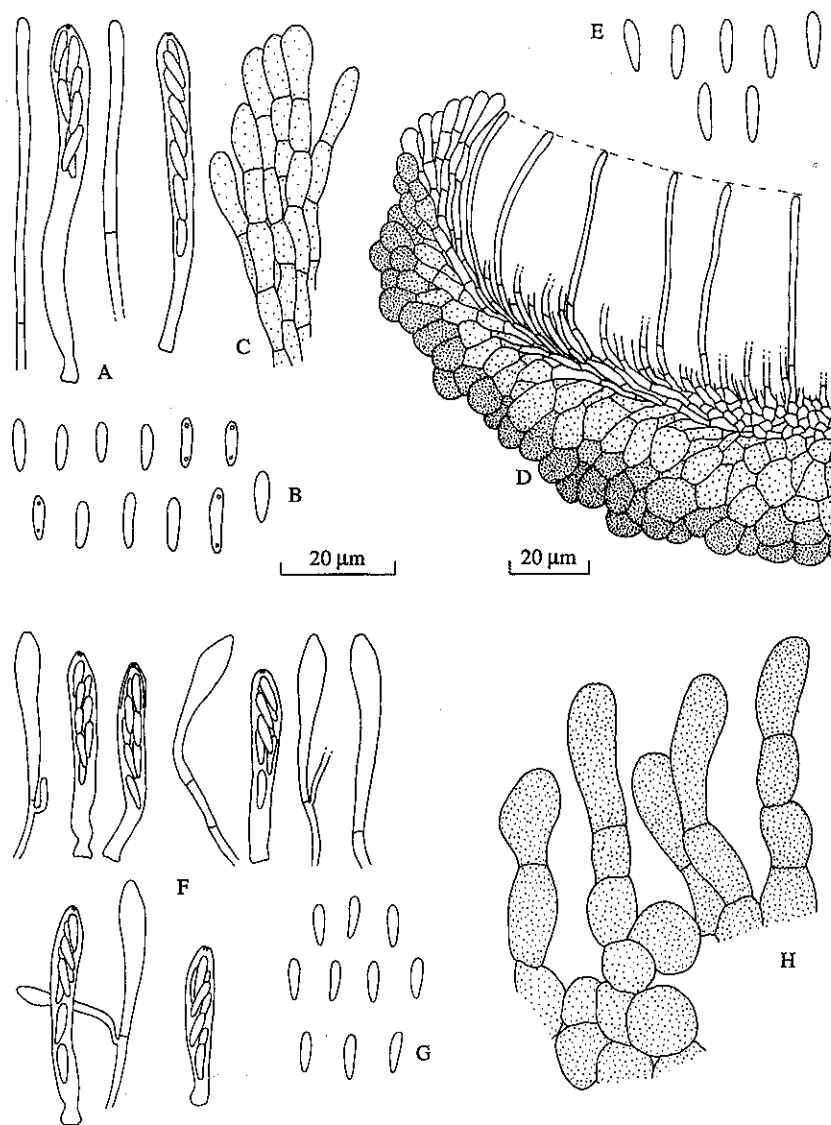
***Mollisiopsis quercina* (Sacc.) Spooner & P. M. Kirk, comb. nov.** (Fig. 4F–H)

*Pyrenopeziza foliicola* var. *quercina* Sacc., *Syll. fung.* 8: 365 (1889).

*Pyrenopeziza foliicola* forma *quercus* Sacc., *Michelia* 1: 111 (1877).

*Apothecia* discoid 300–400 µm diam, hypophyllous, sessile, broadly attached on a thin layer of pale brown hyphae, scattered or in small clusters, commonly seated on or near small veins. *Disc* plano-concave, pallid when rehydrated, smooth, marginate. *Receptacle* patellate, appearing blackish throughout and lacking a pale margin, minutely puberulent. *Asci* 26–36 × 4–5 µm, 8-spored, cylindric-clavate, tapered below to a short stalk, apex narrowed, sometimes conical, pore blue in Melzer's reagent. *Ascospores* 5.5–7.0 × 1.2–1.6 µm, narrowly clavate or clavate-cylindric, rounded at the ends, hyaline, non-septate, mostly biseriate within the ascus. *Paraphyses* lanceolate or narrowly spatulate in outline, apex obtuse or acute, 3.5–4.5 µm diam above, 1-septate near the base and commonly branched below the septum, exceeding the asci in length by 5–10 µm. *Subhymenium* not clearly differentiated. *Medullary excipulum* hyaline, narrow, 10–12 µm thick, scarcely evident at the margin, composed of hyphae 1.5–2.0 µm diam. *Ectal excipulum* 20–25 µm thick, composed of 2–3 layers of angular or subglobose, thin-walled cells 7–12 µm diam, largest at the base, smallest in the upper receptacle and at the margin, near the margin becoming elongate and running out as free, clavate, 0–1-septate, hair-like structures 20–30 × 6–9 µm; walls of these cells brown or

Fig. 4. A–E, *Mollisia fuscidula*. A–C, IMI 261111; A, asci and paraphyses; B, ascospores; C, marginal hyphae. D–E, IMI 260938; D, vertical section of ascoma; E, ascospores. F–H, *Mollisiopsis quercina*. F, Asci and paraphyses; G, ascospores; H, marginal hairs and ectal cells.



pale brown, darker towards the surface; marginal hairs also pigmented. Basal hyphae pale brown, ca 2.0–2.5  $\mu\text{m}$  diam, forming a thin layer 15–20  $\mu\text{m}$  thick, not extending beyond the edge of the apothecium.

*Specimen examined*: On rotten leaves of *Quercus pedunculata* (= *Q. robur*), Conegliano, Italy, May 1876, C. Spegazzini, (Saccardo, *Mycotheca Veneta* no. 957, herb. K).

The apothecia of this species are superficial and clearly it cannot be referred to *Pyrenopeziza* which is characterized by species with erumpent apothecia. The type variety of *P. foliicola*, on fallen leaves of *Alnus* sp., has apothecia which appear similar to those of the fungi under discussion. However, the apothecia of this fungus are erumpent and the species is therefore correctly placed in *Pyrenopeziza*. Lanceolate paraphyses are not characteristic of *Mollisia* and species which possess such paraphyses have been segregated as *Mollisiopsis*.

However, to consider species as generically distinct based on this single character may be unsound. It is possible that there is a closer relationship between those species which occupy a similar habitat type than between those of various habitats which have lanceolate paraphyses.

In describing *M. rabenhorstii*, Rehm clearly states the paraphyses to be filiform and not expanded above. This name should therefore be lectotypified by a collection which exhibits this character and not by one with lanceolate paraphyses such as are characteristic of *Mollisiopsis quercina*, incorrectly cited in synonymy by Rehm. We refrain from selecting a lectotype as we have not seen sufficient examples of the *exsiccata* cited by Rehm. Examples of 222 and 2312 in herb. K bear few apothecia and may not provide the best choice for a lectotype. The example of 920 at FH lacks apothecia and no further examples for consideration have been located. If, in the unlikely event examples of 920 are

found which bear apothecia with lanceolate paraphyses, none of these can serve as a lectotype of *M. rabenhorstii* and in any case, as noted above, they have no nomenclatural standing and the name associated with this number cannot replace *Mollisiopsis quercina*.

The *Mollisia* on *Laurus* leaves is evidently a plurivorous foliicolous saprophyte of coriaceous leaf litter. It agrees with the description of *Mollisia fuscidula* Rehm (1882, = *M. rehmi* Sacc.) on leaf litter of *Vaccinium uliginosum* from Austria, and is probably the same species as that from Scandinavia on leaves and twigs of this host and leaves and berries of *V. oxycoccus* referred to as *Mollisia* sp. by Eriksson (1970). The original description of *M. fuscidula* Rehm (1882) gives ascus dimensions as  $45 \times 8 \mu\text{m}$  ( $45\text{--}50 \times 7\text{--}8 \mu\text{m}$  in Rehm, 1891), slightly broader than those of the *Laurus* fungus, and spores  $8 \times 2 \mu\text{m}$  ( $8\text{--}9 \times 2 \mu\text{m}$  in Rehm, 1891). Eriksson did not give ascus dimensions but quoted an ascospore size range of  $6\text{--}9 \times 1.5\text{--}2 \mu\text{m}$ . On this basis, although we have not seen type material, we feel justified in applying this name to the *Mollisia* on *Laurus* leaf litter.

***Mycosphaerella* cfr *vaccinii*** (Cooke) Schröter in Cohn, *Kryptog.-Fl. Schles.* 3: 335 (1894). (Fig. 3E-F)

Ascomata perithecioid, ca  $100\text{--}150 \mu\text{m}$  diam, black, immersed, becoming erumpent, gregarious; peridium composed of 3–5 layers of brown, polygonal cells ca  $4\text{--}10 \mu\text{m}$  diam. Asci  $40\text{--}48 \times 6\text{--}8 \mu\text{m}$ , cylindrical, rounded at the apex, narrowed at the base into a short stalk. Ascospores ( $14\text{--}17\text{--}19\text{--}24$ )  $\times 2.0\text{--}2.7 \mu\text{m}$ , hyaline, narrowly ellipsoid to fusiform, straight or slightly curved, with a single median septum.

*Specimens examined*: U.K., Cornwall, nr Bodmin, Blisland, on leaf litter of *Laurus nobilis*, 8 Aug. 1983, P. M. Kirk 1328, IMI 279929; U.K., Surrey, Shere, on leaves of *Vaccinium myrtillus*, April 1866, M. C. Cooke 176 (isotype, K).

This species was redescribed by Barr (1972) from collections on overwintered leaves of *Vaccinium* spp. and *Andromeda glaucophylla*. She reported the development of pseudothecial clusters and occasional formation of stromatic complexes, and cited ascospore dimensions as  $16.0\text{--}22.5 \times (1.5\text{--}) 2.0\text{--}3.0 \mu\text{m}$ , and a broad range of ascus size, viz.  $27\text{--}51 \times 6\text{--}8\text{--}(11) \mu\text{m}$ . Other published dimensions for asci and ascospores, summarized by Tomilin (1979), are broadly in agreement with these figures. Isotype material of *Mycosphaerella vaccinii* (Cooke) Schröter differs slightly from Barr's description in having solitary, scattered ascomata, and ascus and ascospore dimensions at the lower end of the quoted range at  $32\text{--}42 \times 6\text{--}7 \mu\text{m}$  and  $15\text{--}18 \times 1.8\text{--}2.0 \mu\text{m}$  respectively. The present collection, therefore, agrees well with the broad concept of this species as described by Barr, but is less in agreement with the examined isotype. It should be noted that Barr did not examine type material and that there is a possibility that more than one taxon is involved. Further study is required to elucidate this problem and at present we refer the *Laurus* collection only tentatively to this species.

Many species of *Mycosphaerella* are regarded as host-specific but, in the absence of other characters and given the few collections available for the present species, we do not regard this as taxonomically important. Overwintered leaf

litter of *Laurus nobilis* has been clearly shown in this and earlier studies (Kirk, 1981, 1982, 1983, 1984) to support the development of fungi which were described from other hosts and were previously regarded as host specific.

***Phacidium aquifolii*** (DC.) Rehm in Rabenhorst, *Kryptogamen-Flora Deuts., Oest. Schw.* 1 (3): 68 (1896). (Fig. 5A-B)

*Xyloma aquifolii* DC., *Fl. Franç.* 5: 159 (1815).

*Phacidium aquifolii* (DC.) Schm. in Kunze & Schm., *Mycol. Hefte*: 34 (1817).

*Phacidiostroma aquifolii* (DC.) von Höhnel, *Annls mycol.* 15: 325 (1917).

Ascomata apothecioid, stromatic,  $300\text{--}1000 \mu\text{m}$  diam, hypophyllous, gregarious, subcircular or slightly angular in outline, black, immersed, splitting irregularly by 4–6 teeth to expose the hymenium. Disc plane, pale yellowish when fresh. Asci  $41\text{--}47 \times 8\text{--}10 \mu\text{m}$ , narrowly clavate, 8-spored, short-stalked, apex narrowed or conical, pore strongly outlined blue in Melzer's reagent. Ascospores  $9.5\text{--}12.5 \times 3.0\text{--}3.5 \mu\text{m}$ , hyaline, narrowly ellipsoid, often inaequilateral, non-septate, smooth, irregularly biseriolate. Paraphyses hyaline, filiform, obtuse, often flexuous and rarely forked above, sparsely septate,  $1.5\text{--}2.0\text{--}(2.5) \mu\text{m}$  diam.

*Specimens examined*: All from U.K., on leaf litter of *Laurus nobilis*: Dyfed, Dinas Cross, 30 May 1987, B. M. Spooner, K & IMI 316805 (teleomorph and anamorph); Essex, Rayleigh, U.K., 25 Dec. 1980, B. M. Spooner, IMI 255786; Surrey, Kew, Royal Botanic Gardens, 3 Apr. 1981, P. M. Kirk 920, IMI 257114; Norfolk, Wheatfen Broad, 25 June 1981, M. B. & J. P. Ellis, IMI 260113; Hampshire, Christchurch Priory, 5 July 1981, P. M. Kirk 981, IMI 260636; Sussex, Slindon, 3 Apr. 1982, P. M. Kirk 1160, IMI 266757 (anamorph only).

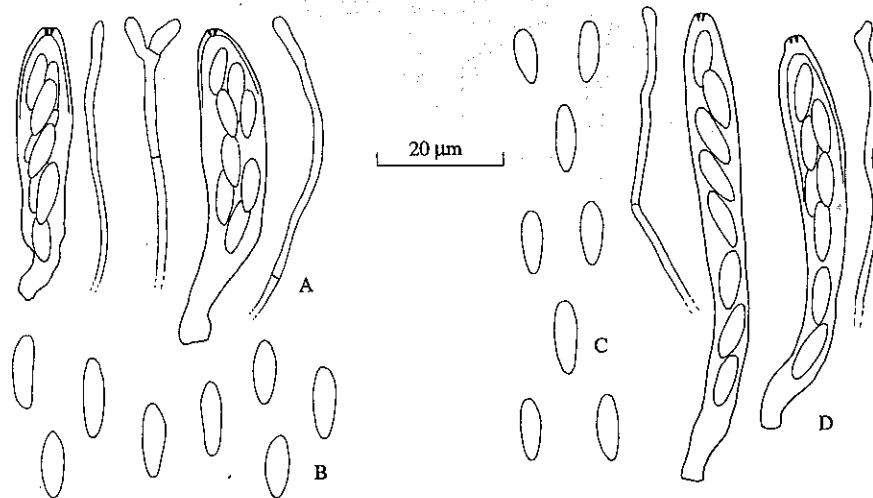
The above description is based solely on the collection from Dyfed and agrees well with the redescription of this species by DiCosmo, Nag Raj & Kendrick (1984). *Phacidium aquifolii* (DC.) Rehm was hitherto known from only two collections on leaves of *Ilex aquifolium*, and has not been previously reported from the British Isles.

This species has a presumed *Ceuthospora* anamorph which was also described by DiCosmo *et al.* (1984). An anamorph present on the collection from Dyfed has conidiomata ca  $200 \mu\text{m}$  diam with conidia  $12.0\text{--}14.5 \times 2.0\text{--}2.5 \mu\text{m}$  and is in general agreement with this description. The additional collections, cited above, are of an apparently identical *Ceuthospora* which, although not associated with a teleomorph, may represent the same species. However, the earliest record of this species from *Laurus* in the British Isles may originate in a report by Cooke (1885) of an undocumented collection from Northamptonshire. Cooke used the name *Ceuthospora lauri* (Grev.) Grev. (Greville, 1827) for this collection, although the type of that species was from leaves of *Prunus laurocerasus*.

*Phacidium aquifolii* may also occur in its anamorphic state in the British Isles on leaves of *Ilex aquifolium*, the type host. Grove (1935) described *Ceuthospora phacidioides* Grev. on leaves of *Ilex aquifolium* as having 'conceptacles of two kinds': (a) smaller, *Phoma*-like in appearance but with 1–4 loculi and (b) larger,  $1.0\text{--}1.5 \text{mm}$  diam, with a white



Fig. 5. A–B, *Phacidium aquifolii*. A, Asci and paraphyses; B, ascospores. C–D, *Phacidium multivalve*. C, Ascospores; D, asci and paraphyses.



furfuraceous disc surrounding the ostiole. The latter is the typical form of the anamorph of *Phacidium multivalve* (DC.) Schm. (see DiCosmo *et al.*, 1984) but the former seems more likely to represent the anamorph of *P. aquifolii*. It matches well the description given by DiCosmo *et al.* (1984) (see also under *P. multivalve*, below).

***Phacidium multivalve* (DC.) Schm.** in Kunze & Schmidt, *Mycol. Hefte*: 42 (1817). (Fig. 5 C–D)

*Xyloma multivalve* DC., *Fl. franç.* 2: 303 (1815).

Anamorphosis: *Ceuthospora phacidioides* Grev., *Scot. Crypt. Flor.* 5: 253 (1827).

*Phacidium multivalve* (DC.) Schm. occurs commonly on rotting leaves of *Ilex aquifolium*, but is most frequently encountered in the anamorphic state. The stroma of this species is characteristic, being large and conspicuous, commonly 1.0–1.5 mm diam, and occupying the entire thickness of the leaf blade. Similar anamorphic fungi occur on leaves of *Euonymus* spp. (*Ceuthospora euonymi* Grove), *Hedera helix* (*C. hederæ* Grove), *Prunus laurocerasus* (*C. lauri* (Grev.) Grev.) and *Rhododendron* spp. (*C. rhododendri* Grove) and, as noted by Sutton (1980), are indistinguishable with regard to conidial size and morphology of the conidiomata. These have not been linked with teleomorphs. However, *P. multivalve* has been found on leaves of *Rhododendron baeticum* according to DiCosmo *et al.* (1984), and the occurrence of this species also on *Hedera helix* leaves strengthens the suggestion by Sutton (1980) that these fungi represent a single species. If this is the case, then the correct name for the anamorph is *C. lauri* (Grev.) Grev.

*Specimen examined*: U.K., Dyfed, nr Castell Henllys, on dead leaf of *Hedera helix* in litter mixed with *Ilex aquifolium*, 28 May 1987, A. Yelland, K.

***Unguiculella* sp.** (Fig. 6 A–C)  
*Ascoma* apothecioid, ca 600 µm diam, superficial, sessile, hypophyllous, whitish throughout. *Disc* ± plane, smooth.

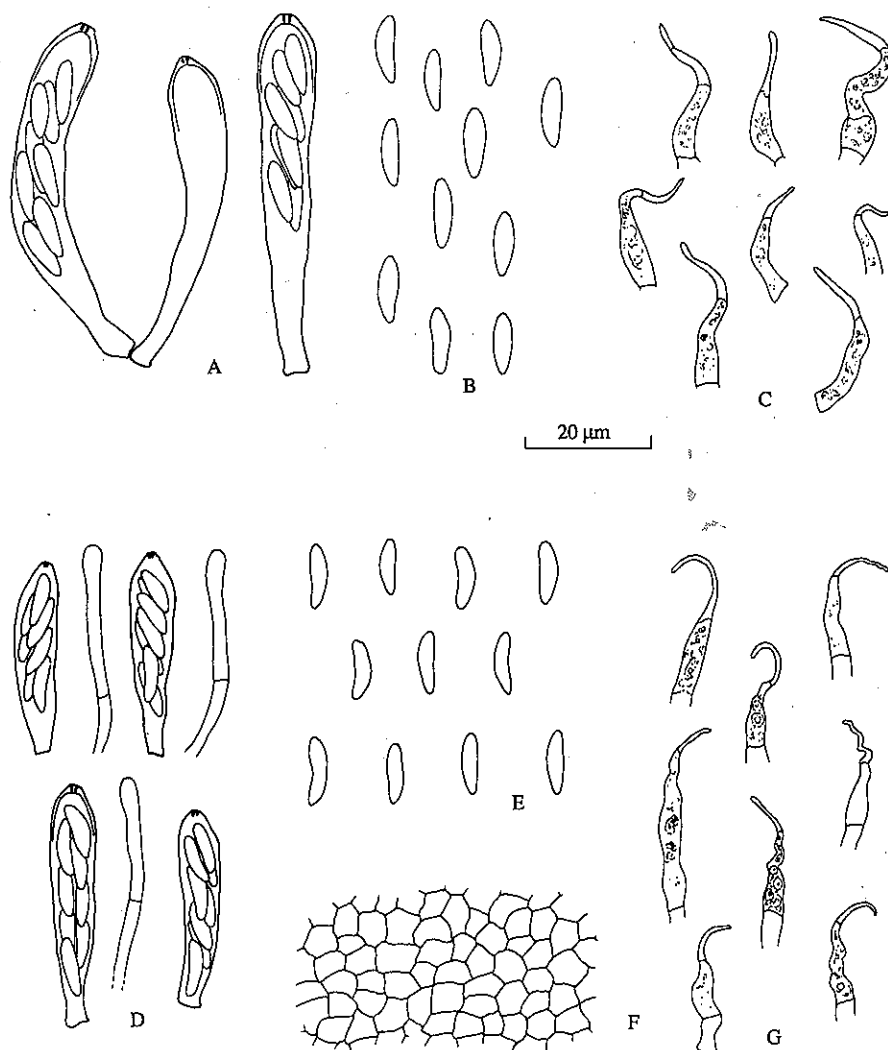
*Receptacle* puberulent. *Asci* 47–54 × 8–9 µm, 8-spored, cylindric-clavate, tapered below to a short stalk, apex conical, pore strongly outlined blue in Melzer's reagent. *Ascospores* 8.5–10.5 × 2.4–2.8 (–3.0) µm, hyaline, non-septate, narrowly ellipsoid, often inequilateral or slightly curved, rounded at the ends, irregularly biseriata within the ascus. *Paraphyses* not clearly seen. *Hairs* 17–25 × 2.5–3.5 (–5.0) µm, tapered to a narrow, hooked or irregularly undulate-curved apex, thin-walled in the lower part and containing granular pigment; apex 0.5–0.8 µm diam, obtuse or acute, apparently solid. *Ectal excipulum* composed of small, thin-walled, ± isodiametric cells 4–8 µm diam, hyaline except for a basal ring of brown-walled cells.

*Specimen examined*: U.K., Essex, Rayleigh, on leaf litter of *Laurus nobilis*, 25 Dec. 1980, B. M. Spooner, IMI 255790.

The collection on which the above description is based consists unfortunately of only a single apothecium. Nevertheless, the characters of the species are clear and it is undoubtedly closely related to *Uncinia foliicola* Graddon (1977), although it differs particularly in the larger dimensions of the apothecium and asci. Apothecia of the holotype of *U. foliicola* (Fig. 6 B) measure only 150–200 µm diam and contain asci 28–37 × (5.5) 6.0–6.5 µm. Ascospores are slightly broader in the present collection than in *U. foliicola* (8–10 × 2.0–2.5 µm) but otherwise closely similar in size. There are no distinct differences in hair characters or excipular structure. Both have an ectal excipulum of small, hyaline, thin-walled cells, except for basal development of brown-walled tissue, and bear hairs which are pigmented, tapered, curved or hooked and apparently solid at the tip. There can be little doubt that these collections are congeneric, but they are probably distinct at species level. We have been unable to find an appropriate name for the *Laurus* species and it seems likely to be undescribed. However, further collections are required to confirm this view and, in any case, the available material is inadequate to serve as the type of a new species.

*Uncinia* Velen. (Velenovsky, 1934; non Persoon, 1807) has

Fig. 6. A–C, *Unguiculella* sp. A, Asci; B, ascospores; C, hairs. D–G, *Unguiculella foliicola*. D, Asci and paraphyses; E, ascospores; F, ectal cells; G, hairs.



been replaced by *Hamatocanthoscypha* Svrček (1977) typified by *H. laricionis* (Velen.) Svrček. This occurs on needles, twigs and cones of conifers and is characterized by the presence of hairs which are obtuse, curved, and thin-walled throughout their length. Several related species, with hairs of similar morphology, are all restricted to conifers so far as is known. Both the present species and *Uncinia foliicola*, which have hairs with solid tips, are therefore doubtfully congeneric with the type of *Hamatocanthoscypha*. This hair type is similar to that of *Unguiculariopsis* Rehm, based on *U. ilicincola* (Berk. & Broome) Rehm, but in that species the asci are quite different in having a rounded, thin-walled, 1-apex. *Phialina* von Höhnel, typified by *P. ulmariae* (Lasch) Dennis, is similar in having pigmented hairs with flexuous tips, but these are otherwise long and straight and furthermore the ectal excipulum of *Phialina* differs from that of the genus to which the present taxa belong in comprising thick-walled cells. The hairs of these taxa are also similar to those of *Unguiculella* von Höhnel (1960a), as typified by *U. hamulata* (Feltgen) von Höhnel. This species was re-examined by von Höhnel who described the

presence, on at least some of the paraphyses, of hooked, glassy tips and introduced the genus as distinct from *Unguicularia* on the basis of this character. Two further species, *Trichopeziza hamata* Sacc. and *Pezizella aggregata* Feltgen, were referred to *Unguiculella* by von Höhnel.

Hook-tipped paraphyses are not characteristic of either of the species under consideration here. The taxonomic significance of this character is not yet fully understood, but the presence of both simple and hooked paraphyses in the type of *Unguiculella* may indicate that it is not an essential character of the genus. Several other species with simple paraphyses are also commonly referred here (see Raitviir, 1970), and, indeed, there is no other genus which is more appropriate to accommodate them. *Unguicularia*, typified by *U. unguiculata* von Höhnel, has hairs of a rather different nature, being straight, almost entirely solid and glassy and dextrinoid, and this genus is not considered appropriate for the present species. The combination for *Uncinia foliicola* in *Unguiculella* is therefore proposed:

**Unguiculella foliicola** (Graddon) Spooner & P. M. Kirk  
comb. nov. (Fig. 6D-G)

*Uncinia foliicola* Graddon, *Trans. Br. mycol. Soc.* **69**: 263  
(1977).

*Specimen examined*: U.K., Warwickshire, Bannams Wood, on dead leaves of *Alnus glutinosus*, Oct. 1970, W. D. Graddon 2026, holotype K.

It is interesting to note that *Unguiculella hamulata* was described from dead stems of *Trifolium repens*. According to von Höhnel (1906b) it is identical with the later *Unguicularia falcipila* von Höhnel. However, the diagnosis of the latter does not refer to hook-tipped paraphyses and, furthermore, the species occurs on dead stems of *Urtica*. It is uncommon or rare in Britain, but the few available collections preserved in herb. K suggest a close association with *Leptosphaeria acuta* (Hoffm.) P. Karsten, an observation first made by W. D. Gaddon (herb. K, unpubl.). These apparent morphological and ecological differences suggest that these fungi may well prove to be taxonomically distinct.

**Valsa ceratosperma** (Tode) Maire, *Publicions Inst. bot. Barcelona* **3** (4): 20 (1973). (Fig. 4B)

*Sphaeria ceratosperma* Tode, *Fung. mecklenb.* **2**: 53 (1791).

*Valsa nobilis* Sacc., *Syll. fung.* **16**: 1128 (1902).

Anamorphosis: *Cytospora sacculus* (Schwein.) Gvritish., *Mikol. i Fitopath.* **3**: 207 (1969).

*Cytospora nobilis* Trav., *Bull. Soc. bot. Ital.* **1904**: 211 (1904).

*Cytospora lauri* Grove, *J. Bot.* **1922**: 45 (1922).

*Ectostroma* lacking. *Ascomata* perithecioid, 180–270 µm diam, clustered, usually in groups of 3–6, rarely solitary, dark brown to blackish. *Ostiolar necks* up to 200 µm long, 100–120 µm diam, lined with periphyses, convergent through an ectostromatic disc ca 250–300 µm diam, exposed by splitting of the host epidermis; necks usually slightly protruding, to ca 80 µm above the host epidermis. *Perithecial venter* comprising an outermost zone ca 15 µm thick composed of 3–4 layers of dark brown, mainly elongate cells 9–18 × 3–5 µm, with somewhat thickened walls and long axes parallel to the surface; inner zone of 2–3 layers of similar but hyaline, thin-walled cells. *Asci* 32–35 × 4–5 µm, 8-spored, ellipso-cylindric, short-stalked. *Ascospores* 6–8 (–9) × 1.2–1.8 µm, hyaline, allantoid or cylindric and slightly curved. *Paraphyses* not clearly observed.

*Specimens examined*: All from U.K. On dead leaf litter of *Laurus nobilis*: (teleomorph only) Rayleigh, Essex, 26 Dec. 1987, B. M. Spooner, IMI 322321; (anamorph only) Studland, Dorset, 27 May 1961, K. A. Pirozynski, IMI 89646d; St Minver, Cornwall, 16 June 1980, P. M. Kirk 643, IMI 249616; Rayleigh, Essex, 25 Dec. 1980, B. M. Spooner, IMI 255785; Abbotsbury, Dorset, 13 July 1981, P. M. Kirk 1078, IMI 260969; Lyme Regis, Dorset, 15 July 1981, P. M. Kirk 1098, IMI 261269; Tunbridge Wells, Kent, 2 Oct. 1981, B. M. Spooner, IMI 262745b; Slindon, Sussex, 3 Apr. 1982, P. M. Kirk 1162, IMI 266759; Royal Botanic Gardens, Kew, Surrey, 10 Nov. 1982, P. M. Kirk 1301, IMI 273255; Rayleigh, Essex, 20 Feb. 1983,

B. M. Spooner, IMI 275857; Abbotsbury, Dorset, 11 June 1986, P. M. Kirk 2043b, IMI 310224b. On dead twigs of *Laurus nobilis*: (anamorph only) Leigh Woods, Bristol, Avon, 30 Apr. 1960, K. A. Pirozynski, IMI 80503h; Studland, Dorset, 26 May 1961, B. C. Sutton, IMI 86891a; Reach, Cambridgeshire, B. McKeown PC84/1897, 11 May 1984, IMI 286674.

The collection of the teleomorph cited above is the first British record of a species of *Valsa* on *Laurus nobilis*. The description of this collection agrees fully with that of *Valsa nobilis* Sacc. (Saccardo, 1902), with asci 30–35 µm long and ascospores 7–8 × 2 µm, on corticate twigs of *Laurus nobilis* in Italy. The presumed anamorph of this fungus, also from Italy on the same substratum, was subsequently described by Traverso (in Saccardo & Traverso, 1904) as *Cytospora nobilis* Trav. It is likely that the later *C. lauri* Grove (Grove, 1922), described from Scotland on the same substratum, is a synonym. *Cytospora lauri* was reported from the British Isles on leaf litter of *Laurus nobilis* by Kirk (1981). The conidiomata occur on the leaf petiole and at the base of the midrib, or occasionally on the leaf blade adjacent to the midrib at the base of the leaf. All known British collections of the anamorph are listed above, and include material on both leaf litter and twigs.

Evaluation of the large number of epithets in *Valsa*, many of which have been based solely on presumed host specificity, is impossible in the absence of a systematic revision of the genus. Modern authors have tended to adopt broad species concepts and have recognized many of these epithets as synonyms of a few plurivorous species based on morphological similarity. The present species clearly belongs to *Valsa* section *Monostichae* as defined by Barr (1978) and agrees closely with the description of *V. ceratosperma* (Tode) Maire, which lectotypifies this section, and is considered a plurivorous species reported from many deciduous trees and shrubs. Many synonyms have been cited for this species, notably by Défago (1944, as *V. ceratophora* Tul. & C. Tul.), Hubbes (1960) and Urban (1958) and there seems every reason to accept the synonymy of *V. nobilis* with *V. ceratosperma* as suggested by Défago and Urban.

As noted by Cannon, Hawksworth & Sherwood-Pike (1985), both *V. ceratosperma* and *V. coronata* (Hoffm.: Fr.) Fr. were placed into synonymy with the later *V. ceratophora* by Défago (1944). However, Urban (1958) recognized two species, *V. coronata* and *V. ceratosperma* (syn. *V. ceratophora*) distinguished primarily by length of asci. This was given as 20–31 µm for *V. coronata* and 28–40 µm for *V. ceratophora*. According to Urban there is no clear difference in spore size between these species and the *Laurus* fungus is therefore, in any case, referable to the latter.

The correct name for the anamorph of *V. ceratosperma* is *Cytospora sacculus* (Schwein.) Gvritish., as shown by Gvritishvili (1982), for which, from available evidence, the two names in *Cytospora* cited above are additional synonyms.

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