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Observations on some genera of Trichothyriaceae

B. M. SPOONER

The Herbarium, Royal Botanic Gardens, Kew, Surrey TW9 3AE, U.K.

P. M. KIRK

CAB International Mycological Institute, Ferry Lane, Kew, Surrey TW9 3AF, U.K.

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Some genera of Trichothyriaceae are reviewed. *Actinopeltis* and *Loranthomyces* are reinterpreted, and it is concluded that *Micropeltopsis* provides an earlier name for *Trichothyrina*. *Micropeltopsis santessonii* sp. nov. is described from *Peltigera* and the following combinations are proposed: *Actinopeltis sordidula* (v. Arx) comb. nov., *Chaetothyriopsis adianti* (H. Syd.) comb. nov., *Micropeltopsis alpestris* (Sacc.) comb. nov., *M. fimbriata* (J. P. Ell.) comb. nov., *M. nigroannulata* (Sacc.) comb. nov., *M. norfolciana* (J. P. Ell.) comb. nov., *M. palustris* (J. P. Ell.) comb. nov., *M. peltigericola* (D. Hawksw.) comb. nov. and *M. pinophylla* (v. Höhn.) comb. nov. The generic name *Pachythyrium* Arnaud ex Spooner & P. M. Kirk gen. nov. is validated and the combination for the type species, *P. parasiticum* (Fabre) Arnaud ex Spooner & P. M. Kirk comb. nov., is made.

Key words: Trichothyriaceae, *Actinopeltis, Chaetothyriopsis, Loranthomyces, Micropeltopsis, Pachythyrium, Trichothyrium.*

Recent investigation of some ascomycetes on leaf litter of *Laurus nobilis* L. (Kirk & Spooner, 1989) recorded *Micropeltopsis ammophilae* (J. P. Ell.) P. M. Kirk & Spooner (Trichothyriaceae Theiss.) on this substratum. Identification of this taxon, previously known only from dead culms of *Ammophila arenaria*, proved particularly difficult. In order to determine an appropriate name for it, a brief survey of relevant taxa was undertaken. This revealed numerous generic names needing consideration and emphasized the difficulties of assessing generic limits in this family, since the taxonomic value of the characters on which they are based has been variously interpreted. This has led to a great deal of confusion in the taxonomy of the Trichothyriaceae, particularly at generic level. Conclusions reached during this survey clarify some of this confusion and they are, therefore, presented here.

The family Trichothyriaceae was established by Theissen (1914), to include genera having in common the form of the ascomata but differing in ascospore characters and the presence of superficial mycelium. The ascomata are flattened and comprise an upper and a lower layer, each one cell thick, composed of radially-arranged brown-walled cells. This form of ascoma was later termed a catathecium by von Höhnel (1917). Asci are arranged radially with their apices convergent towards a well-defined central ostiole. The ostiole is normally papillate and frequently ornamented with dark brown setae of varying form and disposition.

The presence of a basal plate to the ascoma was, until recently, regarded as a character of great taxonomic importance. Fungi of similar appearance, having superficial, shield-shaped ascomata with a radial structure but in which a basal plate is lacking have been commonly segregated both as a distinct family, Microthyriaceae Sacc. (Saccardo, 1883) and, indeed, as a distinct order; they were placed, for example, by Clements & Shear (1931) in Microthyriales and by Luttrell (1973) in Hemisphaeriales. Recently, much less weight was placed on this character by Eriksson & Hawksworth (1986) who included Trichothyriaceae as a synonym of Microthyriaceae. However, as the ontogeny of ascomatal types exhibited by species included in these families is little researched and difficult to assess, we can offer no opinion as to the suprageneric classification of these fungi. Such is, in any case, beyond the scope of the present paper.

The family Trichothyriaceae was maintained by Theissen & Sydow (1917) to include five genera distinguished on the above-mentioned characters and without regard to their ostiolar setae or ecology. Four of these genera contain a number of species which are parasitic on foliicolous fungi, particularly on species of *Meliola*. Since then, many generic names have been introduced in this family, though often with inadequate descriptions, which has led inevitably to the creation of synonyms. Furthermore, it is now clear that three of the genera referred here have, in the past, been misinterpreted and these, therefore, require further discussion.

Actinopeltis v. Höhn.

This genus is typified by *A. peristomalis* v. Höhn. which was described as having setose catathecia and 5-septate, fusoid ascospores (v. Höhnel, 1907). The catathecia were reported to be seated on a brown, hyphopodiate mycelium bearing large, brown, 5-septate conidia. As confirmed by examination of the type specimen (Brazil: Sao Paulo, nr Santos, Raiz da Serra, on fern, 4 June 1901), the species is clearly a meliolaceous parasite. However, this examination has also shown v. Höhnel to have misinterpreted the ascospore characters; we have found consistently 1-septate ascospores measuring *ca* 14–174 µm. Although these have only been seen within asci, they are clearly unlike those described and illustrated by v. Höhnel, which were given as 5-septate, fusoid, 20 × 4 µm and are similar to, although slightly larger than, those of an associated *Nectria*. v. Höhnel also saw this *Nectria* and referred it, probably correctly, to *Hyphonectria byssiseda* Rehm. It may be noted that this species was redescribed by Samuels (1976) who regarded it as a synonym of *Nectria leucorhodina* (Mont.) Samuels. Furthermore, the ostiolar setae described and illustrated by v. Höhnel are often difficult to find and, indeed, are not consistently present. They appear to be completely lacking on catathecia from isotype material in K. The description of these setae by v. Höhnel is also misleading as they are merely comparatively thin-walled, septate hyphal extensions from ostiolar cells and unlike those illustrated for other taxa, e.g. *Actinopeltella nitida* Doidge.

The genus *Actinopeltella* Doidge (1924) was introduced as distinct from *Actinopeltis* solely on ascospore septation as understood from the published description of the latter genus. It is based on a species with 1-septate, hyaline ascospores which occurs as a parasite on the mycelium of *Asterina streptocarpi* Doidge on leaves of *Streptocarpus rexii* from South Africa. There is no apparent reason why it should not be regarded as a synonym of *Actinopeltis* as emended here. This synonymy was previously suggested by v. Arx (Müller & v. Arx, 1962) although the type species of *Actinopeltis* had not been re-examined by him. The correct name for the type species of *Actinopeltella* is *Actinopeltis nitida* (Doidge) v. Arx.

The genus *Mycolangloisia* Arnaud (1918) has similarly been placed in synonymy with *Actinopeltis* by v. Arx (Müller & v. Arx, 1962), a conclusion which appears to be correct.

Chaetothyriopsis Stevens & Dorman

As concluded elsewhere (Kirk & Spooner, 1989), this genus belongs to Trichothyriaceae. The type species, *C. panamensis* Stevens & Dorman (Stevens, 1927), occurs on living leaves of *Oncoba laurina* (Flacourtiaceae) and we have examined two isotypes (*Fungi of Panama* No. 411, herb. NY, ILL) which have the following characters: Catathecia 60–110 µm diam, composed of upper and lower plates of radiating quadrangular cells 3–5 × 3–5 µm; central ostiole surrounded by cells 2–4 × 2–4 µm, with thickened walls and bearing 2–4 setae, setae septate, horizontally disposed, *ca* 40–110 µm; asci 24–28 × 6–7 µm, ascospores 7–9 × 2 µm, clavate, one-septate, non-setulose, hyaline.

The genus *Actinosoma* Syd. (Sydow, 1930) is typified by *A. adianti* Syd. on living leaves of *Adiantum tetraphyllus* forma *acuminata* from Venezuela, and examination of the type collection (El Limón pr. Puerto La Cruz, 15 Jan. 1928, H. Sydow (*Fungi exotici exsiccati* No. 853), isotype K) has shown this to have catathecia similar in structure to those of *C. panamensis* except for the disposition of ostiolar setae which, in this species, are convergent and form a cone. We do not regard this character as important at generic level (see discussion below), and *Chaetothyriopsis* therefore provides an earlier name for *Actinosoma*. The following combination for the type species is proposed:

Chaetothyriopsis adianti (H. Syd.) Spooner & P. M. Kirk, comb. nov.

Actinosoma adianti H. Syd., *Annls mycol.* **28**: 153 (1930).

Actinopeltis adianti (H. Syd.) v. Arx (as '*adianthi*') in Müller & v. Arx, *Beitr. zur Kryptogamenfl. Schweiz* **11** (2): 563 (1962).

Actinopeltella adianti (H. Syd.) Petrak, *Sydowia* **4**: 169 (1950).

Loranthomyces v. Höhnel

The application of the generic name *Loranthomyces*, introduced by v. Höhnel (1909) for *Dothidea sordidula* Lév. (Léveillé, 1845), has been a source of confusion. The circumscription of the genus and its type species includes the characters of two distinct fungi, one a member of Trichothyriaceae which occurs as a hyperparasite on the stroma of the other, a parasitic fungus on leaves of *Loranthus* sp. It is clear from the original description of *D. sordidula* that Léveillé was referring to the latter fungus. Although he described the radial structure of what he interpreted as the ostiole, i.e. the catathecium of the hyperparasite, the description of erumpent stromata 2–3 mm diam and comparison with *Dothidea euglypta* Mont. undoubtedly show that the name was introduced for the stromatic fungus. Later, v. Höhnel (1917) realized the nomenclatural error and attempted to rectify this by applying the name *D. sordidula* to one of these elements. However, in doing so he selected the trichothyriaceous element as the lectotype of *D. sordidula*, which is clearly in conflict with the protologue. Thus, under Art. 48.1 of the *International Code of Botanical Nomenclature*, *Loranthomyces sordidulus* v. Höhnel, 1917 is a later homonym of *L. sordidulus* (Lév.) v. Höhnel, 1909. Petrak (1950) discussed *Loranthomyces* and followed v. Höhnel in applying the name to the trichothyriaceous element. Later, v. Arx (in Müller & v. Arx, 1962) accepted both applications of the name *L. sordidulus*, one as the basionym of *Cyclotheca sordidula* (Lév.) v. Arx, and the other as the inferred basionym of *Trichothyrina sordidula* (v. Höhnel) v. Arx (*sic*). However, the latter should be ascribed solely to v. Arx as required under Art. 72.1 (see Ex. 2). On the basis of our findings in this paper, it seems unlikely, due to its parasitic habit, that *T. sordidula* v. Arx belongs in *Trichothyrina* (recognized here as a synonym of *Micropeltopsis*) but is more appropriately referred to *Actinopeltis* as emended here. The name *T. sordidula* is therefore transferred to *Actinopeltis* as:

Table 1. Comparison of characters of included genera of Trichothyriaceae

Genus and type species	Ascospore septation	Ascospore pigmentation	Free mycelium	Hyperparasites of tropical foliicolous microfungi	Anamorph
Actinopeltella Doidge (1924) *A. nitida* Doidge	1	Hyaline	Absent	Yes	No
Actinopeltis v. Höhn. (1907) *A. peristomalis* v. Höhn.	1	Hyaline	Absent	Yes	No
Actinosoma Syd. (1930) *A. adianti* Syd.	1	Hyaline	Absent	No	No
Caenothyrium Theiss. & H. Syd. (1917) *C. alang-alang* (Racib.) Theiss. & H. Syd.	3	Hyaline	Absent	No (living leaves of *Imperata*)	No
Chaetothyriopsis Stevens & Dorman in Stevens (1927) *C. panamensis* Stevens & Dorman	1	Hyaline	Absent	No (living leaves of *Oncoba*)	No
Loranthomyces sensu v. Höhn. (1917) *L. sordidula* v. Höhn.	1	Hyaline	Absent	Yes	No
Micropeltopsis Vainio (1921) *M. cetrariicola* (Nyl.) Vainio	1	Hyaline	Absent	No (lichenicolous)	No
Mycolangloisia Arnaud (1918) *M. echinata* Arnaud	1	Hyaline	Absent	Yes	No
Trichopeltis Speg. (1889) *T. reptans* (Berk. & M. A. Curtis) Speg.	1	Hyaline	Present	Yes	Yes
Trichopeltopsis v. Höhn. (1909) *T. reptans* (Berk. & M. A. Curtis) Speg.	1	Hyaline	Present	Yes	Yes
Trichothyriella Theiss. (1914) *T. quercigerum* (Berk.) Theiss.	1	Brown	Present	Yes	No
Trichothyrina (Petrak) Petrak (1950) *T. alpestris* (Sacc.) Petrak	1	Hyaline	Slight	No	No
Trichothyriomyces Bat. & Maia in Batista *et al.* (1955) *T. notatus* Bat. & Maia	1	Brown	Present	Yes	Yes
Trichothyriopsis Theiss. (1914) *T. densum* (Racib.) Theiss.	2+	Hyaline	Present	Yes	No
Trichothyrium Speg. (1889) *T. sarciniferum* Speg.	1	Hyaline	Present	Yes	Yes

Actinopeltis sordidula (v. Arx) P. M. Kirk & Spooner, comb. nov.

Trichothyrina sordidula v. Arx in Müller & v. Arx, *Beitr. zur Kryptogamenfl. Schweiz* **11** (2): 559 (1962).

Examination of these, and other genera which required consideration in relation to the fungus on *Laurus*, has indicated that any attempt to rationalize the taxonomy of the Trichothyriaceae based solely on morphology is likely to prove unsatisfactory and will lead inevitably both to the artificial segregation of closely related species and to the inclusion of unrelated species in the same genus. It appears that within this assemblage of minute ascomycetes purely morphological characters are not numerous enough, distinctive enough or stable enough to define workable generic concepts unless they are supplemented by biological or ecological considerations. These include, in particular, the presence or absence of an anamorph, and saprophytic as opposed to parasitic habit on foliicolous microfungi. The data set out in Table 1, which is based either on re-examination of type material or on the published descriptions, suggest that when biological and ecological considerations are included a tenable generic structure may emerge. Genera such as *Trichothyrium* Speg. (Spegazzini, 1889), *Trichopeltis* Speg. (Spegazzini, 1889 = *Trichopeltopsis* v. Höhnel) and *Trichothyriomyces* Batista & Maia (in Batista, Maia & Vital, 1955), which are characterized by the parasitic habit of their members on Meliolaceae or other tropical foliicolous microfungi, as well as by the presence of an anamorph, are probably justifiably distinguished from morphologically similar saprophytic and lichenicolous taxa which lack an anamorph. Similarly, *Actinopeltis*, *Trichothyriella* Theiss. (Theissen, 1914) and *Trichothyriopsis* Theiss. (Theissen, 1914), which are all tropical, apparently mycorparasitic, species for which no anamorph is known may also be considered as generically distinct.

The character of ostiolar setae is omitted from the accompanying table for reasons which are discussed below, as is that of ascospore setulae. This latter character requires further study as the presence of setulae in these fungi (Microthyriaceae *sensu* Eriksson & Hawksworth, 1986) was not recognized until the work of Müller & v. Arx (1962) and it was not considered of generic significance by Ellis (1976,

1977). However, it seems likely that this character will eventually prove to be of taxonomic value, at least at species level, and further observations on setulae are included below.

The presence and disposition of ostiolar setae have commonly been used as characters for the delimitation of genera. Recent authors, notably v. Arx & Müller (1975), Ellis (1977) and Hawksworth (1980*a*, 1982), have emphasized the importance of such setae and paid less attention to spore septation and pigmentation. However, it would appear from the examination of available evidence that the presence of these structures has little taxonomic value at generic level as they are not constantly present, even within species. This has been demonstrated above for the type of *Actinopeltis*, and three further examples can be quoted to justify this conclusion. Firstly, the type of *Trichothyrina* (Petrak) Petrak (1950; based on *Trichothyrium* Speg. subgen. *Trichothyrina* Petrak, 1940), *T. alpestris* (Sacc.) Petrak, was originally described by Saccardo (1880) without reference to setae. It was subsequently redescribed by both Theissen (1914) and Petrak (1940), again without reference to setae, a character which could hardly have been overlooked by these workers. The genus is also stated by v. Arx & Müller (1975) to be glabrous but Ellis (1977), in her monograph of the British species, described convergent ostiolar setae as sometimes present in *T. alpestris*. Secondly, both setose and non-setose collections were reported by Ellis (1977) for *Actinopeltis palustris* J. P. Ell. Finally, as reported by Kirk & Spooner (1989), it is clear from examination of collections in herb. IMI that *Micropeltopsis ammophilae* (see Ellis, 1977, as *Trichothyrina*) 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 are present, sometimes extending beyond the margin of the catathecium. Although presence or absence of ostiolar setae is, therefore, not a reliable taxonomic character, the disposition of these setae does appear to be constant within a species and can, therefore, provide a useful taxonomic character at species level. It is further considered below in the discussion of *Micropeltopsis*.

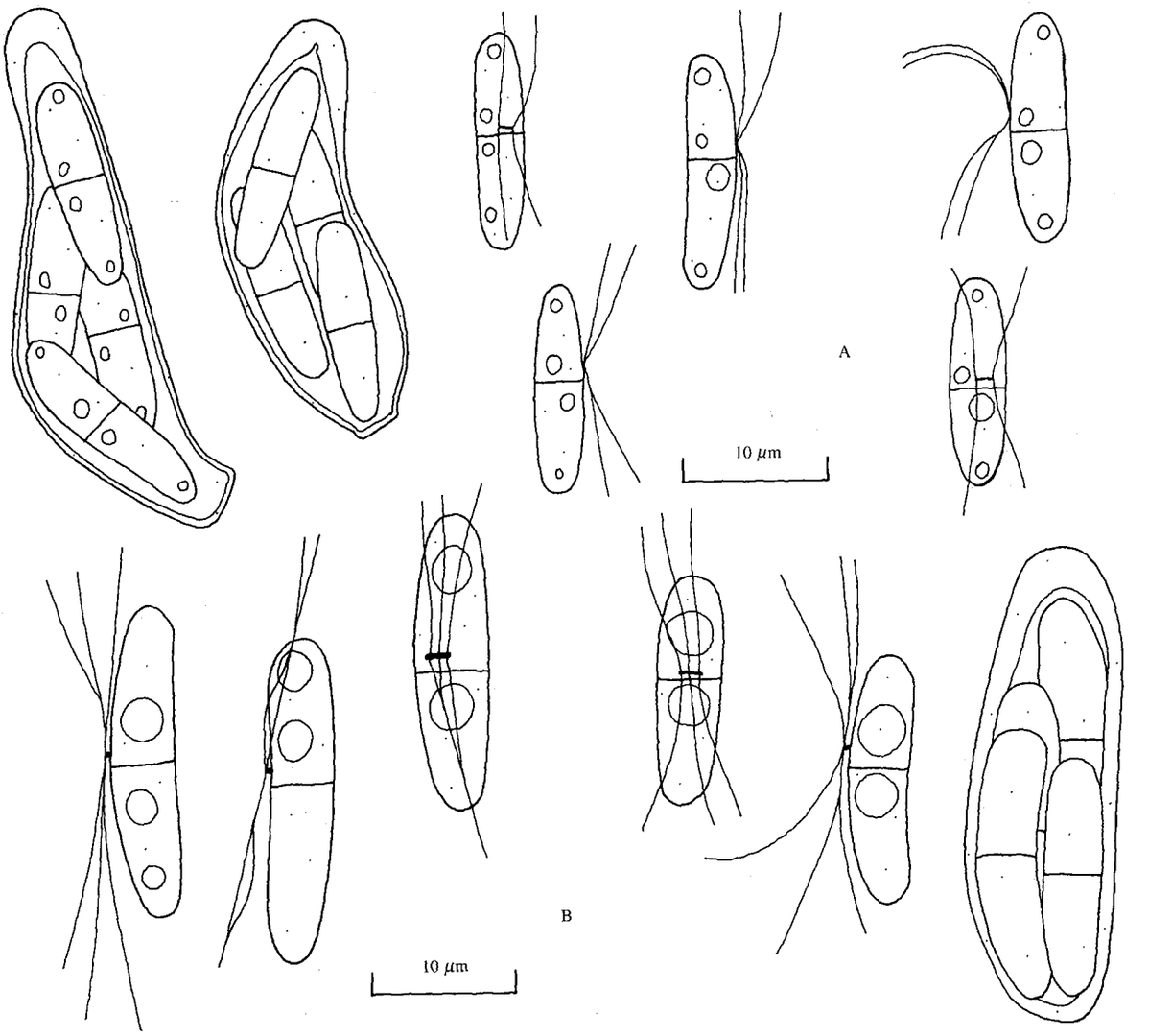
Several genera were cited by v. Arx & Müller (1975) as synonyms of either *Actinopeltis* or *Trichothyrina*, but further study suggests that some of their conclusions are incorrect. Thus, *Halbaniella* Theiss. (Theissen, 1916) and *Pachythyrium* Arnaud (1953, *nom. inval.*, Art. 36.1) were both described as having asci which are vertically arranged in a palisade, *Asteridiellina* Seaver & Toro (in Seaver & Chardon, 1926) lacks a basal plate, and *Dasypyrena* Speg. (Spegazzini, 1921) has collabent ascomata bearing randomly disposed setiform fascicles of hyphae. The position with *Caenothyrium* Theiss. & H. Syd. (Theissen & Sydow, 1917) is less certain. This was placed in synonymy with *Actinopeltis* by v. Arx & Müller (1975) although the original description of the genus clearly states that it lacks a basal plate. However, the description by Raciborski (1900) of the type species of *Caenothyrium*, *Micropeltis alang-alang* Racib., implies that a basal plate is present 'Die Perithecienwand und Perithecienbasis besteht aus einer Schicht, ...'. As we have not seen the type, the presence of this structure remains uncertain. If a basal plate proves to be present, *Caenothyrium* may provide an earlier name for *Chaetothyriopsis*, from which it differs only in ascospore septation.

The type species of *Chaetothyriopsis*, *Trichothyrina* and *Micropeltopsis* all lack an anamorph and are morphologically similar except with regard to ascospore setulae. Examination of isotype material of both *Chaetothyriopsis adianti* and *C. panamensis* did not reveal evidence for the presence of ascospore setulae in either of these species. In contrast, setulae were reported for the type species of *Trichothyrina* by Ellis (1977), although overlooked both in the original description and in that of Petrak (1950). However, it should be noted that this observation by Ellis was not based on an examination of the type collection but described from one of Petrak's specimens. Setulae are also present in the type species of *Micropeltopsis*.

These three genera may also differ with regard to ecology. Thus, *C. panamensis* Stevens & Dorman occurs on living leaves of *Oncoba laurina* in the tropics, whereas *T. alpestris* is a temperate species occurring as a saprophyte on dead culms of *Carex* spp., and *M. cetrariicola* is also a temperate species, occurring on living lichen thalli. However, there is a very close morphological similarity between *Micropeltopsis santessonii* P. M. Kirk & Spooner and the type of *Trichothyrina*, which differ significantly only in ascospore size. It may further be noted that, although the true nutritional requirements of the lichenicolous taxa remain to be determined, they do not appear to be active pathogens. We conclude, therefore, that a lichenicolous versus a saprophytic habit should not be regarded as a character of generic importance. *Trichothyrina* should, on this basis, be considered as a synonym of *Micropeltopsis*. As noted above, *Caenothyrium* and *Chaetothyriopsis* are tropical genera which occur on leaves of living plants and, at present, we prefer to retain these as distinct from *Micropeltopsis*. However, if these characters prove to be taxonomically unimportant at generic level, *Caenothyrium* will provide an earlier name for *Micropeltopsis*.

Micropeltopsis cetrariicola (Nyl.) Vainio was redescribed by Hawksworth (1980*a*) based on an examination of the holotype and a later collection from Scotland. This species lacks ostiolar setae and Hawksworth, following Ellis (1977), who placed no taxonomic value at generic level on the absence of ostiolar setae, united *Micropeltopsis* with *Trichothyrina*, but was incorrect in doing so under the latter name. We have re-examined the slides prepared by Hawksworth from the holotype of *M. cetrariicola*, which are now in poor condition, and have also re-examined the Scottish collection cited by Hawksworth and an additional collection issued by Santesson in *Fungi Lichenicoli Exsicca'ti* No. 22. These all represent the same species, and agree with the description given by Hawksworth (1980*a*) except with regard to ascospore setulae. Setulae have not been observed on the few spores present on the poorly preserved slides of the holotype, but are clearly present in the other two collections. An emended description follows.

Fig. 1. A, *Micropeltopsis cetrariicola*, asci and ascospores; B, *Micropeltopsis peltigericola*, asci and ascospores.



Micropeltopsis cetrariicola (Nyl.) Vainio, *Acta Soc. Fauna Flora fenn.* **49** (2): 218 (1921). (Fig. 1A)

Sphaeria cetrariicola Nyl. in Norrlin, *Not. Sällsk. Fauna Flora fenn. Förh.* **13**: 323 (1874).

Ascomata catathecioid, 80–160 μm diam, rather flattened clypeiform, *ca* 20–40 μm high, appearing black by reflected light, the upper layer one cell thick and composed of radially-arranged brown to dark brown quadrangular cells *ca* 4–7 × 3–5 μm, ostiolate, ostiole central, raised, forming a collar 2–3 cells high composed of dark brown cells with thickened, lateral walls; basal layer of similar construction to upper layer, one cell thick; margin entire. *Asci* 25–36 × 8–12 μm, ovoid to obclavate, 4-spored. *Ascospores* (12·5–) 14–16 × 2·5–3·5 (–4·0) μm, ellipsoid, hyaline, smooth, with a single median septum, the upper cell bearing 4 setulae, each 5–9 μm long, arranged in two pairs attached near the septum, the point of attachment forming a raised, staining (lactofuchsin) transverse structure *ca* 1·0 × 0·3 μm on the ascospore wall, two setulae arising from each side.

Specimens examined: Finland, Enontekio, Ounastunturi, on *Cetraria islandica* (L.) Ach., 1870, J. P. Norrlin (H-NYL 3713), holotype of *Sphaeria cetrariicola*; U.K., Aberdeenshire, Braemar, Ben-nabuird, on *C. islandica*, J. M. Crombie (K); Sweden, Are par., Mt Skurdalshöjden, nr Storlien, on *C. islandica*, 28 July 1950, R. Santesson (*Fungi Lichenicoli Exsiccati* No. 22), IMI 292394.

Another lichenicolous species, *Actinopeltis peltigericola* D. Hawksw., described by Hawksworth (1982) based on collections from Cyprus (holotype) and the British Isles, was essentially distinguished from *M. cetrariicola* by the presence of ostiolar setae. It was initially considered by Hawksworth to be congeneric with the latter (Hawksworth, 1980*b*). As described, these two taxa also exhibit small differences in ascospore size and in dimensions of the catathecia. However, re-examination of the holotype collection of *A. peltigericola*, and of the paratype from Shropshire, has revealed the presence of distinct setulae on the ascospores. Three setulae arise from each side of a raised, deep-staining (lactofuchsin) transverse structure *ca* 1·0 × 0·3 μm on the uppermost cell of the ascospore. In the holotype, this structure is situated close

to the septum but, in the examined paratype, its position is variable between the mid-point of the cell and the septum. The species is clearly congeneric with *M. cetrariicola*, and the combination in *Micropeltopsis* is proposed and a revised description given below.

Micropeltopsis peltigericola (D. Hawksw.) P. M. Kirk & Spooner, comb. nov. (Fig. 1B)

Actinopeltis peltigericola D. Hawksw., *Notes R. bot. Gdn Edinburgh* **40**: 375 (1982).

Ascomata catathecioid, 50–70 µm diam, depressed hemisphaerical, *ca* 25–40 µm high, appearing black by reflected light, the upper layer one cell thick, composed of radially-arranged brown to dark brown quadrangular cells *ca* 3–4 × 3–4 µm, ostiolate, ostiole central, raised, forming a collar 2–3 cells high, composed of cells 5–6 µm diam with dark brown, thickened lateral walls, with 3–6 equidistant apical cells extended into a crown of divergent setae forming an inverted cone over the ostiole; basal layer of similar construction to upper layer, one cell thick; margin entire. *Setae* 12–35 × 3–4 µm, dark-brown, thick-walled, non-septate, smooth. *Asci* 25–35 (–40) × 9–11 µm, ovoid to obclavate, 4-spored. *Ascospores* (13·5–) 15–22 × 3·5–4·5 µm, ellipsoid, hyaline, smooth, with a single median septum, the upper cell bearing 6 setulae, each 11–18 µm long, arranged in three pairs attached near the septum, the point of attachment forming a raised, deep-staining (lactofuchsin) transverse structure *ca* 1·0 × 0·3 µm on the ascospore wall, three setulae arising from each side.

Specimens examined: Cyprus, Division 2, Mt Tripylas, near road from Stavros to Kykko, 18 Apr. 1979, J. R. Edmondson & M. A. S. McClintock (E. 2841), IMI 262877 (holotype); U.K., Shropshire, Stiperstones, The Bog, on underside of living thallus of *Peltigera rufescens* (Weis) Humb., 26 Oct. 1980, O. L. Gilbert, IMI 253192.

A collection referred to *Actinopeltis peltigericola* by Santesson (*Fungi Lichenicoli Exsiccati* No. 4) proves to differ from this species and to represent an undescribed taxon. The following name is introduced to acknowledge Dr R. Santesson, who collected the type specimen.

Micropeltopsis santessonii P. M. Kirk & Spooner, sp. nov. (Fig. 2)

Ascomata catathecioid, 100–160 µm diam, ostiolata, marginis respectu integra, complanata clypeata, *ca* 40–60 µm alta, parie quaeque induta duobus e striatis composito quorum superior habet cellulas radialiter dispositas, rubrobrunneas ad fusco-rubrobrunneas et inferior superiori simile sed pallidior, quadrangulas, 4–6 × 3–5 µm, ostiolum centrale, elevatum, parvis e cellulis compositum quibusque muris fuscobrunneis incrassatis lateralibus indutis, coronam gerens setarum convergentium. *Setae* (15–) 18–34 (–40) × 3·5–5 µm, subulatae, atro-rubrobrunneae, crassitunicatae, non septatae, laeves. *Asci* 36–50 × 9–12 µm, ovoidei ad obclavati, octospori. *Ascosporae* (12–) 16–20 × 2·5–3·5 µm, ellipsoideae, hyalinae, laeves, septo unico in medio quaeque indutae, setulae absens.

Sweden: Västmanland; Sala, in *Peltigerae caninae*, 28 Oct. 1958 et 1 Nov. 1958, R. Santesson (n. 12676 et 12691) (*Fungi Lichenicoli Exsiccati* No. 4), IMI 292376, holotypus.

Ascomata catathecioid, 100–160 µm diam, rather flattened clypeiform, *ca* 40–60 µm high, appearing black by reflected light, the upper layer one cell thick, composed of radially-arranged reddish-brown to dark reddish-brown quadrangular cells *ca* 4–6 × 3–5 µm, ostiolate, ostiole central, raised, forming a collar 2–3 cells high, composed of small cells with dark brown, thickened lateral walls, bearing a crown of convergent setae forming a cone over the ostiole; basal layer of similar construction to upper layer, one cell thick, paler; margin entire. *Setae* (15–) 18–34 × 3·5–5 µm, subulate, dark reddish-brown, thick-walled, non-septate, smooth. *Asci* 36–50 × 9–12 µm, ovoid to obclavate, 8-spored. *Ascospores* (12–) 16–20 × 2·5–3·5 µm, ellipsoid, hyaline, smooth, with a single median septum, lacking setulae.

There is one other British species, currently referred to *Actinopeltis sensu* Ellis, which requires redisposition in the light of the above conclusions. *Actinopeltis palustris*, described from dead culms of *Phalaris arundinacea*, is a species of *Micropeltopsis* as emended here, and the appropriate combination is proposed:

Micropeltopsis palustris (J. P. Ell.) Spooner & P. M. Kirk, comb. nov.

Actinopeltis palustris J. P. Ell., *Trans. Br. mycol. Soc.* **68**: 153 (1977).

Ellis (1977) recognized nine British species of *Trichothyrina*. Of these, only *T. parasitica* (Fabre) v. Arx, does not appear to belong in *Micropeltopsis*. This species occurs as a parasite on stromata of various species of Diatrypaceae and has turbinate ascomata with vertically-arranged asci. The name *Pachythyrium* was introduced for this species by Arnaud (1953) but, as noted above, was not validly published. The taxonomic decision to recognize this new genus appears to be sound and, therefore, we validate the name here.

Pachythyrium Arnaud ex Spooner & P. M. Kirk, gen. nov.

Fungus ad Trichothyriaceae pertinens stromata Diatrypacearum habitans. *Ascomata* plano-turbinata, ostiolata, cum pariete et superiori et inferiori cellulis radialiter dispositis induto. *Asci* bitunicati, recte dispositi. *Ascosporae* hyalinae, uniseptatae, setulatae.

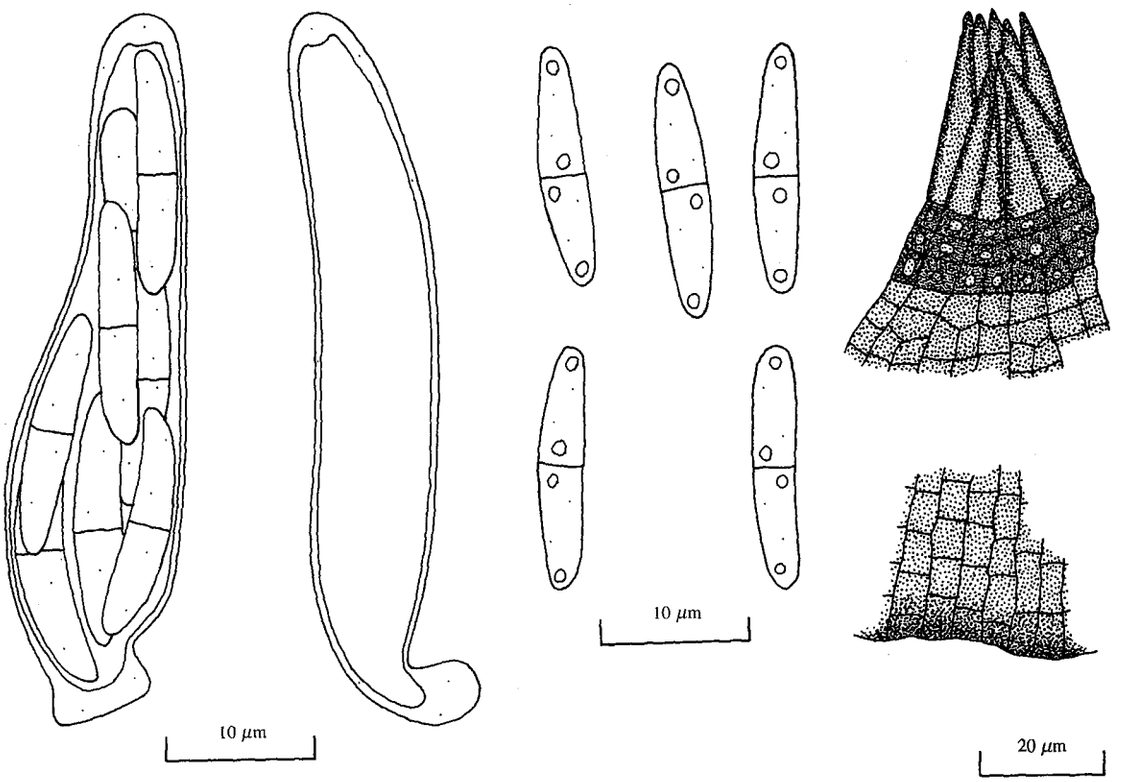
Sp. typ.: *Bertia parasitica* Fabre, holotypus.

Pachythyrium parasiticum (Fabre) Arnaud ex Spooner & P. M. Kirk, comb. nov.

Bertia parasitica Fabre, *Ann. Sci. nat., Bot.*, sér. 6, **9**: 95 (1878).

Due to their close morphological similarity, we have been unable to distinguish satisfactorily between collections referred to *T. alpestris* and *T. cupularum* J. P. Ell., and between those referred to *T. nigroannulata* (Webster) J. P. Ell. and *T. salicis* J. P. Ell. (Ellis, 1977). The latter two taxa are also closely similar to *T. pinophylla* J. P. Ell., which differs in having asci which are sometimes 4-spored, in having slightly smaller catathecia and in occurring exclusively on conifer needles. The species limits of these taxa are difficult to define due to the restricted number of collections available for study and, at present, we refrain from proposing combinations in *Micropeltopsis* for *T. cupularum* and *T. salicis*. Combinations for the remaining five species are proposed, based on an examination of relevant material in herb. IMI and K.

Fig. 2. *Micropeltopsis santessonii*, catathecium ostiole and margin, asci and ascospores.



Micropeltopsis alpestris (Sacc.) Spooner & P. M. Kirk, comb. nov.

Microthyrium alpestre Sacc., *Michelia* **2**: 160 (1980).

Trichothyrina alpestris (Sacc.) Petrak, *Sydowia* **4**: 167 (1950).

Micropeltopsis fimbriata (J. P. Ell.) P. M. Kirk & Spooner, comb. nov.

Trichothyrina fimbriata J. P. Ell., *Trans. Br. mycol. Soc.* **68**: 148 (1977).

Micropeltopsis nigroannulata (Webster) Spooner & P. M. Kirk, comb. nov.

Microthyrium nigroannulatum Webster, *Trans. Br. mycol. Soc.* **35**: 208 (1952).

Trichothyrina nigroannulata (Webster) J. P. Ell., *Trans. Br. mycol. Soc.* **68**: 149 (1977).

Micropeltopsis norfolciana (J. P. Ell.) P. M. Kirk & Spooner, comb. nov.

Trichothyrina norfolciana J. P. Ell., *Trans. Br. mycol. Soc.* **68**: 150 (1977).

Micropeltopsis pinophylla (v. Höhn.) Spooner & P. M. Kirk, comb. nov.

Leptopeltella pinophylla v. Höhn., *Annls mycol.* **15**: 305 (1917).

Trichothyrina pinophylla (v. Höhn.) Petrak, *Annls mycol.* **38**: 365 (1940).

A key to distinguish the British species of this genus is given below.

Key to British species of Micropeltopsis

1. Species lichenicolous 2
1. Species on decaying plant material 4
2. Growing on species of *Peltigera*; ostiolar setae present 3
2. Growing on species of *Cetraria*; ostiolar setae absent . . . . . *M. cetrariicola*
3. Ostiolar setae convergent, forming a well-defined cone; catathecia > 100 μm diam. . . . . *M. santessonii*
3. Ostiolar setae divergent, forming an inverted cone; catathecia < 70 μm diam. . . . . *M. peltigericola*
4. Margin of catathecia fimbriate; ostiolar setae and ascospore setulae absent 5
4. Margin of catathecia entire, non-fimbriate; ostiolar setae and ascospore setulae present or absent 6
5. Ascospores 1-septate; catathecia < 100 μm diam; on conifer needles . . . . . *M. fimbriata*
5. Ascospores 1–6-septate; catathecia > 200 μm diam; on leaves of *Carex* spp. . . . . *M. norfolciana*
6. Ascospore setulae present; ostiolar setae commonly present 7
6. Ascospore setulae absent; ostiolar setae absent. 9

7. Ostiolar setae convergent, typically forming a cone; cells of ostiolar collar with thickened, dark brown lateral walls appearing as a ring of holes . . . . . *M. alpestris*
7. Ostiolar setae divergent; cells of ostiolar collar not appearing as a ring of holes 8
8. Catathecia < 70 µm diam; ostiolar setae disposed horizontally . . . . . *M. ammophilae*
8. Catathecia 100–160 µm diam; ostiolar setae forming an inverted cone . . . . . *M. palustris*
9. Asci sometimes 4-spored; catathecia on conifer needles. . . . . *M. pinophylla*
9. Asci 8-spored; catathecia on various hosts . . . . . *M. nigroannulata*

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Note added in proof:

Our attention has been drawn to a recently published paper by Santesson (*Nordic Journal of Botany* **9** (1): 97–99, 1989) who placed *Micropeltopsis* Vainio (1921) as a synonym of *Lichenopeltella* v. Höhnel (1919). However, the application of the name of the generic type of *Lichenopeltella* appears to be uncertain. The holotype, which we have examined, includes two fungi and the description is based on both of these. We, therefore, refrain from taking up this earlier name and will discuss it elsewhere.

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