

## Some pteridicolous Ascomycetes

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In the course of an inventory of the Ascomycetes found on ferns in Sweden a number of morphological and taxonomic problems were encountered. 16 species are commented on and the following new names are published: Discomycetes: *Cryptomycina filicina* (Fr.), *Naevula perexigua* (Rob. ex Desm.), *Nannfeldtia phegopteridis* sp. nov., *Pseudopeltis* gen. nov., *Pseudopeltis filicum* sp. nov. - Pyrenomycetes unitunicati: *Glomerella polypodii* (Rbh.), *Monographos fuckelii* nom. nov., *Monographos minor* sp. nov., *Mycoglaena filicina* sp. nov. - Pyrenomycetes bitunicati: *Schizothyrium speireum* (Fr.), *Scirrhia osmundae* (Peck & Clinton), *Trichothyria filicum* sp. nov. Lectotypes are proposed for *Cryptomycina filicina* and *Monographos fuckelii*. The genera *Metameris* and *Scirrhodothis* are included in *Scirrhia*, because they possess an ascocarp centrum of *Dothidea*-type.

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Ferns in general harbour a rich and specific mycoflora. This holds true not only for parasitic fungi, such as *Taphrina* and the rust genera *Hyalopsoara*, *Milesia* and *Uredinopsis*, but also for saprophytes, the group which concerns us here. Some ferns, such as *Osmunda* and *Pteridium*, are hosts for very specific fungi only, whereas species of *Athyrium*, *Dryopteris* and *Matteuccia* seem to harbour much the same mycoflora. These fungi have on the whole been little studied, although the keen-eyed Mme Libert had already paid them some attention. Bubák also deserves mention, for his excellent paper of 1916.

As a part of our investigation of Swedish micro-fungi, especially the Pyrenomycetes, we have included a study of this particular substrate. A previous paper (Holm & Holm 1977) concerned the Leptopeltidaceae. This is a mainly pteridicolous family, which includes some of the most important species of the fungal flora found on ferns. The present paper deals with some new or otherwise noteworthy species within various Ascomycete groups. It is based mainly on material, collected by us (now in

UPS). We have also revised the pertinent material in S and UPS; some type specimens were obtained on loan from B, BR, and K. Our sincere thanks are due to the curators of these institutions.

### Discomycetes

*Cryptomycina filicina* (Fr. ex Fr.) L. & K. Holm, comb. nov.

*Leptostroma filicinum* Fr. ex Fr., Syst. Mycol. 2: 599 (1823) - *Leptostroma filicinum* Fr., Obs. Mycol. 1: 197 (1815) - Lectotype: Fr., Scler. succ. 65 (UPS).

*Cryptomycina Osmundae* H. Sydow, Ann. Mycol. 21: 174 (1923) - Type: Germany, Silberg in Westphalen, *Osmunda regalis*, V. 1923, Ludwig (= Syd., Myc. germ. 1928, UPS).

*Cryptomycina Osmundae* (Schw.) Petrak, Sydowia 10: 298 (1957), nom. illeg. - *Hysterium Osmundae* Schweinitz, Trans. Amer. Phil. Soc. ser. 2, 4: 246 (1834) - Type: USA, Penn., "In stipitibus *Osmundae spectabilis*, Salem et Bethl." (n.v.).

Fig. 1 D, 2 A, B.

This fungus is apparently confined to the dead stipes of *Osmunda* and is very conspicuous because of its large black stromatic crusts,

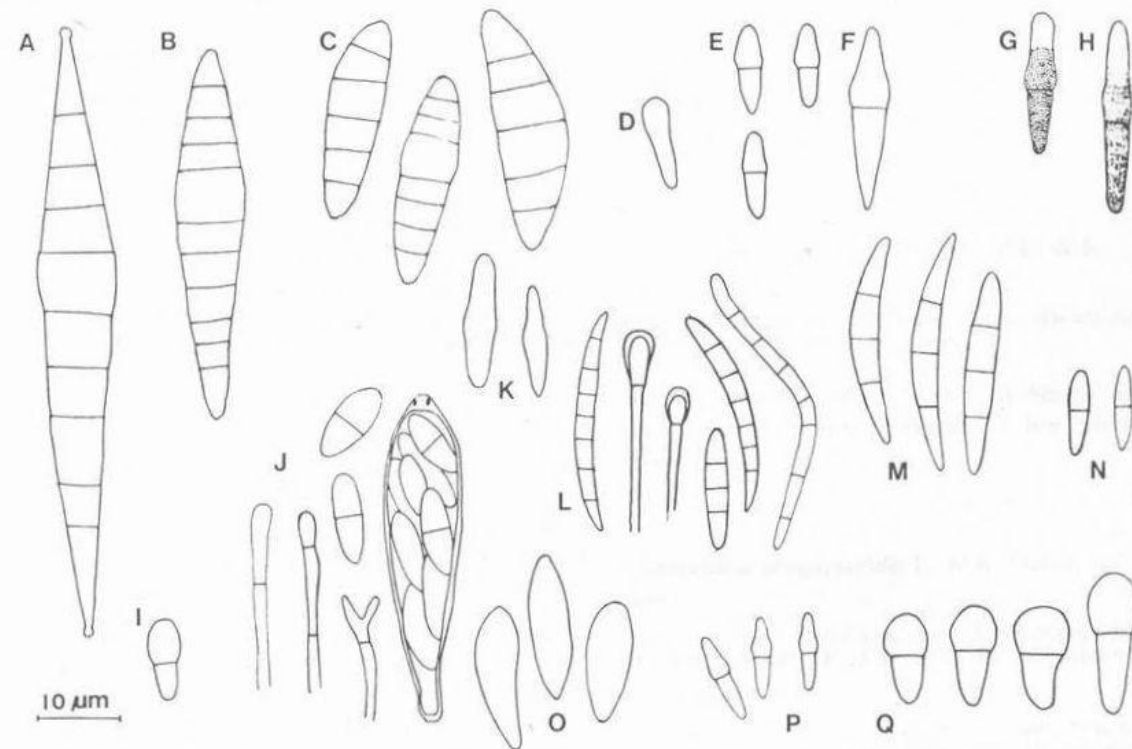


Fig. 1. Spores. - A: *Dangeardiella macrospora*. - B: *Dangeardiella fusiforma*, aberrant form. - C: *D. fusiforma*. - D: *Cryptomycina filicina*. - E: *Scirrhia aspidiorum*. - F: Ditto, large-spored form on *Pteridium*. - G: *Scirrhia osmundae*. - H: "*Metameris japonica*". - I: *Morenoina* sp. - J: *Pseudopeltis filicum*, ascus, spores and paraphyses. - K: *Botryosphaeria* sp. - L: *Nannfeldtia phegopteridis*, spores and paraphyses. - M: *Monographos fockelii*. - N: *M. minor*. - O: *Glomerella polypodii*. - P: *Trichothyria filicum*. - Q: *Hysteropeltella moravica*. - All  $\times 1000$ .

which attain 1 cm or more in length. For a full description see Sydow (1923). The asci have an apical ring which is I+.

In spite of its striking appearance this species has so far been little noticed and in fact may be rare. However, it had already been found by Fries, as Bubák (1916), who investigated the original material of *Leptostroma filicinum* Fr., made clear. Bubák concluded that the fungus "keine Leptostromacee ist, sondern ein Askomyzet" (1916 p. 312), although he did not discuss its taxonomy more closely in that article because he intended to treat the pteridicolous ascomycetes in a later paper, which unfortunately never was realized. We can verify his statement that Fries's fungus is an ascomycete, and we identify it with *Cryptomycina osmundae*, described more than a century after Fries by Sydow, who did not, however, refer to Bubák's paper.

We think it is appropriate to lectotypify *Leptostroma filicinum* by Fries's Scler. succ. no. 65, which fixes the name in the sense adopted here. When validly publishing *Leptostroma filicinum* in 1823, Fries apparently included various fungi under this name, since he listed several host plants: "in stipitibus Pteridis, Osmundae regalis, Aspidiorum etc." (p. 599). In the original publication, however, the Royal fern is the only host plant to be mentioned specifically: "In stipitibus Osmundae regalis Etc." (Fries 1815 p. 197), and it seems reasonable to infer that Fries considered *Osmunda* to be the principal host.

We found the fungus in abundance in the only *Osmunda* locality which we visited, viz. Sweden, Gästrikland, Hille par., Brännsågen, at the rivulet Testeboån, 21.V.1975, 562 b.

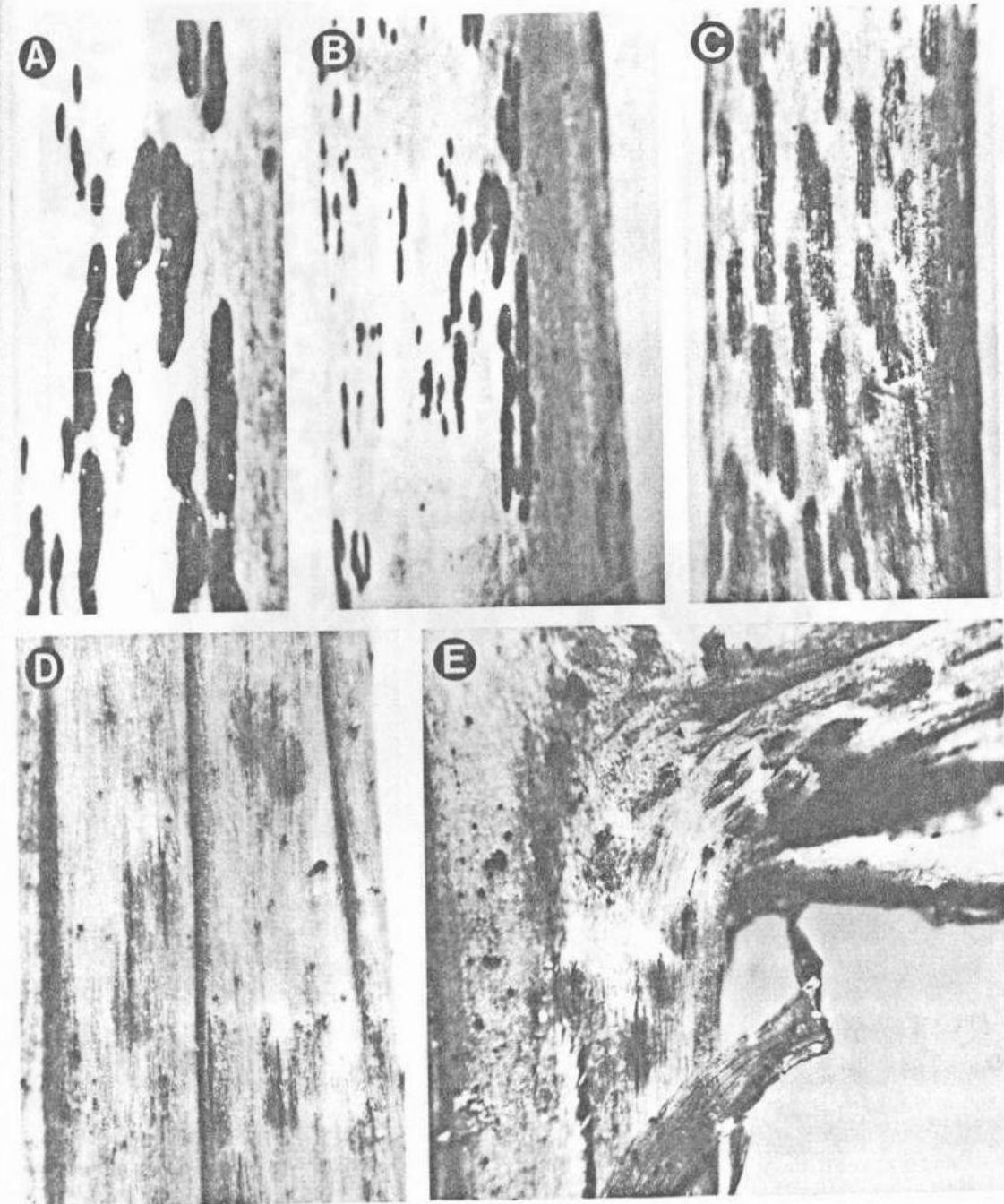


Fig. 2. Ascocarps in surface view. - A: *Cryptomycina filicina*,  $\times 9$ . - B: Idem,  $\times 4.5$ . - C: *Scirrhia osmundae*,  $\times 9$ . - D: *Dangeardiella fusiforma*,  $\times 18$ . - E: Idem,  $\times 18$ .



**Hysteropeltella moravica** Petrak

Petrak, Ann. Mycol. 21: 10 (1923) – Type: Moravia, pr. Podhorn, *Dryopteris filix-mas*, IV. 1922 (W?).

Fig. 1 Q, 4 C, 8 A.

*Ascocarps* densely scattered, erumpent, linear, usually 0.2–0.5 mm in length, c. 0.1 mm broad and 50  $\mu\text{m}$  high, opening by a longitudinal slit. *Peridium* c. 20  $\mu\text{m}$  broad, of textura angularis, cells 6–10  $\mu\text{m}$ . *Asci* numerous, subglobose or oblong to clavate, sessile, 30–36  $\times$  12–15  $\mu\text{m}$ , 8-spore, bitunicate? with truncate apex. Ascus wall strongly thickened at apex, turning blue with iodine. *Spores* irregularly arranged,  $\pm$  cuneiform, bicellular usually with a somewhat suprmedian septum, long hyaline and 11–13  $\times$  5  $\mu\text{m}$ , eventually up to 15  $\times$  5  $\mu\text{m}$  and the thick spore wall turning brownish. *Interthecial threads* 0.

No type material was available but we have no hesitation in identifying our fungus with Petrak's; his detailed description matches our material perfectly, although he did not notice the I reaction, nor did he observe the fully mature, brownish spores. On the other hand, he reported that the asci are surrounded by "spärlichen, undeutlich faserigen Paraphysoiden". We have not seen any interthecial threads.

Petrak established the genus *Hysteropeltella* for this fungus, which certainly merits a genus of its own. He considered it to be a "typische Hypodermiee", which it definitely is not. We think that the ascus characters indicate a kinship with the Lecideaceae, and *Hysteropeltella* may lie not far distant from e.g. *Melaspilea emergens* (Fr.) Rehm.

The fungus is not very conspicuous but it seems quite characteristic and can be recognized even under a hand-lens by its elongate streak-shaped apothecia, which open by a longitudinal slit when wet.

Up to now this species was only known from the type collection, but it seems to be rather common on the petioles of larger ferns. We now have eight collections, in some of which the fungus occurs in abundance.

Sweden: Uppland, Dalby, c. 500 m SW of Högby, in spruce forest, *Athyrium filix-femina*, 27.IV.1975, 477 c. – pr. "Jerusalem", *Dryopteris spinulosa*, 11.VI. & 16.VI.1976, 861a & 873b. – Uppsala-Näs, 700 m W of Högby, *Dryopteris filix-mas*, 27.IV.1975, 479c. –

Ekeby, c. 3 km S of the N end of lake Vällen, spruce forest, *Matteuccia struthiopteris*, 9.V.1975, 507 b and 16.VII.1976, 904 a. – Dalarna, Vika, pr. Trostbäcken, *Matteuccia struthiopteris*, 20.V.1975, 574c. – Gästrikland, Gävle, Lövudden, *M. struthiopteris*, 20.V.1975, J. A. Nannfeldt 23912.

**Naevata perexigua** (Rob. ex Desm.) L. & K. Holm, comb. nov.

*Phacidium perexiguum* Roberge ex Desmazières, Ann. Sci. Nat. Bot. ser. 3, 11: 362 (1849).

For comments, see under *Schizothyrium speireum*. (*Naevata perexigua* is not pteridicolous!)

**Nannfeldtia phegopteridis** L. & K. Holm, sp. nov.

Typus: Suecia, Dalecarlia, par. Stora Kopparberg, Finnbo, 27.V.1977. K. & L. Holm no. 1057a (UPS).

Fig. 1 L, 4 D, 7 A.

*Apothecia* solitaria vel  $\pm$  gregaria, saepe bina confluentia, superficialia atra, scutata, 150–250  $\mu\text{m}$  diam., maturitate c. 50  $\mu\text{m}$  alta. *Scutellum* centro  $\pm$  stellatum dehiscens, ex hyphis coalitis radiatim dispositis. *Excipulum* laterale parum evolutum e textura globulosa cellulis minutissimis; excipulum basale 0 sed substrati cellulae subjectae 'hypostrorate' repletae. *Asci* cylindrico-clavati, brevis stipitati, 65–75  $\times$  10–12  $\mu\text{m}$ , apice rotundati, annulo minuto ope lodi caerulescenti, octosporae. *Sporae* octonae, parallelae, filiformes, basim versus saepe subattenuatae, (20–)25–35(–40)  $\times$  2.5–3.5  $\mu\text{m}$ , numero cellularum valde variabili sed saepe 7-septatae, hyalinae. *Paraphyses* ascos subaequantur, septatae, cellula terminali ad 4  $\mu\text{m}$  inflata, membrana incrassata.

Habitat in petiolis anni praeteriti *Lastreae phegopteridis*.

This species, like the next one, provides a new example of a superficial Discomycete which externally resembles one of the Microthyriales, cf. Nannfeldt (1976 a). Though similar in many respects, they are probably a heterogeneous assemblage. A characteristic common trait is the presence of a  $\pm$  superficial shield, which covers the developing apothecium. The shield texture varies a great deal. In the present species it consists of one layer of radiate, coalescent hyphae; in surface view the cells are almost square at the centre of the shield, elongate and often ramified towards the margins (Fig. 7 A).

At maturity the shield cracks centrally, its

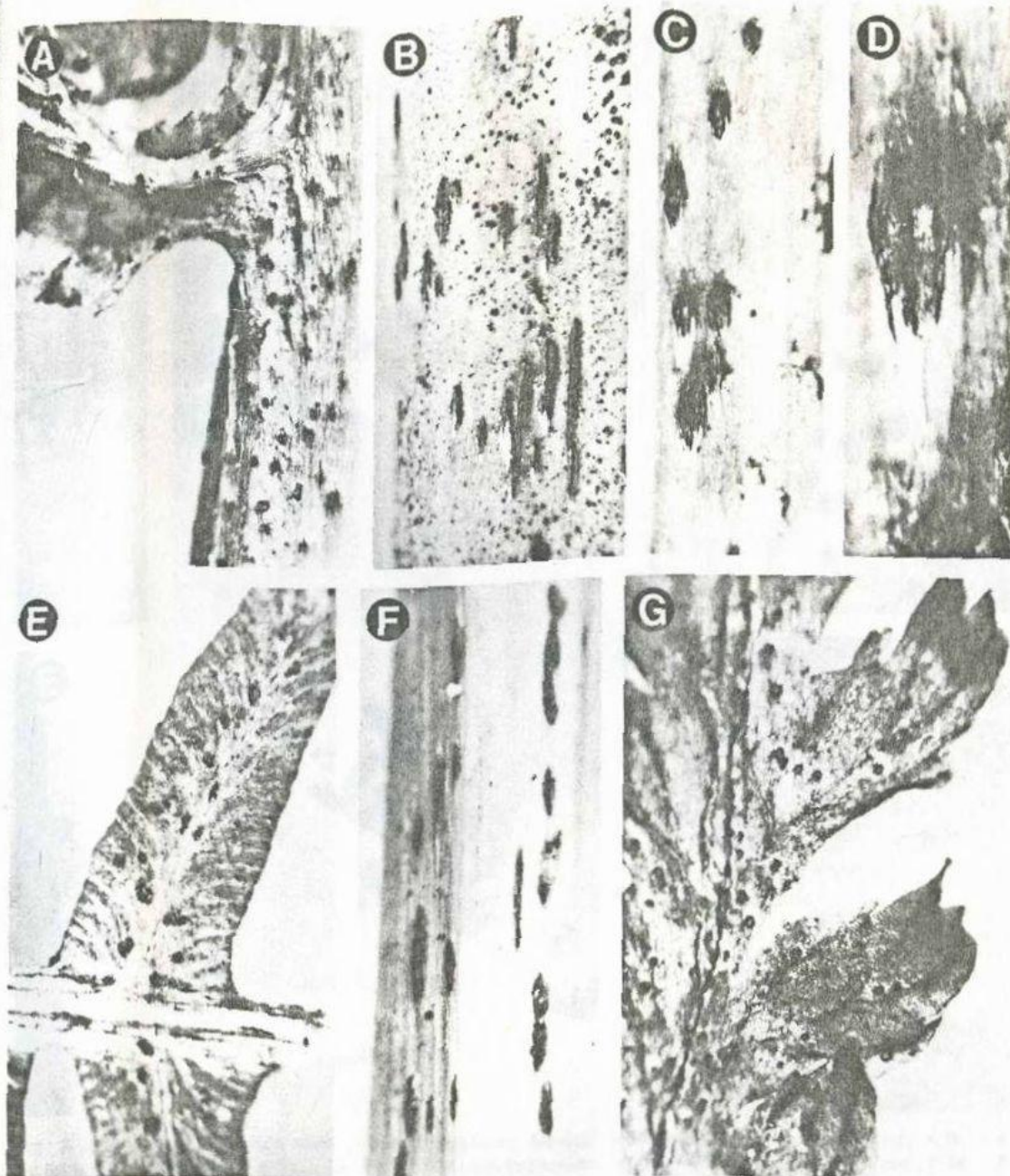


Fig. 3. Ascocarps in surface view. – A: *Scirrhia aspidiorum*,  $\times$  18. – B: Idem,  $\times$  9. – C: *Dangeardiella macrospora*,  $\times$  9. – D: Idem,  $\times$  36. – E: *Monographos fockelii* in leaflets,  $\times$  9. – F: Idem in petiole,  $\times$  9. – G: *Monographos minor*,  $\times$  18.

remnants adhering to the hymenial surface like an epithecium. The peripheral part of the shield is firmly attached to the excipulum, which is poorly developed, especially basally, where it is replaced by an intracellular 'hypostroma'.

*N. phegopteridis* is easily recognized by its filiform, pluriseptate spores; the number of cells per spore is quite variable, from 4 to 12, but 8 seems to be the most common number.

We suggest, although with some hesitation,



that the species be accommodated in *Nannfeldtia*, a genus so far comprising only the type species, *N. atra* Petrak, found on dead leaves of *Carex firma*. There are evident resemblances in the asci, paraphyses and shield structure. It is true, though, that the shield has a distinct, circular margin in *N. atra*, while it grades irregularly into a sparse, superficial mycelium in *N. phegopteridis*. The spores are certainly very dissimilar, but this difference is hardly an essential one: cf. the discomycete genus *Lachnelula* s. lat., whose spores also vary widely, but which, nevertheless, is a very natural genus.

*Microthyrium phegopteridis* Magnus (in Abh. Nat.-Hist. Ges. Nürnberg 16: 262, 1906) might be a possible synonym, though improbable, since that fungus is said to occur on the leaflets of *Lastrea phegopteris* – we have never found our species on any other substrate than the petioles. *Microthyrium phegopteridis* was described on the basis of immature material (not seen by us), bearing no spores of any kind; we rather think that it belonged to a *Leptothyrium*, which is common on the lamina of this host.

*Nannfeldtia phegopteridis* is probably common in Scandinavia and is not seldom found in abundance. We have 6 collections from Sweden, Dalarna, and one from Norway, Møre og Romsdal. The petioles of *Lastrea phegopteris* are often heavily infested by *Leptopeltis gregaria* (cf. Holm & Holm 1977) and these two species seem to be ± vicarious.

An apparently related fungus is present in a collection of *Matteuccia struthiopteris* (Sweden, Gävle, Lövudden, 20.V.1975, J. A. Nannfeldt 23912e). Unfortunately the material is scanty and immature.

***Pseudopeltis* L. & K. Holm, gen. nov.**

Typus: *Pseudopeltis filicum*.

Genus novum Discomycetum ex affinitate dubia sed textura scutelli Leptopeltidi persimile: ab illo genere differt i.a. paraphysibus veris.

***Pseudopeltis filicum* L. & K. Holm, sp. nov.**

Typus: Suecia, Uplandia, par. Dalby, in loco c. 200 m ab villa "Jerusalem" inter septentriones et occasum solis spectante, in laminis siccis Dryopteridis filicis-maris, 10.VI.1976, K. & L. Holm no. 854b (UPS).

Fig. 1 J, 4 G, 7 B.

*Apothecia* sparsa, amphigena, subcuticularia, dis-

coidea, 0.1–0.3 mm diam., c. 50 µm alta, scutello radiato stellatim fissis e cellulis serialiter dispositis desuper visis subquadratis, c. 5 µm latis. *Asci* cylindrico-clavati, brevissime stipitati, c. 40 × 10 µm, octospori, annulo apicali ope Iodi et solutione KOH caerulescenti, apice leniter acuti pariete incrassato. *Sporae* anguste ellipsoideae, vulgo 10–12 × 3.5–4 µm, bicellulares, hyalinae, pluriguttulatae. *Paraphyses* univulvis biseptatae, saepe ramosae, apice incrassatae. *Excipulum* proprium nullum, hypothecium vix evolutum.

Habitat in lamina foliorum emortuorum filicum.

The scutellate, ± superficial *Discomycetes* have been much neglected and misunderstood, cf. the preceding species. The present fungus is an extreme representative of that group, in which the excipulum is virtually absent, being replaced by the scutellum. The structure of the latter is strongly reminiscent of *Leptopeltis*, hence the generic name.

This highly-reduced species hardly fits into any genus so far described, but it is possibly related to the Naevioideae. In general appearance the mature, opened apothecia are similar to *Naevula perexigua* (= *N. minutissima*) and the microscopic characters are also compatible with that group. The resemblance with *Leptopeltis* may be more than a mere coincidence, but the centrum structure is different, cf. Holm & Holm (1977 p. 216). A kinship with *Phacidina gracilis*, on *Lycopodium*, although conceivable, would be rather remote.

Of course, *Pseudopeltis filicum* is easily overlooked, but we do not have the impression that it is a common fungus. So far we have only seen it on laminae, never on petioles. Apart from the very rich type collection we only have 3 other packets of rather scanty material:

Sweden: Upland, Dalby, c. 500 m SE of 'Jerusalem', *Dryopteris filix-mas*, 15.VI.1975, 590b. – Dalarna, Garpenberg, Realsbo, *D. spinulosa*, 29.III.1974, 350. – Sundborn, pr. Mjölmarvallen, *Athyrium filix-femina*, 22.VI.1974, 275d.

***Pyrenomyces unitunicati***

***Glomerella polypodii* (Rbh.) L. & K. Holm, comb. nov.**

*Sphaeria Polypodii* Rabenhorst, Herb. Mycol. II: 533 (1857) – *Plectosphaeria polypodii* von Arx & Müller 1954 p. 208 – Type: Germany, Saxony, *Polypodium vulgare*, 1856, leg. Rbh. (= Herb. Myc. II: 533, B!).

*Laestadia Polypodii* Sacc. & Magnus ap. Sacc. & Berl., Atti Ist. Ven. Sci. Lett. Arti ser. 6, 3: 737 (1884) – Type: Italy, Albano, leg. Magnus (S!).

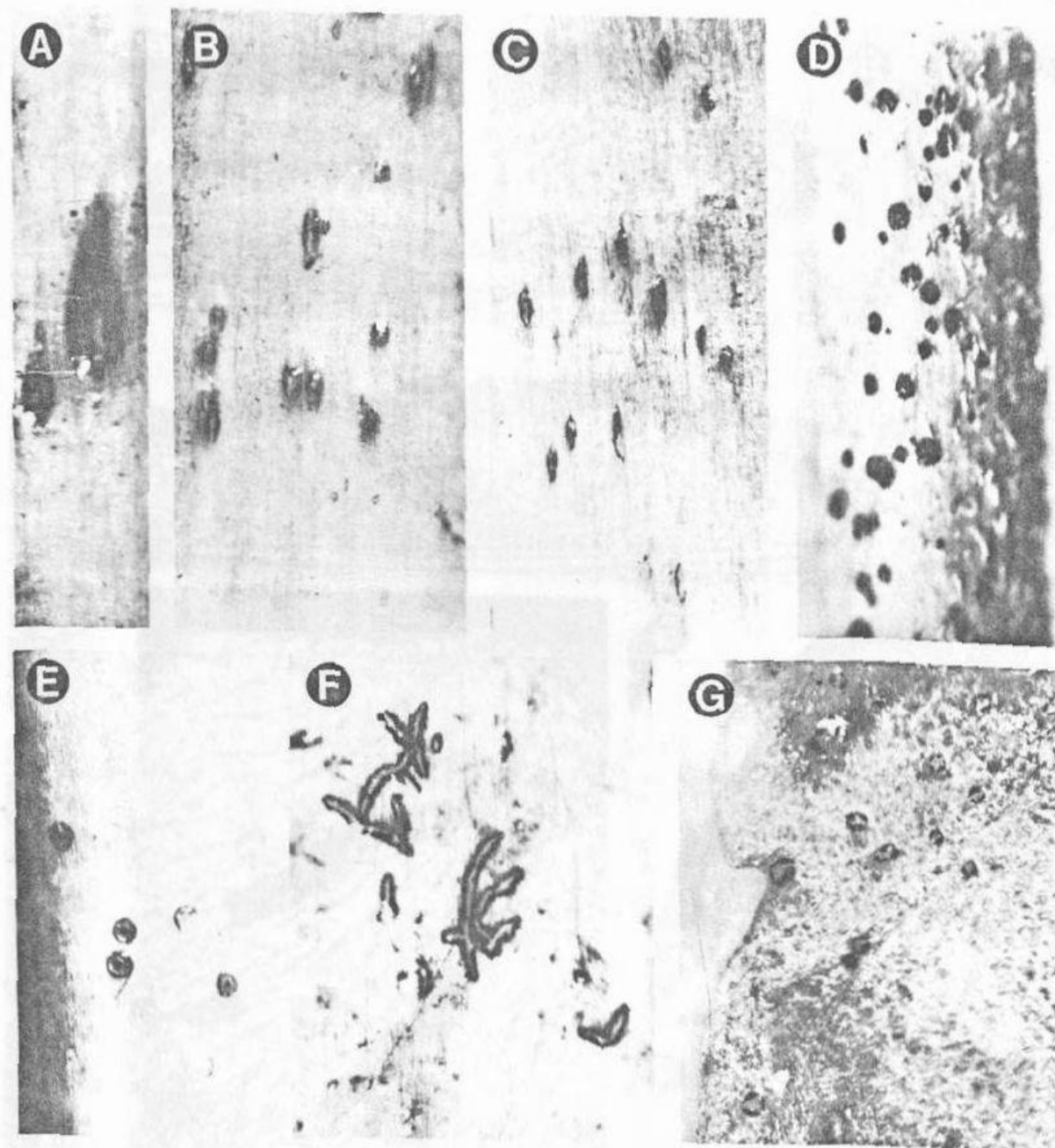


Fig. 4. Ascocarps in surface view. – A: *Mycoglaena filicina*, × 36. – B: Idem, conidial state, × 36. – C: *Hysteropeltella moravica*, × 18. – D: *Nannfeldtia phegopteridis*, × 18. – E: *Trichothyria filicum*, × 18. – F: *Morenoina* sp., × 36. – G: *Pseudopeltis filicum*, × 36.

*Exs.*: (Karst. F. fenn. 669 = *Mycosphaerella* sp.) – Rbh., Herb. Myc. II: 533, B – (Roumeg., F. Gall. 2295, immat. in UPS) – D. Sacc., Myc. ital. 845, S – Thüm., F. austr. 1051, verisimiliter, sed spec. vetusta in UPS – Vgr. Micr. 1489 sub nom. *Mycosphaerella tyrolensis*, UPS.

Fig. 1 O, 7 C.

For a full synonymy see von Arx & Müller (1954).

This fungus may occur as a true parasite, forming very distinct, dark spots in living fronds of *Polypodium vulgare*. It can be saprobic, too, in dead fronds, forming barely visible spots. It is

possible that infection always takes place in living tissues. The *perithecia* are mainly epiphyllous, rather crowded, c. 150  $\mu\text{m}$  diam., globose when wet, collapsed when dry. *Asci*  $\pm$  fusiform, c.  $50 \times 10 \mu\text{m}$ , with an apical refractive annulus, turning dark, but not blue, with iodine. *Spores* ellipsoid, hyaline, one-celled, generally with two large oil drops and one cyanophilous body (nucleus?),  $15\text{--}20 \times 5\text{--}6 \mu\text{m}$ .

This fungus was formerly regarded as a sphaerelaceous species, until von Höhnell (1918 p. 55) recognized its true affinities. von Arx & Müller (1954) referred it to *Plectosphaera*, with the comment that it was transitional to *Phyllachora*, which must be due to some misunderstanding. The generic limits within the Physosporrellaceae are very vague and it seems doubtful whether *Plectosphaera* can be upheld; it is closely related to *Glomerella*, a name which has priority. In any case our fungus closely matches *Glomerella cingulata* and *G. sesleriae*, and seems very well accommodated among them.

*Glomerella polypodii* has been little collected, despite the fact that the parasitic stage is quite conspicuous. It has also been confused with a parasitic *Mycosphaerella*. As a saprophyte it is easily overlooked, but probably not rare. We have seen 9 collections, from Germany, Austria, Bohemia, Italy and Sweden. The 5 Swedish collections are all from the province of Uppland.

#### *Monographos* Fuckel

Fuckel, Jahrb. Nass. Ver. Naturk. 29/30: 24 (1876) – Type: *M. aspidiorum* sensu Fuckel l. c. (= *M. fuckelii* nom. nov., vide infra).

This genus is one of those which have been founded on a misidentified species. Fuckel considered that the fungus which he studied was *Sphaeria aspidiorum* Libert, which it is not, as first shown by Bubák (1916 p. 324 seq.). According to some nomenclaturalists, *Monographos* should under all circumstances be typified on *Sphaeria aspidiorum*: i.e. it would then represent an obligate younger synonym for *Scirrhia*. However, the name *Monographos* has consistently been used for Fuckel's fungus and we think it wisest to follow established practice.

The taxonomic position of the genus has been a matter of dispute. Fuckel (1876) and Winter (1887 p. 914) referred it to the Dothideaceae,

because of the loculate stroma, as did Bubák (1916). Theissen & Sydow (1915 p. 189), however, demonstrated the presence of an iodine positive ring in the ascus apex (cf. below), and considered it to be a sphaeriaceous species, an opinion also held by Obrist (1959 p. 375) and by Müller & von Arx (1973 p. 120). Certainly *Monographos* is unitunicate; we will discuss its affinities more closely in a forthcoming paper.

#### *Monographos fuckelii* L. & K. Holm, nom. nov.

*Monographos aspidiorum* sensu Fuckel, Jahrb. Nass. Ver. Naturk. 29/30: 24 (1876) et auct. rec., non *Sphaeria aspidiorum* Libert, q.e. *Scirrhia aspidiorum* – Lectotype: Fuckel, F. rhen. 2665 (S).

*Matrix*: *Pteridium aquilinum*, in the petioles and (rarely?) in the lamina.

*Exs.*: Fuckel, F. rhen. 2665 (S) – Krieger, F. sax. 288 (S), 730 (S) – Petrak, Fl. Bohem. Mor. II:1:2056 (S); Myc. carp. 461 (S) – Rehm, Asc. 838 (S), 932 (S) – Syd., Myc. germ. 2143 (S) – Except for Krieger, F. sax. 730 ('*Metasphaeria epipteridea*') all issued as *Monographos aspidiorum*.

Fig. 1 M, 3 E, F, 6 E.

The general appearance of this species depends very much on the substrate. When growing in the lamina the ascocarps resemble (always?) epiphyllous spots, but in the stipe they appear as narrow streaks. In the former case they are rather variable in form and size, from circular, c. 0.1 mm diam., to elliptic and 0.5 mm long. They are about 150  $\mu\text{m}$  high, with 1–4 loculi. In the petioles the individual ascocarps are about 1 mm long, but only 0.1–0.2 mm broad. They are very flattened, being only 60–75  $\mu\text{m}$  in height, with several loculi. Several ascocarps often unite to form large crusts.

The stroma pseudoparenchyma is mainly composed of a small-celled *textura angularis* and is hyaline, except the uppermost part. The *loculi*, generally 100–125  $\mu\text{m}$  diam., often seem to be provided with a perithecial wall, which, however, consists of compressed stromal tissue, often of longitudinally elongated cells. The loculi are filled with numerous, multiseptate interascal threads. *Asci* cylindrical, very shortly stipitate, c.  $70 \times 7 \mu\text{m}$ , 8-spored, with an apically somewhat thickened wall and an annulus which is 1+ after treatment with KOH. *Spores* almost cylindrical, often slightly allantoid:  $25\text{--}28(\text{--}30) \times 3\text{--}4 \mu\text{m}$ , finally 3-septate, hyaline.

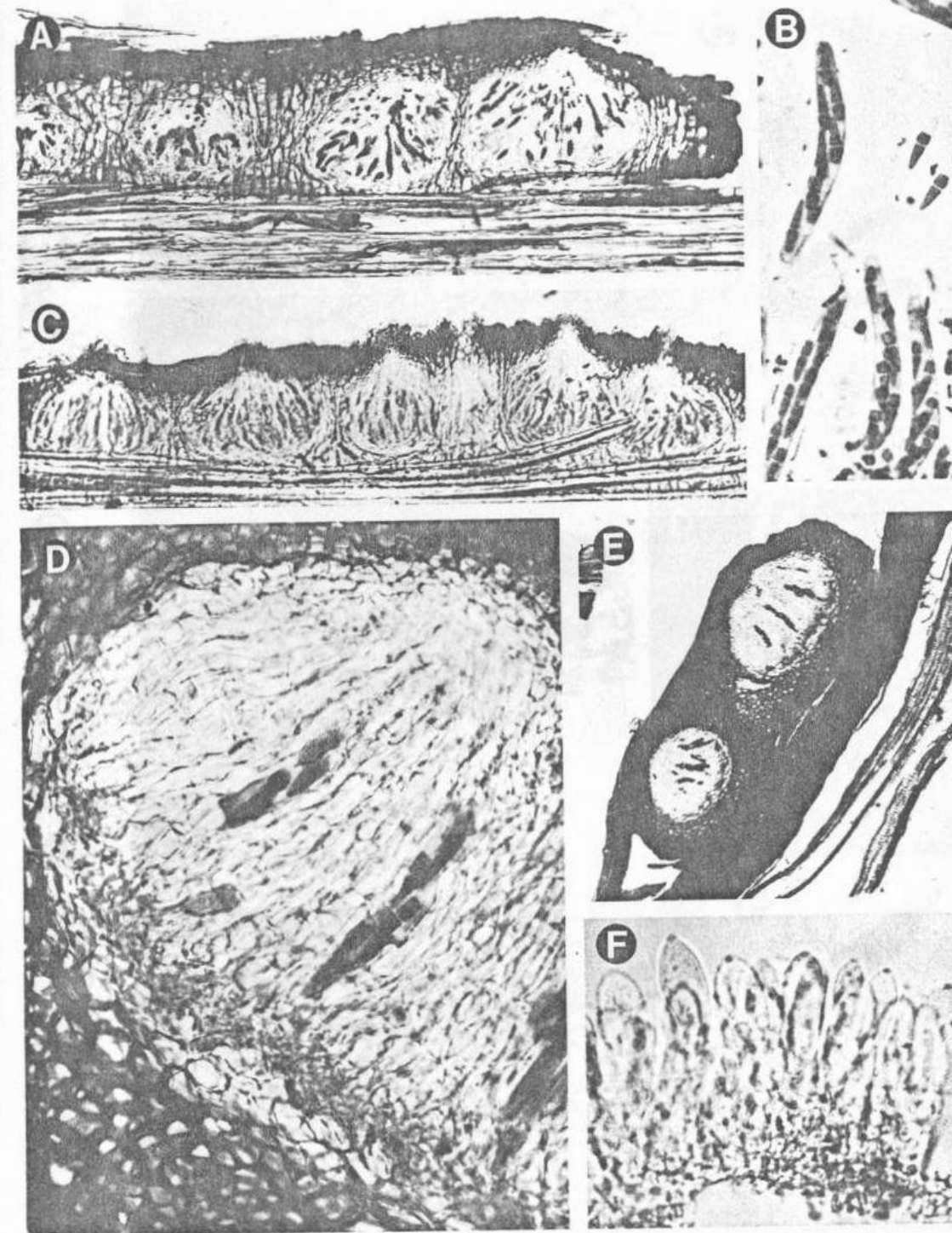


Fig. 5. A: *Scirrhia osmundae*, section of loculate stroma,  $\times 210$ . – B: *Idem*, asci and spores,  $\times 530$ . – C: *Scirrhia aspidiorum*, section of loculate stroma,  $\times 210$ . – D: '*Metameris japonica*', section of pseudoparenchymatous loculus,  $\times 530$ . – E: *Idem*, section of biloculate stroma,  $\times 80$ . – F: *Cryptomycina filicina*, asci with apical ring, 1+,  $\times 530$ .



A fairly good description was given by Winter (1887 p. 914) though his spore measurements are too low, based as they are on immature type material. There has been some disagreement about the iodine reaction of the asci: a blueing of the ascus 'pore' was first reported by Theissen & Sydow (1915 p. 190) and more recently by Obrist (1959 p. 175). On the other hand Bubák (1916 p. 327) failed to get any reaction. The dissension is apparently explained by a difference in method used: we can confirm that the ascus plug colours strongly with iodine, notably after treatment with KOH. This phenomenon was recently reviewed by Nannfeldt (1976 b), and *Monographos* can thus be added to his other examples of this particular response to iodine.

Fuckel identified the fungus with *Sphaeria aspidiorum* Libert., as did Winter. However, as first shown by Bubák (1916 p. 324 seq.), these species are very different. Bubák proposed that Fuckel's taxon should be named '*Monographos aspidiorum* Fuckel', a reasonable idea which has subsequently been accepted by several workers. Of course, that name is nomenclaturally incorrect and we think that *M. fuckelii* would form an appropriate substitute.

A conidial form is said often to be found intermixed: it was fully described by Bubák (1916 p. 297) as *Sphaerostromella pteridina* (Sacc. & Roum.) Bubák.

*M. fuckelii* is scarcely a common fungus, and we have not found it in Scandinavia. It is the common host plants which may harbour the rare fungi. Several of the cited exsiccata are duplicates, and we have seen material from only five localities.

Germany: Rheinland, Östrich (Fuckel). - Westphalen, Oechelhausen (Sydow). - Sachsen, Königstein (Krieger). - Luxemburg: Baumbusch (Feltgen). - Czechoslovakia: Moravia, Wsetin (Petrač).

#### *Monographos minor* L. & K. Holm, sp. nov.

Typus: Suecia, Uplandia, par. Dalby, in loco c. 750 m ab villa 'Jerusalem' inter septentriones et occasum solis spectante, in frondibus Athyrii filicis-feminae, 20.VI.1976, K. et L. Holm no. 907a (UPS).

Fig. 1 N, 3 G, 6 A-D.

Species a praecedente imprimis sporis valde minoribus differt.

This species occurs on several of the larger ferns, including bracken, although the sole collection from that host deviates in certain respects and is treated separately below. The 'main form' can be characterized as follows:

*Ascocarps* scattered, innate-erumpent, usually 100-150  $\mu\text{m}$  diam., collapsed when dry, applanate-globose when wet (or elongate when growing in the stipe), uniloculate. *Peridium* of a *textura angularis* of small cells (generally c. 5  $\mu\text{m}$  diam.), for the most part c. 10-15  $\mu\text{m}$  broad, but basally often thinner and round, the *porus* often thicker and heavily pigmented, often with a trace of a *clypeus*. *Asci* cylindric, sessile, about 45-50  $\times$  4-5  $\mu\text{m}$ , 8-spored, with a somewhat thickened apex, containing a ring which is 1+ after treatment with KOH. *Spores* distichous, with obtuse ends, elliptic-fusiform, 10-12 (-15)  $\times$  2.5-3.5  $\mu\text{m}$ , hyaline, uniseptate, guttulate when immature. *Interascal filaments* pluriseptate.

This fungus is generally recognizable even macroscopically, by its collapsed ascocarps which look like a 'Naevia'. They occur on both sides of the lamina, as well as on the rachis and on the petiole - on the latter substrate the ascocarps become somewhat elongate. As for *Monographos fuckelii*, an iodine reaction is obtained only after treatment with a strong hydroxide solution.

An imperfect form, macroscopically indistinguishable, is often found intermixed and is in all probability connected. It is scolecosporous and apparently very similar to *Sphaerostromella pteridina*, the imperfect form of *M. fuckelii*.

As mentioned above, a somewhat deviant form has been found in the lamina of bracken. It may be rare on this host, since we have only found it once, intermixed in Rehm. Asc. 270 ('*Hypoderma aquilinum*', i.e. *Leptopeltis pteridis*, cf. Holm & Holm 1977 p. 220), although it was rather abundant, at least in the UPS copy. In this material the ascocarps are considerably larger than those of the 'main form', attaining a diameter of at least 300  $\mu\text{m}$  and possessing up to 3 loculi. The *peridium* is also stronger. As a matter of fact, in general appearance these ascocarps are strongly reminiscent of the laminicolous ascocarps of *M. fuckelii*. *Asci* and *spores*, however, fully agree with those of normal *M. minor*, so we think that the fungus

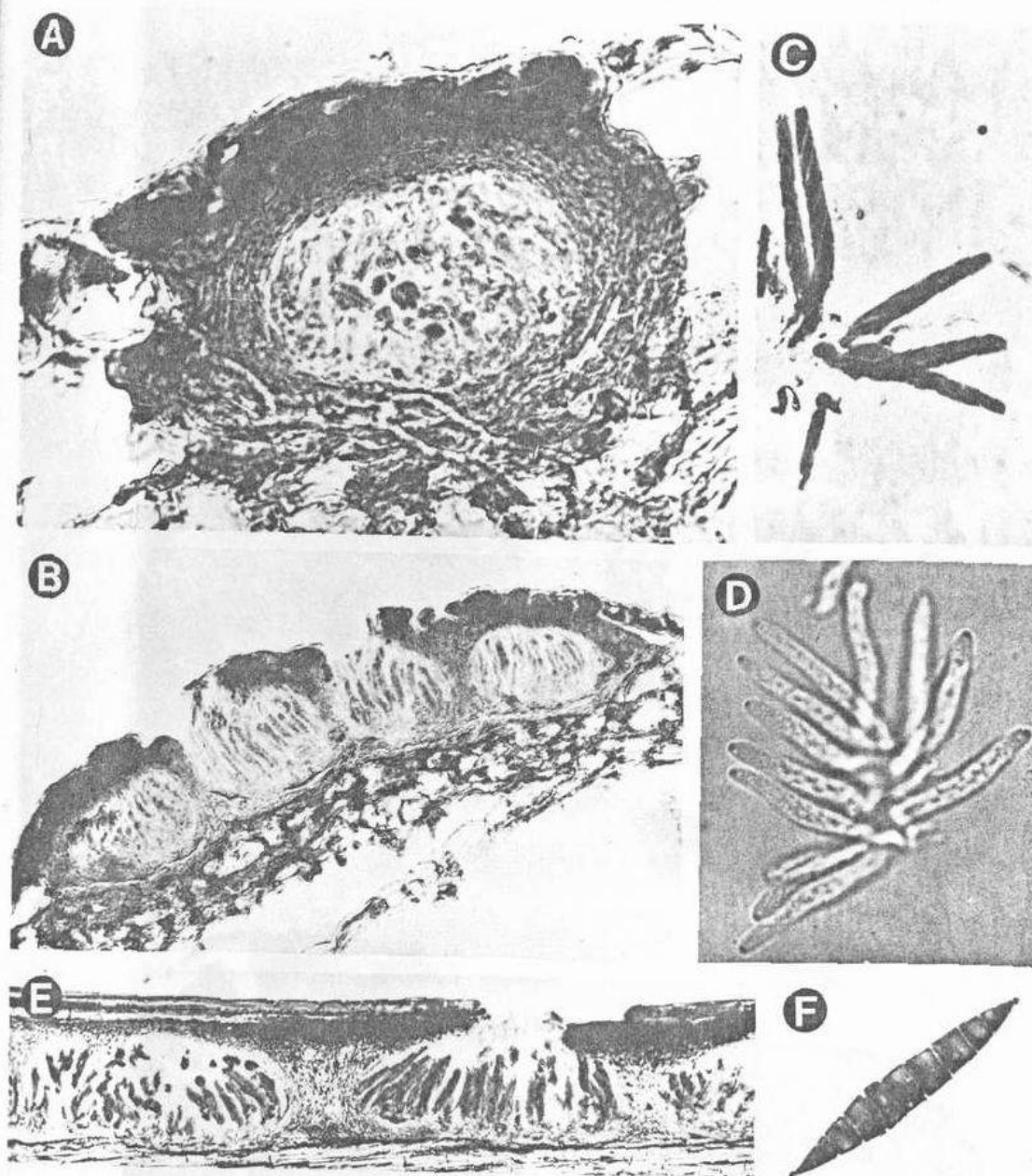


Fig. 6. A: *Monographos minor*, section of uniloculate ascocarp,  $\times$  530. - B: Idem, section of pluriloculate ascocarp,  $\times$  210. - C: Idem, asci in lactic blue,  $\times$  530. - D: Idem, asci in iodine,  $\times$  530. - E: *Monographos fuckelii*, section of foculate stroma,  $\times$  210. - F: *Dangeardiella macrospora*, spore in lactic blue, with terminal swellings,  $\times$  530.

collection on *Pteridium* should be referred to this species.

*Monographos minor* is scarcely a common species. We have found it in 5 collections only,

but it can be quite abundant, as in 855e and 907a. The 'main form' can easily be mistaken for a *Mycosphaerella* at first sight. Besides the type, we have also seen the following material,

Sweden: Uppland. Dalby, c. 200 m NW of 'Jerusalem', 10.VI.1976, *Athyrium filix-femina*, 855c. - Uppsala-Näs, c. 500 m N of S. Focksta, 7.V.1975, *A. filix-femina*, 502c. - Gästrikland. Hille, c. 500 m SE of Brännsågen, *Lastrea phegopteris*, 21.V.1975, 560c.

Norway: Møre og Romsdal, c. 4 km NE of Gjöra, near Driva, *Dryopteris filix-mas*, 1.VII.1976, 666b.

Germany: Bavaria. Bayreuth, *Pteridium aquilinum*, IV.1874, leg. Thümen (intermixed in Rehm, Asc. 270).

*Mycoglaena filicina* L. & K. Holm, sp. nov.

Typus: Suecia, Uplandia, par. Dalby, pr. "Jerusalem", in stipitibus emortuis Athyrii filicis-feminae, 31.V.1976, K. & L. Holm 848a (UPS).

Fig. 4 A, B, 8 B.

*Ascocarpia* solitaria vel bina aggregata, 150–200  $\mu\text{m}$  diam., 50  $\mu\text{m}$  alta, superne clypeo virido-atro tenuo, 0.3–0.5 mm longo, conjuncta. *Peridium* c. 10  $\mu\text{m}$  latum, e textura pro maxima parte hyalina, apice viridula, cellulis minutissimis (maxime c. 5  $\mu\text{m}$ ). *Asci* subcylindracei, ad 75  $\times$  10  $\mu\text{m}$ , unitunicati?, apice leniter incrassati, annulo minuto ope iodi fuscato instructi, octospori. *Sporae* irregulariter biseriatae, ellipsoideae vel paullo cuneatae, 3-septatae, cellula secunda vulgo majore, hyalinae, 12–17  $\times$  4–5  $\mu\text{m}$ . *Filamenta interthecialia* absentia?

This fungus is apparently undescribed, despite being common and characteristic as well. It is even recognizable macroscopically, by its clypeus, which forms a more or less greenish, elongate spot; opening by a pore or a longitudinal slit.

When wet it has a particularly conspicuous colour which reminds one of *Mycoglaena subcaerulescens* (Nyl.) Rehm, and *Winteria lichenooides* (Rehm) Sacc., both of which occur on coniferous wood. All these fungi are certainly closely allied. The spore type recalls "*Odontotrema inclusum*" (Karst.) Karst., a species which ought perhaps to be referred to *Mycoglaena*. The more well-known name *Winteria* Rehm ex Sacc. must unfortunately be abandoned as illegitimate, cf. Holm 1975 p. 486.

An imperfect form is often found intermixed and is without doubt connected. It is similar in appearance (Fig. 4 B), but instead of asci conidia are formed; they are rodlike, 2-celled, hyaline, 10–12  $\times$  1.5–2  $\mu\text{m}$ , produced from a basal layer of pyriform conidiogenous cells. Apart from the clypeus, this form could be ascribed to *Diplodia*.

*Mycoglaena filicina* is probably widespread, but so far we have only collected it in Sweden, Uppland, where it seems to be common at the

base of two-years old petioles of some larger ferns: we have found it on *Athyrium filix-femina* and *Dryopteris filix-mas*.

*Pyrenomyces bitunicati*

*Botryosphaeria* sp.

Fig. 1 K.

*Ascocarps* rather crowded, immersed-erumpent, c. 100  $\mu\text{m}$  diam., collapsed, almost without papillae. *Asci* subsaccate-cylindric, bitunicate, c. 50  $\times$  10  $\mu\text{m}$ , very shortly pedicellate, 8-spored. *Spores* elliptico-fusiform, terminally obtuse, continuous, hyaline, 13–18  $\times$  5–6  $\mu\text{m}$ . *Interthecial threads* absent.

This fungus is without doubt a member of *Botryosphaeria* s.lat. (including *Guignardia* sensu von Arx & Müller). It is possibly an undescribed pteridicolous species, but it may also be a question of an incidental occurrence on bracken of a species which normally inhabits some unrelated host. We leave this problem to a future monographer of the genus.

We have encountered this fungus once only, but the collection is fairly rich: Sweden, Uppland, Dalby, c. 500 m SSW of 'Jerusalem', in dead fronds of *Pteridium aquilinum*, 8.V.1976, 804 g.

*Dangeardiella* Sacc. & P. Sydow

Sacc. & P. Sydow, Syll. Fung. 14: 683 (1899) - Type: *D. macrospora*.

The genus was erected with the short diagnosis: "A *Monographo* differt imprimis sporidiis elongatis, pluri (6–8-)cellularibus". However, it is certainly not related to *Monographos*, in whatever sense this genus is conceived, but probably lies closest to certain Lophiostomataceae, as already pointed out by Rostrup (1904). *Dangeardiella* so far comprises two species, both of which were thoroughly dealt with by Obrist (1959); we refer to his paper in the main, merely adding some complementary data.

*Dangeardiella fusiforma* Obrist

Obrist, Phytopath. Zeitschrift 35: 381 (1959) - Type: Switzerland, Graubünden, Val Tuors, "abgestorbene Blattstiele von *Dryopteris filix-mas*", E. Müller (ZT).

Fig. 1 C, B, 2 D, E.

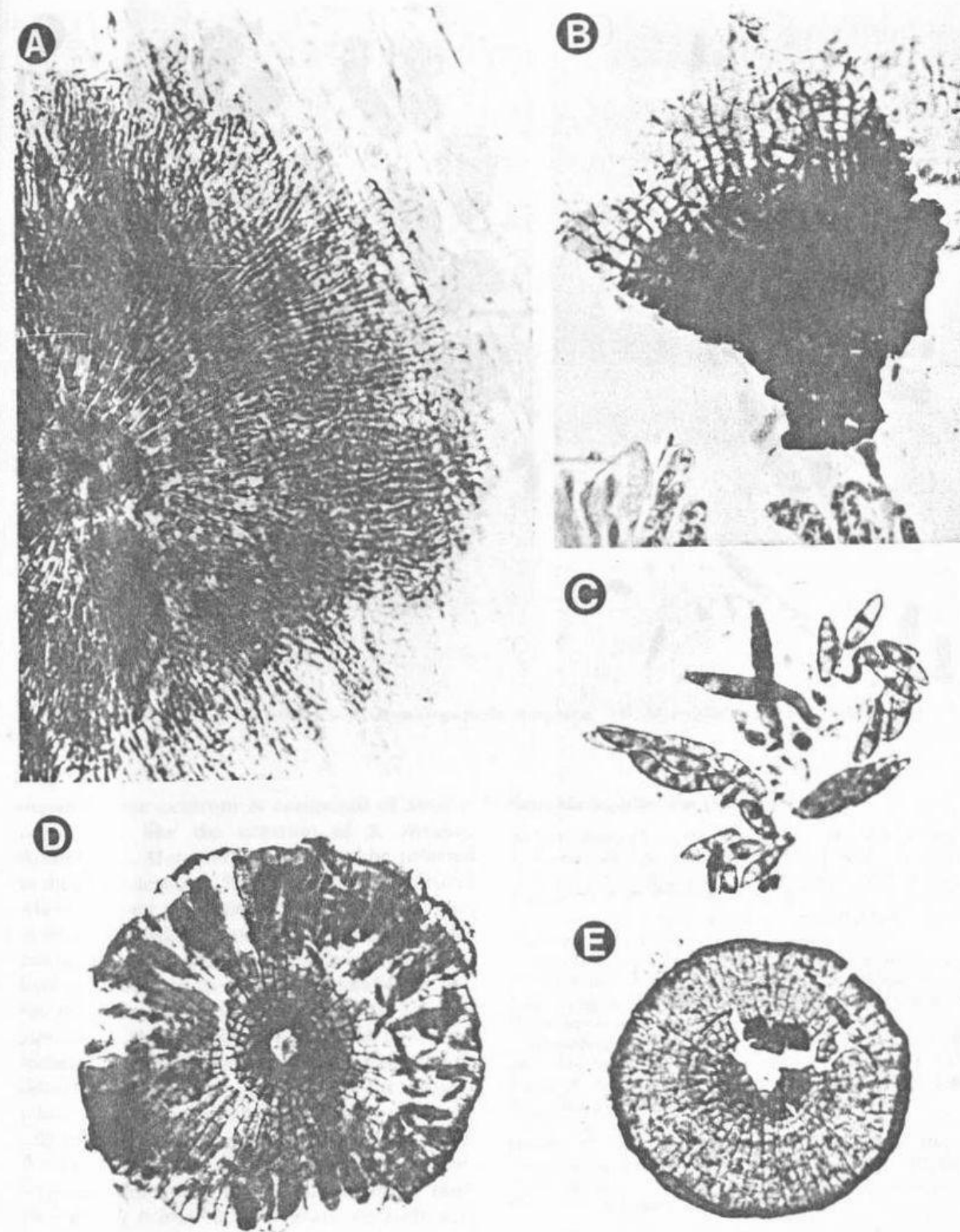


Fig. 7. A: *Nannfeldtia phegopteridis*, ascocarp in surface view. - B: *Pseudopeltis filicum*, part of shield, and asci. - C: *Glomerella polypodii*, asci and spores, in lactic blue. - D: *Trichothyria filicum*, mature ascocarp in surface view, with asci in lactic blue. - E: Idem, immature ascocarp. - All  $\times$  530.



*Ascocarps* immersed-erumpent, simple or compound. In the former case they consist of a single pseudothecium, c. 250  $\mu\text{m}$  diam., with a distinct, somewhat flattened papilla. The compound ascocarps attain a size of 1 mm, and contain up to at least 3 'loculi' with very reduced partition walls. These ascocarps may fuse to form still larger fruit bodies. The simple ascocarps occur in the nerves of the lamina, the larger ones in the petioles.

The spores display a wide variation, and the species is probably heterogeneous. Obrist (1959) reported the spores to be 30–40  $\times$  8–11  $\mu\text{m}$ , 6–8(–10)-celled. We found them to be 25–50  $\times$  6–10  $\mu\text{m}$ , 5–12-celled. Most of our material is rather uniform, with short spores, about 25–30  $\times$  7.5–9  $\mu\text{m}$ , 6–8-celled, elliptico-fusiform, asci almost cylindrical, 80–100  $\times$  12–15  $\mu\text{m}$ . Three collections from Norway on *Dryopteris filix-mas*, however, are remarkably different (nos. 639b, 642 and 664b). The spores (Fig. 1 B) are fusiform, 42–50  $\times$  9–10  $\mu\text{m}$ , with 10–12 cells, the asci rather saccate, c. 110–135  $\times$  25  $\mu\text{m}$ . This form recalls *D. macrospora*, but the spores are obtuse and lack the peculiar terminal "balls". It seems rather intermediate. It is noteworthy that Obrist's measurements fall between those of our two forms, and that they refer to material found on *Dryopteris filix-mas*. *Dangeardiella fusiforma* is so far known only from the type material. We have 10 collections, from 4 different hosts:

Sweden: Skåne. Skärålid, 13.VI.1974, 216a. *Dryopteris dilatata*. – Uppland. Ekeby, E of lake Vällan, 9.V.1975, 517b. *Athyrium filix-femina* and 518b. *Dryopteris filix-mas*. – Dalarna. Sundborn, Grops, 22.VI.1974, 275b. *Athyrium filix-femina*. – Grops, 18.V.1975, 555a. *Dryopteris dilatata*. – Grops, 23.VII.1975, 707a. *D. dilatata*. – Logårdsdammen, 27.VI.1976, 883b. *D. spinulosa*.

Norway: Sør-Trøndelag. Oppdal, pr. Gjevilsvasshytta, c. 800 m, 29.VI.1975, 639b & 642. *Dryopteris filix-mas*. – Möre og Romsdal. Gjöra, 1.VII.1975, 664b. *D. filix-mas*.

***Dangeardiella macrospora* (Schröt.) Sacc. & P. Sydow**

Sacc. & P. Sydow, Syll. Fung. 14: 683 (1899) – *Monographus macrosporus* Schröter, Pilze Schlesiens 2: 477 (1897) – Type: Germany, Silesia, Hirschberg, *Athyrium alpestre*.

Fig. 1 A, 3 C, D, 6 F.

For further synonyms see Obrist 1959 p. 379.

The ascocarps of this species are generally larger and more conspicuous than those of *D. fusiforma*. Simple ascocarps are about 450  $\mu\text{m}$  diam., with a strong papilla and quite similar to those of a *Lophiostoma*. They not only occur in the leaf veins but also on the stipes. The compound fruit-bodies have a long 'crest'. The spores are very characteristic: large, fusiform, 65–75  $\times$  10–11  $\mu\text{m}$ , mostly 10-celled, constricted below the 5th cell, which is inflated. (Obrist's figures represent inverted spores). The terminal, ball-shaped dilatations are a very peculiar feature, first noticed by Obrist, who states that they finally become delimited by a septum forming a separate "Kugelzelle". The asci are almost cylindrical, about 225  $\times$  25  $\mu\text{m}$  diam.

*D. macrospora* definitely prefers *Athyrium alpestre* (= *distentifolium*) and has been found on that host in Scandinavia, the Alps and the Riesengebirge. It seems to be rather common in Scandinavia. Rostrup (1904 p. 12) recorded it from Norway on *Dryopteris spinulosa*, and we have found it on *Athyrium filix-femina* in a lowland locality in Norway: Möre og Romsdal, c. 4 km NE of Gjöra, about 200 m.

***Scirrhia* Nitschke ex Fuckel**

Fuckel, Symb. Mycol. 220 (1870) – Lectotype (selected by Clements & Shear 1931 p. 294): *S. rimosa* (Alb. & Schwein. ex Fr.) Nitschke ex Fuckel.

*Metameris* Theiss. & Sydow, Ann. Mycol. 13: 342 (1915) – Type: *M. japonica* (Syd.) Syd.

*Scirrhodothis* Theiss. & Sydow, Ann. Mycol. 13: 415 – Lectotype (selected by Clements & Shear 1931 p. 294): *S. confluens* (Starb.) Theiss. & Sydow.

*Scirrhophragma* Theiss. & Sydow, Ann. Mycol. 13: 423 – Type: *S. regalis* Theiss. & Sydow.

The above synonymy is to some extent controversial. No doubt *Metameris*, *Scirrhodothis* and *Scirrhophragma* are closely allied, and were united, rightly we think, by von Arx & Müller (1975 p. 80) who used the name *Metameris* for the combined taxon. These authors, however, referred it to the Pleosporaceae, as also did Barr (1972 p. 564), thus separating it far apart from the dothideaceous *Scirrhia*. We cannot follow this classification, because *Metameris*, too, has an ascocarp centrum of *Dothidea* type. This is particularly apparent in *M. japonica*, where the centrum consists of large, broad cells, about 12–15  $\times$  10  $\mu\text{m}$  (cfr. Fig. 5 D). These are not pseudoparaphyses. In *S. aspidiorum* and *S.*

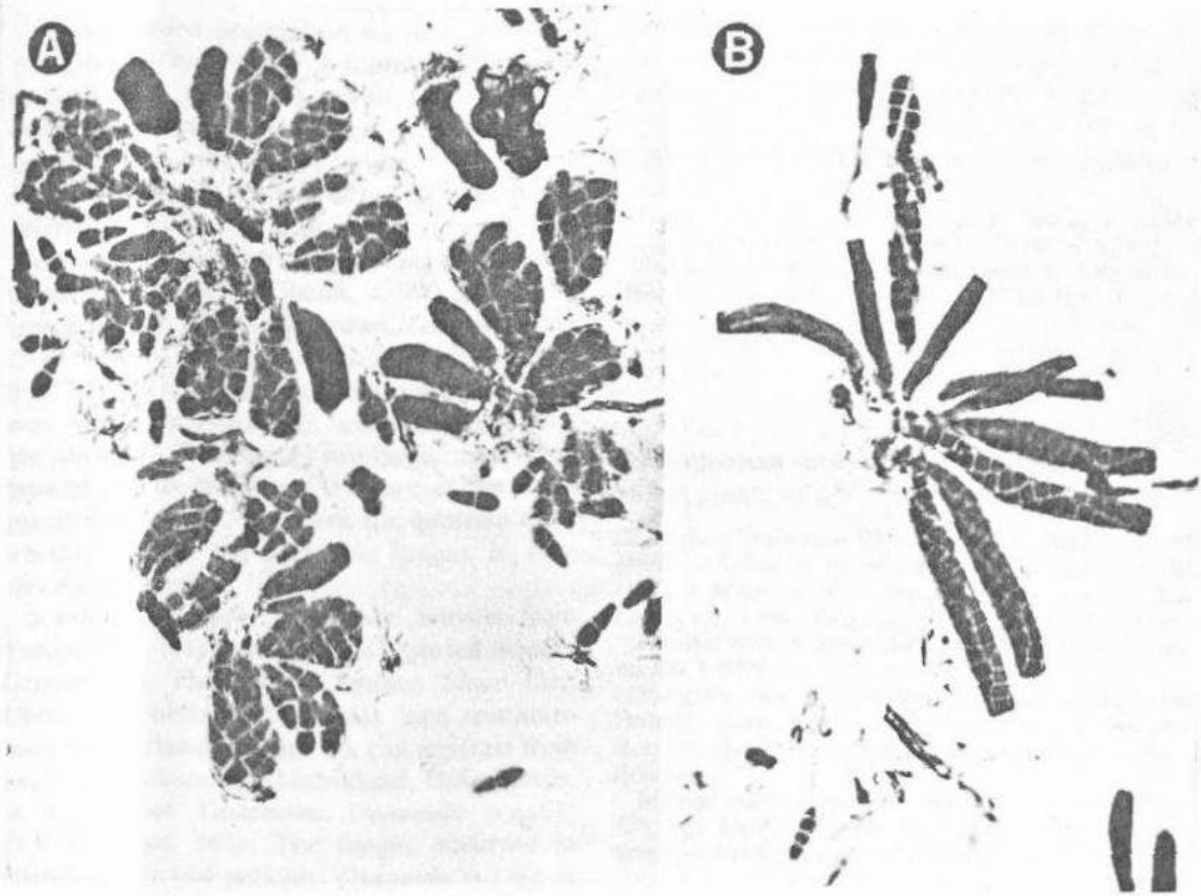


Fig. 8. Asci and spores in lactic blue. – A: *Hysteropeltella moravica*. – B: *Mycoglaena filicina*. – All  $\times$  530.

*osmundae* the centrum is composed of smaller cells, more like the centrum of *S. rimosa*. Accordingly, *Metameris* s.lat. must be referred to the Dothideaceae. It is perhaps questionable whether or not it should be included in *Scirrhia* as done by Müller & von Arx (1962 p. 379). We cannot see any convincing reason why not. Certain differences do exist in stromatic texture, but they are evidently immaterial. In *Scirrhia aspidiorum* the stroma is composed of almost rectangular cells (seen in section), disposed in distinct vertical rows, whereas in the closely related "*Metameris japonica*" the stromatic cells are isodiametric and not serially arranged. We would also cite *S. castagnei* as a further argument for this presumed kinship: morphologically it matches *S. rimosa* very closely, but is biologically more similar to *Metameris*, since it also grows on a pteridophyte viz. *Equisetum*.

***Scirrhia aspidiorum* (Lib.) Bubák**

Bubák, Ber. Deutsch. Bot. Ges. 34: 328 (1916) – *Sphaeria Aspidiorum* Libert, Pl. Crypt. Ard. 342 (1837) – *Scirrhodothis Aspidiorum* von Höhnel, Fragm. Mykol. 1185 (1919) – *Monographus aspidiorum* sensu auct. nonnull., non sensu Fuckel – Type: Belgium, "in stipitibus Aspidiorum, Vere."

*Sphaeria pteridicola* Berk. & Curtis, Grevillea 4: 145 (1876) ('*pteridicoli*') – *Didymella pteridicola* Sacc., Syll. Fung. 1: 561 (1882) – Type: USA, South Carolina, *Pteridium aquilinum*, Curtis (K! UPS!).

*Monographus microsporus* Niessl in Krieger, F. sax. 240 (1887) – *Scirrhia microspora* Sacc., Syll. Fung. 9: 1040 (1891) – Type: Germany, Königstein, *Athyrium filix-femina*, Krieger (S!).

*Scirrhia confluens* Starbäck, Bih. K. Sv. Vet.-Akad. Handl. 15. 3(2): 18 (1889) – *Scirrhodothis confluens* Theissen & Sydow, Ann. Mycol. 13: 415 (1915) – Type: Sweden, Öland, Ottenbylund, *Athyrium filix-femina*, 17.VI.1888, Starbäck (UPS!).

Exs.: Krieger, F. sax. 240 ('*Monographus microsporus*'), 249 ('*M. micr.*') 775 ('*M. micr.*') (non 288, q.e. *M. fuckelii*) – Lib., Pl. Crypt. Ar. 342 (S) – Petr., Fl. Bohem. Mor. II:1:2196 (S) (non 2056, q.e. *M. fuckelii*, nec non Myc. carp. 461 idem) – Rbh., F. eur.



3966 ('*M. micr.*', S) - Rehm, Asc. 931, 1064 ('*M. micr.*', S) (non 932 q.e. *M. fuckelii*) - Syd., Myc. march. 2066 (S, UPS) (2183? vetustus in S, UPS), non Syd., Myc. germ. 2143, q.e. *M. fuckelii*).

Fig. 1 E, F, 3 A, B, 5 C.

For a detailed description of this well-known species we refer to Obrist (1959 p. 373), who, however, was apparently not fully aware of the great variation which exists in its stroma morphology, which is quite noteworthy. When well-developed, the stromata may attain 5 mm in length and 1 mm in breadth, being composed of vertical series of  $\pm$  cubic cells and containing numerous separate loculi. This type of stroma may perhaps be considered the basic one, from which the others can be derived along two lines of evolution: (1) the fusion of adjacent loculi through reduction of the intermediate wall; (2) the dismemberment of the stroma into smaller discrete bodies with fewer loculi, ultimately leading to the formation of uniloculate dothithecia. This variability was rightly emphasized by Petrak (1927 p. 365; 1953 p. 306) who pointed out the occurrence of a *Didymella*-like form in the lamina. We have found this form in the larger leaf-veins of *Pteridium aquilinum*. Petrak was inclined to consider *Scirrhia aspidiorum* as "eine, gelegentlich auch in einer stromatischen Form auftretenden *Didymella*" (Petrak 1953 l.c.). This statement seems rather exaggerated, however. The true *Didymellae* have interthelial threads, generally considered to be pseudoparaphyses. Such are not present in *Scirrhia* - also the solitary dothithecia have a pseudoparenchymatous centrum. *Didymella pteridicola* is conspecific; the type material is the normal stipicolous form (for other synonyms, see Bubák 1916 and Petrak 1953.)

*Scirrhia aspidiorum* seems to be a fairly homogeneous taxon, in spite of occurring on a variety of hosts. The usual form has small obtuse spores,  $10-13 \times 3 \mu\text{m}$ . However, we have three collections from *Pteridium aquilinum* (Fig. 1 F), which possess distinctly larger spores ( $18-23 \times 4-5 \mu\text{m}$ ) with somewhat more acute ends (two collections from Sweden, Uppland, 195c & 804d, and one from Norway, Sunndalsöra, 678a). The common small-spored form is also found on *Pteridium*, as exemplified by e.g. Krieger, F. sax. 289, and Petrak, Fl. Bohem. Mor. II:1:2196.

A subspecific taxon has been described, viz.

var. *struthiopteris* Krieger ex Rehm, Hedwigia 31: 303 (1892); type: Saxony, *Matteuccia struthiopteris* = Rehm, Asc. 1064 (S!) According to Rehm, the spores are "grösser und breiter als bei der Stammform". This seems very doubtful, but nevertheless *Matteuccia* may possibly have a form of its own: the imperfect state *Sphaerothyrium filicinum* Bubák does seem to have a marked preference for this host; e.g. we have 4 collections from *Matteuccia*, but only 1 (uncertain) from another host (*Athyrium filix-femina*).

*Scirrhia aspidiorum* is common in Sweden, at least in the lowlands, in the leaves of the larger ferns, mainly on the petioles. It is perhaps particularly common on *Athyrium filix-femina*, but we have also found it on *Dryopteris dilatata*, *D. spinulosa*, *D. filix-mas*, *Lastrea dryopteris* (new host?), *L. thelypteris*, *Matteuccia struthiopteris* and *Pteridium aquilinum*.

*Scirrhia osmundae* (Peck & Clinton) L. & K. Holm, comb. nov.

*Dothidea Osmundae* Peck & Clinton, Ann. Rep. New York State Mus. 30: 64 (1878) - *Scirrhophragma Osmundae* Obrist 1959 p. 377 - *Metameris Osmundae* von Arx & Müller 1975 p. 80 - Type: USA, N.Y., Buffalo, *Osmunda* sp., leg. Clinton (n.v.).

*Scirrhophragma regalis* Theissen & Sydow, Ann. Mycol. 13: 423 (1915) - Type: Germany, Sperenberg, *Osmunda regalis*, V. 1912, H. Sydow (S!).

?*Monographos japonicus* Sydow, Ann. Mycol. 12: 408 (1910) - *Metameris japonica* Theissen & Sydow, Ann. Mycol. 13: 342 (1915) - Type: Japan, Mino, Kawauye-mura, *Osmunda regalis* var. *japonica*, 10. V. 1912, K. Hara (S!).

Fig. 1 G (H), 2 C, 5 A, B (D, E).

This species is easily recognized by its characteristic spores. As a matter of fact, the spore type seems to be unique. Its true nature has been misunderstood, however. In our experience the spores are always 2-celled, though appearing to be 3-celled on account of the contraction of the protoplast in the upper cell to leave an air-filled apical space. This peculiar spore type was observed by Theissen & Sydow, but they interpreted the spores as being 3-celled, with the comment that the presumed uppermost cell "nimmt fast keinen Farbstoff an" (Theissen & Sydow 1915 p. 343). This is obviously a quite constant phenomenon in mature spores - immature ones are plasma-filled in the normal manner.

For a detailed description we refer to Obrist 1959 (though his Fig. 17 a represents inverted spores!). The synonymy given above is also based on his paper. He suggested *Metameris japonica* as a probable synonym, and it is no doubt very closely related, although some minor differences exist. In European material, the stromata are larger, up to 2 mm long and 0.5 mm broad, with numerous loculi, c.  $100 \mu\text{m}$  diam., arranged in up to 3 parallel rows. The spores are  $15-18 \times 4 \mu\text{m}$ . The type of *Metameris japonica* (Fig. 1 H, 5 D, E) has smaller stromata, 0.3-0.6 mm, with only 1-3 loculi, which are larger, c.  $150 \mu\text{m}$  diam. The spores are larger, and often broader, up to  $26 \times 6 \mu\text{m}$ , but are of the same characteristic type. We leave the question open whether or not the Japanese fungus is conspecific with ours.

*Scirrhia osmundae* was not known from Europe until 1915, when it was reported from N Germany by Theissen & Sydow. Since then Obrist has published two finds from southernmost Switzerland, Tessin. We can report it from one Swedish locality: Gästrikland, Hille parish, at the rivulet Testeboån, *Osmunda regalis*, 21.V.1975, no. 562a. The fungus occurred in abundance on old petioles. *Osmunda* is rare in Sweden and the above-mentioned locality, in fact a northern outpost, is the only one which we have visited. The fungus is probably more common than the few finds so far would suggest.

*Morenoina* sp.

Fig. 11, 4 F.

A few times we have encountered a fungus similar to *Morenoina epilobii* (Lib.) von Arx, and which is possibly conspecific; however, since we have not yet seen any well developed material of the latter species, the question is still open.

The ascocarps are quite superficial, generally rather densely scattered, lirelliform, often ramose, c.  $50 \mu\text{m}$  broad and usually 0.1-0.5 mm long. The shield consists of one layer of radiately arranged dark-brown cells, c.  $5 \times 3 \mu\text{m}$ , rectangular in surface view, at the margins grading into a sparse, brown mycelium. Basal layer 0, hypostroma 0, interthelial threads 0. Asci saccate-subglobose, apparently bitunicate,  $18-20 \times 12-14 \mu\text{m}$ , 8-spored. Spores irregularly dis-

posed, about ellipsoid, with one median septum, the upper cell somewhat broader, elongate hyaline, lastly faintly brownish, when young with conspicuous oil droplets,  $8-10 \times 3-4 \mu\text{m}$ .

At the base of dead petioles of various ferns.

Sweden: Uppland, Uppsala-Näs, c. 700 m W of the farm Högby, *Dryopteris filix-mas*, 27.IV.1975, 479b. - Härjedalen, Tännäs, Mt Hamrafället, SW slope, uppermost part of regio subalpina, 27.VI.1975, *Lastrea dryopteris*, 605c, and *Polystichum lonchitis*, 609c.

Norway: Hedmark, pr. Trysil, 3.VII.1975, *Athyrium filix-femina*, 699b.

*Schizothyrium speireum* (Fr. ex Fr.) L. & K. Holm, comb. nov.

*Sclerotium? speireum* Fr. ex Fr., Syst. Mycol. 2: 261 (1822) - *Sphaeria speirea* Fr., Obs. Mycol. 1: 185 (1815) - *Myiocopraloa speirea* Ciferri, Atti Ist. Bot. Lab. Critt. Univ. Pavia ser. 5, 15: 19 (1957) - Type: "In foliis vivis Aegopodii Podagrariae" (Scler. succ. no 206, UPS!).

*Schizothyrium perexiguum* (Rob. ex Desm.) von Höhnel, sensu auct., non *Phacidium perexiguum* Rob. ex Desm., q.e. *Naevia minutissima* (Auersw.) Rehm.

*Microthyriella Osmundae* Booth, Kew Bull. 1957 p. 424 fide Müller & von Arx 1962 p. 200 - Type: England, Norfolk, *Osmunda regalis*, leg. Dennis.

*Schizothyrium speireum* is one of the common "fly-speck fungi" and is considered to be highly polyphagous, and even pteridicolous, since Müller & von Arx (1962) included *Microthyriella osmundae* in its synonymy. Possibly, however, *Osmunda* has a strain of its own - we have found the fungus in abundance on this host, in the sole *Osmunda* locality which we visited. Otherwise *Schizothyrium* seems rarely to occur on ferns, viz. we found it only once, on the Male Fern, see below. For a description, see Booth 1958 (as '*Microthyriella Osmundae*') and Müller & von Arx 1962 (as '*Schizothyrium perexiguum*').

The nomenclature presents some problems. The name *Schizothyrium perexiguum* is unfortunately untenable, since it is due to a mistake made by von Höhnel (1917 pp. 297, 327). It was based on *Phacidium perexiguum* Rob. ex Desmazières (1849 p. 362). The description is suggestive of *Naevia minutissima* Rehm, a surmise which is confirmed by the authentic material, dead leaves of *Quercus rubra*, distributed in Desmazières, Plantes Crypt. France, éd. 3, no. 793. von Höhnel erroneously identified *Phacidium perexiguum* with *Microsticta vagans*



Desm., a species also present on the same oak leaf material and which is conspecific with our fungus. In consequence, we have to find another epithet for it. We consider that the best solution is to adopt the old name *Sphaeria speirea* Fr., as was done by Ciferri et al. (1957). Authentic material is present in Scler. succ. no. 206; although sterile, at least in the UPS copy, it is otherwise typical.

The following pteridicolous specimens have been seen.

Sweden: Uppland. Västeråker, moist forest with *Daphne*, on dead petioles of *Dryopteris filix-mas*, 20.VI.1976, 889a. - Gästrikland. Hille, Brännsågen, at the rivulet Testeboån, on dead petioles of *Osmunda regalis*, 21.V.1975, 562b.

The epithet *perexigua* should be transferred to the discomycete, called *Naevia minutissima* (Awd) Rehm: As *Naevia* is illegitimate when used in this sense, the name was recently replaced by *Naevula* Hein (1976 p. 83); the correct name for the fungus thus becomes *Naevula perexigua* (Rob. ex Desm.) L. & K. Holm, comb. nov. = *Phacidium perexiguum* Roberge ex Desmazières, Ann. Sci. Nat. Bot. ser. 3, 11: 362 (1849).

#### *Trichothyria filicum* L. & K. Holm, sp. nov.

Typus: Suecia, Uplandia, par. Dalby, pr. "Jerusalem", 7.X.1976. *Pteridium aquilinum*, in frondibus anni praeteriti, K. & L. Holm, no. 931a (UPS).

Fig. 1 P. 7 D, E.

Species *Trichothyriae* pinophyllae affinis, sed ab ea differt imprimis sporis eguttulatis, cellula superiori basi inflata.

*Ascocarps* scattered,  $\leq 100 \mu\text{m}$  diam., flattened with a distinct pore. *Asci* rather numerous, c. 25, elongate-pyriform, sessile, 8-spored. *Spores* fusiform, obtuse, 2-celled, distinctly inflated above the median septum,  $8-12 \times 2.5-3 \mu\text{m}$ , hyaline, eguttulate. No *interthecial threads* present, and apparently no superficial mycelium.

On dead leaves of various ferns, growing on the petiole as well as on the lamina, particularly on the upper surface.

This minute fungus has evidently not been reported before; nevertheless it seems to be quite common on several ferns. We have found it on *Athyrium filix-femina*, *Dryopteris dilatata*, *D. filix-mas*, *Matteuccia struthiopteris*, *Polystichum lonchitis* and *Pteridium aquilinum*. It is

common in the Uppsala area and certainly has a wide distribution: we have collected it in the subalpine region of Mt Hamrafjället in Härjedalen, Sweden, and have also found it in Norway (Oppdal) and Iceland (Ólafsfjörðarmúli).

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