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CONTRIBUTIONS TOWARDS A MONOGRAPH OF PHOMA (COELOMYCETES) – III

2. Misapplications of the type species name and the generic synonyms of section Plenodomus (Excluded species)

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Various old records of *Phoma lingam* (teleomorph *Leptosphaeria maculans*) on non-cruciferous plants proved to be based on misidentifications. In the past the fungus has also often been confused with other fungi occurring on crucifers. Forty-five species formerly classified under the generic synonyms *Plenodomus, Diploplenodomus, Leptophoma* and *Deuterophoma* were excluded from *Phoma* sect. *Plenodomus*, seventeen of them being non-scleroplectenchymatous species of *Phoma*. *Asteromella cocogena, Asteromella pomi* and *Phoma versabilis* are described as new species and twelve new combinations are proposed: *Ascochyta aggregata* (Höhnel), *Cytosporella cenangium* (Corda), *Fusicoccum hoveniae* (Gucevicz), *Phacidiella hiemalis* (Desm.), *Phoma cruenta* (Sydow), *Phoma filarszkyana* (Moesz), *Phoma haematites* (Petrak), *Phoma syriaca* (Petrak), *Phomopsis allescheriana* (P. Henn.), *Phomopsis destruens* (Harter), *Pleurophoma cava* (Schulzer) and *Pyrenochaeta corni* (Batista & Vital).

The species, subspecies and varieties at present classified in *Phoma* sect. *Plenodomus* (Preuss) Boerema et al. have been treated in Contribution III–1 of this series (Boerema et al., 1994)[4]. They are characterized by their ability to produce scleroplectenchyma in the peridium of the pycnidium, i.e. hyaline cells with thick walls and a relatively small lumen. Many of these anamorphs, especially those occurring on herbaceous plants, are metagenetically related to scleroplectenchyma-producing species of the Ascomycete genus *Leptosphaeria* Ces. & de Not. (group *doliolum* Holm, 1957). Four genera have been successively assigned to the section, as *Plenodomus* Preuss, *Diploplenodomus* Died., *Leptophoma* Höhnel and *Deuterophoma* Petri. However, not all species formerly placed in these genera appeared to belong to *Phoma* sect. *Plenodomus*. The type species of the section, *Phoma lingam* (Tode: Fr.) Desm., teleomorph *Leptosphaeria maculans* (Desm.) Ces. & de Not., is very variable. This may explain why the anamorph and teleomorph of this fungus have been confused with various other fungal morphs.

Firstly, this paper lists alphabetically all species now removed from the above four genera. Then, the taxonomic part deals with the misapplications of *P. lingam/L. maculans*, followed by the species which have been erroneously attributed in the past to the generic synonyms of the section *Plenodomus* ('Excluded species'; in alphabetical order of their epithets). An appendix deals with some additional collections within the section *Plenodomus*, treated in Contribution III–1.

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4) Contribution I deals with species of sect. *Phoma* (de Gruyter & Noordeloos, 1992; de Gruyter et al., 1993). Contribution II deals with the species classified in sect. *Peyronellaea* (Boerema, 1993).

MATERIAL AND METHODS

Original descriptions and, where possible, original herbarium material have been studied in the light of the present knowledge of coelomycetous genera, in particular the comparative type studies of Coelomycetes by Sutton (1980). Drawings were made with the help of a drawing tube (oil-immersion at × 1250). The presence or absence of scleroplectenchyma was checked by staining thick sections with Lugol's iodine: cell-walls becoming red by adsorption of the iodine (JKJ+) or remaining white by non-adsorption (JKJ–). Herbaria and culture collections are coded according to, respectively, Holmgren & Keuken (1974) and Pridham (1974).

INDEX OF THE DEUTEROPHOMA, DIPLOPLENODOMUS, LEPTOPHOMA AND PLENODOMUS NAMES FOUND IN LITERATURE AND HERBARIUM COLLECTIONS[5]

The annotated *Phoma*-synonyms belong to sect. *Plenodomus* and are discussed and documented in Contribution III–1. The numbers 1–45 refer to species excluded from sect. *Plenodomus* and are treated in the taxonomic part of this paper.

Deuterophoma '*Chrysanthemum* spp.' [vascular pathogen]	no. 9
– *tracheiphila* Petri	≡ *Phoma tracheiphila* (Petri) Kant. & Gik.
– *ulmi* (Verrall & May) Goid. & Rugg.	no. 42
Diploplenodomus aggregatus Höhnel	no. 1
– *malvae* Died. ex Died.	= *Phoma doliolum* P. Karsten (teleom. *Leptosphaeria conoidea* (de Not.) Sacc.)
– *microsporus* (Berl.) Höhnel	= idem
– *piskorzii* Petrak	≡ *Phoma piskorzii* (Petrak) Boerema & Loerakker (teleom. *Leptosphaeria acuta* (Fuckel) P. Karsten)
– *rivini* (Allescher) Petrak	no. 37
Leptophoma acuta (Hoffm.: Fr.) Höhnel [as '(Fuck.)']	≡ *Phoma acuta* (Hoffm.: Fr.) Fuckel subsp. *acuta* (teleom. *Leptosphaeria doliolum* (Pers.: Fr.) Ces. & de Not. subsp. *doliolum*)
– *doliolum* Höhnel	= *Phoma acuta* subsp. *errabunda* (Desm.) Boerema et al. (teleom. *Leptosphaeria doliolum* subsp. *errabunda* Boerema et al.)
– *paeoniae* Höhnel	no. 33
– *urticae* (Schulzer & Sacc.) Höhnel	no. 43

5) Knowingly omitted are four species of *Diploplenodomopsis* Petrak which have been erroneously listed under *Diploplenodomus* ('*D. bacillaris*', '*D. campanulae*', '*D. cylindrica*' and '*D. ragusina*') in the third volume of the Index to Petrak's papers by Samuels (1983).

Plenodomus aconiti Petrak	= *Phoma doliolum* P. Karsten (teleom. *Leptosphaeria conoidea* (de Not.) Sacc.)
– *acutus* (Hoffm.: Fr.) Bubák	≡ *Phoma acuta* (Hoffm.: Fr.) Fuckel subsp. *acuta* (teleom. *Leptosphaeria doliolum* (Pers.: Fr.) Ces. & de Not. subsp. *doliolum*)
– *acutus* (Hoffm.: Fr.) Petrak [both as '(Fuck.)']	
– *astragalinus* (Gonz.-Frag.) Petrak	≡ *Phoma astragalina* (Gonz.-Frag.) Boerema & v. Kest.
– *borgianus* Sacc.	no. 2
– *brachysporus* Petrak	no. 3
– *cannabis* (Allescher) Moesz & Smarods	no. 4
– '*cannabis* Moesz & Smarods n. spec.' in Petrak [an error of citation]	
– '*cardaminis* Rupprecht' 'n. sp.' in herb. B [manuscript name]	no. 5
– *cenangium* (Corda) Oud.	no. 6
– *chelidonii* Naumov	no. 7
– *chenopodii* (P. Karsten & Hariot) v. Arx	no. 8
– *chondrillae* Died.	= *Phoma agnita* Gonz.-Frag. (teleom. *Leptosphaeria agnita* (Desm.) Ces. & de Not.)
– '*chondrillae*' sensu Batista & Vital	= *Phoma enteroleuca* Sacc. var. *enteroleuca*
– *cocogenus* Saw. [as '*cocogena*'; not validly published]	no. 10
'*complanatus* (Tode: Fr.) Rupprecht', comb. nov. in herb. B[manuscript name]	no. 11
– *corni* Batista & Vital	no. 12
– *cruentus* Sydow	no. 13
– *destruens* Harter	no. 14
– *dianthi* Bubák	= *Phoma astragalina* (Gonz.-Frag.) Boerema & v. Kest.
– *doliolum* (Höhnel) Höhnel	= *Phoma acuta* subsp. *errabunda* (Desm.) Boerema et al. (teleom. *Leptosphaeria doliolum* subsp. *errabunda* Boerema et al.)
– *doliolum* (Höhnel) Petrak	
– '*drobnjacensis* Bubák' in herb. BKL [manuscript name]	≡ *Phoma drobnjacensis* Bubák
– *erythrinae* Oud.	no. 15
– *eucalypti* Alm. & Cam.	no. 16
– *filarszkyanus* (Moesz) Petrak	no. 17
– *fusco-maculans* (Sacc.) Coons	no. 18

(Plenodomus contd)

– *'fusco-maculans'* sensu Coons	= *Phoma coonsii* Boerema & Loerakker
– *'galeopsidis* Rupprecht' nov. sp. ['*m.*'] in herb. B [manuscript name]*	= *Phoma doliolum* P. Karsten (teleom. *Leptosphaeria conoidea* (de Not.) Sacc.)
– *gallarum* (Lév.) Oud.	no. 19
– *gentianae* (Moesz) Petrak	= *Phoma pedicularis* Fuckel
– *'glechomae* Rupprecht' 'n. sp.' in herb. B [manuscript name]*	= *Phoma enteroleuca* Sacc. var. *enteroleuca*
– *haematites* Petrak	no. 20
– *helicis* Curzi & Barbaini	= *Phoma pezizoides* (Ell. & Ev.) Boerema & v. Kest.
– *helveticus* Petrak	= *Phoma pedicularis* Fuckel
– *herbarum* Allescher	no. 21
– *hoveniae* Gucevicz	no. 22
– *humuli* Kusnetz. [as *'humulis'*]	no. 23
– *inaequalis* Sacc. & Trotter	no. 24
– *karii* Petrak	= *Phoma pedicularis* Fuckel
– *khorasanicus* Petrak	= *Phoma astragalina* (Gonz.-Frag.) Boerema & v. Kest.
– *labiatarum* Petrak	= *Phoma doliolum* P. Karsten (teleom. *Leptosphaeria conoidea* (de Not.) Sacc.)
– *leonuri* (Let.) Moesz & Smarods	≡ *Phoma leonuri* Let. (teleom. *Leptosphaeria slovacica* Picb.)
– *lingam* (Tode: Fr.) Höhnel	≡ *Phoma lingam* (Tode: Fr.) Desm. (teleom. *Leptosphaeria maculans* (Desm.) Ces. & de Not.)
– *lunariae* Sydow	≡ *Phoma sublingam* Boerema (teleom. *Leptosphaeria submaculans* Holm)
– *macrocapsa* (Trail) Rupprecht	≡ *Phoma macrocapsa* Trail
– *macropodii* Petrak	no. 25
– *'Malus pumila'* [spotted apples]	no. 26
– *meliloti* Dearn. & Sanford	= *Phoma sclerotioides* (Preuss) Sacc.
– *meliloti* Mark.-Let.	= idem
– *metasequoiae* Gucevicz	no. 27
– *microsporus* Berl.	= *Phoma doliolum* P. Karsten (teleom. *Leptosphaeria conoidea* (de Not.) Sacc.)
– *mollerianus* Bres.	no. 28
– *mori* (Mont.) Höhnel	no. 29
– *niesslii* Petrak	≡ *Phoma petrakii* Boerema & v. Kest. (?teleom. *Leptosphaeria suffulta* (Nees: Fr.) Niessl)
– *nigricans* Negodi	no. 30

(Plenodomus contd)

– *oleae* Cav.	no. 31
– *origani* (Mark.-Let.) Petrak [see Errata on p. 190]	= *Phoma doliolum* P. Karsten (teleom. *Leptosphaeria conoidea* (de Not.) Sacc.)
– '*orthoceras* Höhnel' [as '(Fr.)'] [in herb. W [manuscript name]	no. 32
– *prominens* (Bres.) Petrak ex v. Arx	= *Phoma pedicularis* Fuckel
– '*pulcherrimus* Petrak' 'n. sp.' in herb. Petrak, W [manuscript name]	no. 34
– *pyracanthae* Gucevicz	no. 35
– *rabenhorstii* Preuss	= *Phoma lingam* (Tode: Fr.) Desm. (teleom. *Leptosphaeria maculans* (Desm.) Ces. & de Not.)
– '*rabenhorstii*' sensu Riggenbach	no. 12
– *ramealis* (Desm.) Höhnel	no. 36
– *rostratus* Petrak	= *Phoma sydowii* Boerema et al. (?teleom. *Leptosphaeria senecionis* (Fuckel) Winter)
– *ruttneri* Petrak	≡ *Phoma ruttneri* (Petrak) Boerema & v. Kest. (?teleom. *Leptosphaeria affinis* P. Karsten)
– *salicum* (Sacc.) Died.	= *Phoma pezizoides* (Ell. & Ev.) Boerema & v. Kest.
– *sclerotioides* Preuss	≡ *Phoma sclerotioides* (Preuss) Sacc.
– '*scrophulariae* Rupprecht' 'n. sp.' in herb. B [manuscript name]*	= *Phoma acuta* subsp. *errabunda* (Desm.) Boerema et al. (teleom. *Leptosphaeria doliolum* subsp. *errabunda* Boerema et al.)
– *senecionis* (Sydow) Bubák	≡ *Phoma sydowii* Boerema et al.
– *senecionis* (Sydow) Petrak	(?teleom. *Leptosphaeria senecionis* (Fuckel) Winter)
– *sorghi* Morochkovskii	= *Phoma sclerotioides* (Preuss) Sacc.
– *sphaerosporus* Petrak	= *Phoma pedicularis* Fuckel
– *spurius* (Vestergren) Petrak	no. 38
– *strobilinus* (Desm.) Höhnel	no. 39
– *svalbardensis* Lind*	= *Phoma pedicularis* Fuckel
– *sylvaticus* (Sacc.) Rupprecht [as '*silvatica*']	no. 40
– '*sylvaticus*' sensu Rupprecht	= *Phoma petrakii* Boerema & v. Kest. (?teleom. *Leptosphaeria suffulta* (Nees: Fr.) Niessl)
– *syriacus* Petrak	no. 41
– *valentinus* Caballero	no. 44
– *verbascicola* (Schw.) Moesz	no. 45

(Plenodomus contd)	
– *'verbascicola'* sensu Moesz	= *Phoma acuta* subsp. *errabunda* (Desm.) Boerema et al. (teleom. *Leptosphaeria doliolum* subsp. *errabunda* Boerema et al.)
– *vincetoxici* Petrak	= *Phoma doliolum* P. Karsten (teleom. *Leptosphaeria conoidea* (de Not.) Sacc.)
– *wallneriana* (Allescher) Bubák	= *Phoma pezizoides* (Ell. & Ev.) Boerema & v. Kest.

*) See documentation in the Appendix on p. 183–185.

TAXONOMIC PART

Phoma sect. *Plenodomus* (Preuss) Boerema et al., Trans. Br. mycol. Soc. 77 (1981) 61; generic synonyms *Plenodomus* Preuss (1851), *Diploplenodomus* Diedicke (1912a), *Leptophoma* Höhnel (1915a) and *Deuterophoma* Petri (1929). On herbaceous and woody plants; on herbaceous plants often associated with teleom. *Leptosphaeria* Cesati & de Notaris (1863; nom. cons.) gr. *doliolum* (Holm, 1957).

Type species: *Plenodomus rabenhorstii* Preuss = *Phoma lingam* (Tode: Fr.) Desm., Annls Sci. nat. (Bot.) 3, 11 (1849) 28; teleom. *Leptosphaeria maculans* (Desm.) Cesati & de Notaris (1863). Serious pathogen of *Brassica* spp.; also occurring on other cruciferous plants.

Selected literature. Boerema & van Kesteren (1981a), Boerema et al. (1981b), Boerema, Pieters & Hamers (1993; under *Leptosphaeria maculans*), Boerema, de Gruyter & van Kesteren (1994; = Contribution III–1).

Misapplications of the type species name in literature or exsiccata works (incl. teleomorph)

As noted in Contribution III–1, *Phoma lingam* (teleomorph *Leptosphaeria maculans*) is extremely variable in its morphology, cultural characteristics and pathogenicity, and so one needs to be aware of the earlier misapplications listed below. Muller & Tomašević (1957) remarked that *L. maculans* grows saprophytically on plants of quite different families. However, all records of the fungus on non-cruciferous plants that we have examined appeared to be based on misidentifications!

CRUCIFEROUS MATRICES

On *Berteroa incana* stem as *'Leptosphaeria maculans'*.

Coll. J. Smarods, distr. Riga, prov. Vidzeme, Latvia (Letland). Krypt. exs. Mus. Hist. Nat. Vind. No. 3608 [ed. Mus. Palatino, Vind.] (e.g. UPS), referred to by Smith & Sutton (1964; IMI 37207).

= *Leptosphaeria submaculans* Holm, a very close but distinct species of gr. *doliolum*. Det. Holm (1957: 38). The anamorph of this fungus has been differentiated as *Phoma sublingam* Boerema, see Contribution III–1 no. 16.

On *Brassica oleracea* stem as '*Phoma lingam* f. *sphaerulis bysso immersis*'.

Coll. J.B. Mougeot, Dep. l'Aude, France. Distributed by Roumeguère as Fungi sel. gall. exs. [= Fungi gall. exs. Cent. 1/4] No. 364 (1879) [= duplicate of Mougeot & Nestler, Stirp. crypt. Vog.-Rhen. No. 1076 as *Sphaeria olerum* Fr. (Reliquiae Mougeotianae) (e.g. L)].

= *Arnium olerum* (Fr.: Fr.) Lundq. & Krug, common in Europe on cabbage stalks, but also recorded on other herbaceous plants and dung, see Lundqvist (1972). Roumeguère's alteration of the original name *Sphaeria olerum* was based on a 'rectification' by Mougeot in Stirp. crypt. Vog.-Rhen. No. 1271, who suggested *S. olerum* was conspecific with the earlier described *S. lingam* Tode. This also explains why Tulasne & Tulasne (1863) and Von Höhnel (1911) have listed *Sphaeria olerum* 'Mougeot' as a synonym of *Sphaeria lingam* and *Plenodomus lingam*.

On *Brassica oleracea* stalk as '*Plenodomus lingam*'.

Coll. A. Ludwig, Forbach, Lotharingen (Lorraine), France. Distributed as Sydow, Mycoth. germ. No. 1123 (1912) (e.g. PAD, U).

On *Brassica oleracea* var. *capitata* stem and root as '*Plenodomus rabenhorstii*'.

Coll. O. Jaap, Triglitz, reg. Prignitz, Brandenburg, Germany, distributed as Jaap, Fungi sel. exs. No. 541 (e.g. L, U); discussed in Verh. bot. Ver. Prov. Brandenb. 56 (1914) 89 under '*Plenodomus lingam*'; earlier referred to by Diedicke (1912b). Jaap (l.c.) remarked that at the same location he found a similar fungus on another crucifer, *Hesperis matronalis*, and also on *Conium maculatum* (Umbelliferae; see below under non-cruciferous matrices).

= *Phoma doliolum* P. Karsten, a plurivorous member of sect. *Plenodomus* with relatively large conidia, see Contribution III–1 no. 19. Teleomorph *Leptosphaeria conoidea* (de Not.) Sacc.

Isol. stem *Brassica oleracea* var. *bullata* as '*Phoma lingam*'.

Isolate made by Moers, 17 Dec. 1957 and deposited at BBA (No. 8615). Detailed described by Kranz (1963: 'Isolierung 27') in comparison with various *Phoma*-isolates from potatoes; also studied by Breyer (1963) and Maas (1965) in comparison with the causal fungus of footrot of flax.

= *Phoma exigua* Desm. var. *exigua*, the plurivorous type species of *Phoma* sect. *Phyllostictoides* (van der Aa et al., 1990). Det. Maas, l.c. Some diagnostic data are given in this paper under Excluded species no. 4 (*Plenodomus cannabis*).

Isol. seed *Brassica* sp. as '*Phoma lingam*'.

Isolate PD-14 July 1958 deposited at CBS (C.J. Briejèr). Identification CBS cf. confusing data in Grove (1935), see discussion by Smith & Sutton (1964: 163).

= *Phoma herbarum* Westend. (syn. *P. oleracea* Sacc.), the saprophytic type species of *Phoma* sect. *Phoma* which commonly occurs on seed of brassicas, see Boerema (1964, fig. 3). Some diagnostic data are given in this paper under Excluded species no. 43 (*Leptophoma urticae*).

On *Descurainia (Sisymbrium) sophia* stem as '*Leptosphaeria maculans*'.

Coll. J.C. Fischer, Stralsund, Mecklenburg, Germany. Distributed as Rabenh., Fungi europ. exs./ Klotzschii Herb. mycol. Cont. No. 2050 (1876) (e.g. B).

Coll. O. Jaap, Warnemunde near Rostock, Mecklenburg, Germany. Distributed as Jaap, Fungi sel. exs. No. 109 (e.g. B), listed in Verh. bot. Ver. Prov. Brandenb. 49 (1907) 15.

= *Leptosphaeria conferta* Niessl ex Sacc. (gr. *doliolum*). Det. Holm (1957). Often confused with *L. maculans* and *L. submaculans*. Anamorph *Phoma conferta* Sydow ex Died., see Contribution III–1 no. 9.

On *Hesperis matronalis* stem as '*Plenodomus lingam*'.

Coll. O. Jaap, Triglitz, reg. Prignitz, Brandenburg, Germany, cf. discussion of Jaap, Fungi sel. exs. No. 541 in Verh. bot. Ver. Prov. Brandenb. 56 (1914) 89.

= *Phoma doliolum* P. Karsten, teleomorph *Leptosphaeria conoidea* (de Not.) Sacc.; see the documentation under *Brassica oleracea*, second paragraph.

On *Sisymbrium loeselii* stem as '*Leptosphaeria maculans*'.

Coll. P. Sydow, Berlin, Germany. Distributed by O. Pazschke in Rabenh. & Winter, Fungi europ. extraeur. exs. No. 4158 (1898) (e.g. B, UPS).

= *Leptosphaeria submaculans* Holm (see also above under *Berteroa incana*). The specimen No. 4158 in UPS represents its holotype, see Holm (1957). This type specimen also contains some old pycnidia of the anamorph *Phoma sublingam* Boerema (type I), see Contribution III–1 no. 16.

NON-CRUCIFEROUS MATRICES

On *Ailanthus altissima* wood (Simaroubaceae; identification Dep. Silviculture. Agric. Univ. Wageningen, the Netherlands) as '*Plenodomus rabenhorstii*'.

Coll. G.T. Preuss, Hoyerswerda, Ober Lausitz, Germany. Distributed as Rabenh., Klotzschii Herb. mycol. No. 1282 (1849) ('ad ligna vetusta') (e.g. B, M).

= *Phoma pezizoides* (Ell. & Ev.) Boerema & v. Kest. A wood-inhabiting member of sect. *Plenodomus*. Det. Boerema & van Kesteren (1981). See also Contribution III–1 no. 26. This collection explains Preuss' annotation (1862) that *Plenodomus rabenhorstii* also occurs on wet old wood.

On *Artemisia campestris* stem (Compositae) as '*Leptosphaeria maculans* with *Phoma* and *Camarosporium* anamorphs'.

Coll. E. Müller, Jouques, Dep. Var, France, 19 June 1956. Culture studied by Müller & Tomašević (1957), referred to by Lucas (1963: 362) and Lacoste (1965: 28) (ETHZ-cult. M2651).

= *Leptosphaeria ogilvensis* (Berk. & Br.) Ces. & de Not., cf. rectification by Müller (1971). Monoascosporic isolates of the plurivorous *L. ogilvensis* by Lucas (1959) did not produce conidial anamorphs (SHEFF dried cult. 2046, 2048, 2301). Within one month transfers of isolate ETHZ-M2651 on malt agar (1974) developed in *Camarosporium affine* Saccardo et al. (Bommer & Rousseau, 1887: 224–225; holotype PAD); the cultural characteristics were quite different from those of the SHEFF-isolates and CBS 233.58 of *L. ogilvensis*. Therefore the cultures are unlikely to represent a single fungus.

On *Conium maculatum* (Umbelliferae) and unidentified umbellifer stems as '*Phoma lingam*'.

Listed as hosts by Saccardo & Marchal (1885); the collections on which these records are based could not be traced.

= Probably *Phoma acuta* subsp. *errabunda* (Desm.) Boerema et al., which produces conidia similar to those of *P. lingam*, and frequently occurs in Europe on dead stems of Umbelliferae, see Contribution III–1 no. 15b (teleom. *Leptosphaeria doliolum* subsp. *errabunda* Boerema et al.). See also below under *Linaria genistifolia*.

On *Conium maculatum* stem (Umbelliferae) as '*Plenodomus lingam*'.

Coll. O. Jaap, Triglitz, reg. Prignitz, Brandenburg, Germany, cf. discussion of Jaap, Fungi sel. exs. No. 541 in Verh. bot. Ver. Prov. Brandenb. 56 (1914) 89; collection earlier referred to by Diedicke (1912b).

= *Phoma doliolum* P. Karsten, a large-spored plurivorous member of sect. *Plenodomus*, esp. common on umbellifers; teleomorph *Leptosphaeria conoidea* (de Not.) Sacc. This fungus is treated in Contribution III–1 no. 19.

On *Chamaenerion (Epilobium) angustifolium* stem (Onograceae) as '*Leptosphaeria maculans*'.

Coll. P. Morthier, Corçelles near Neuchâtel, Switzerland. Distributed as Thümen, Mycoth. univ. No. 459 (1876) (e.g. UPS), referred to by Müller (1950).

= *Leptosphaeria cylindrospora* Auersw. & Niessl ex Sacc. Det. Holm (1957: 41). A distinctive species on *Chamaenerion* and *Epilobium* spp. marked by four-spored asci. Curiously Müller l.c. united *L. cylindrospora* with *L. maculans*.

On *Hibiscus rosa-sinensis* (Malvaceae) as '*Phoma lingam*'.

Listed as host by Mathur (1979: 177) cf. Thesis U. Varma, Univ. Bhagalpur, 1976, Bihar, India.

= Probably *Phoma multirostrata* var. *microspora* (Allescher) Boerema. *Hibiscus* spp. are known to be very susceptible to the pathogenic varieties of *P. multirostrata* (Mathur et al.) Dorenb. & Boerema, a very common soil-borne fungus in India, see Boerema (1986). The pycnidia and conidia of var. *microspora* closely resemble those of *Phoma lingam* (type I). It is likely that isolates of '*P. lingam*' recorded from the rhizosphere of *Argemone mexicana* (Papaveraceae) in and around Bhagalpur (Verma, 1977) are also *P. multirostrata* var. *microspora*.

On *Linaria genistifolia* stem (Scrophulariaceae) as '*Phoma lingam*'.

Coll. Keissler, Szent-György near Pozsony, Hungary (now Svätý Jur near Bratislava, Slovakia). Distributed as Krypt. exs. Mus. Hist. Nat. Vind. No. 1171 [ed. Mus. Palatino, Vind.] (e.g. L.).

= *Phoma acuta* subsp. *errabunda* (Desm.) Boerema et al. The most common plurivorous member of sect. *Plenodomus*, see Contribution III–1 no. 15b. Teleomorph *Leptosphaeria doliolum* subsp. *errabunda* Boerema et al. [It should be noted that *Phoma lingam* f. *linariae* Sacc. & Paoli (Saccardo, 1889) refers to *P. pedicularis* Fuckel, another species of sect. *Plenodomus*, see Contribution III–1 no. 20.]

On *Lupinus albicaulis* var. *shastensis* stem (Leguminosae) as '*Leptosphaeria maculans*'.

Coll. Wm.B. Cooke, Mt Shasta, California, USA (DAOM: Wm.B.C. 20294).

= *Leptosphaeria ogilvensis* (Berk. & Br.) Ces. & de Not. Det. Shoemaker (1984: 2709).

This plurivorous fungus is often confused with *L. maculans*, see the identification note under *Artemisia campestris*.

On *Phaseolus* sp. stem (Leguminosae) as '*Pleospora maculans*' (nomenclatural synonym of *Leptosphaeria maculans*).

Ref. Tulasne & Tulasne (1863), France: "in winter time and in spring on dry stems of *Brasssica campestris* and of a species of *Phaseolus* we have found it more than once on each host in the neighbourhood of Versailles" (translation W.B. Grove, 1931).

= Indeterminable from available data. It was certainly not *L. maculans*. [There are two other records of this fungus on beans, namely on *Phaseolus nanus*, see next paragraph (misapplied) and on *Phaseolus lunatus* (Sieva bean) in catalogue ATCC no. 18144 as *Phoma lingam*. In the latter case the host name was incorrect; the original culture PD 65/630 has been isolated from Brussels sprout, *Brassica oleracea* var. *gemmifera*.]

On *Phaseolus nanus* stem (Leguminosae) as '*Leptosphaeria maculans*'.

Coll. van der Trappen, Naaldwijk, the Netherlands, Febr. 1867, original labelled '*Pleospora maculans*', referred to by Oudemans (1897: 289–290) (preserved in herb. Oudemans, L.).

= *Pleospora tarda* E.G. Simmons [anamorph *Stemphylium botryosum* Wallr.; see Boerema, Pieters & Hamers, 1993], a plurivorous Ascomycete quite different from *L. maculans*. Identification apparently based on external appearance and the record of '*Pleospora maculans*' on *Phaseolus* sp. by the brothers Tulasne

(1863; see above). Oudemans's description is only a French translation of the Latin diagnosis of *L. maculans* by Saccardo (1883: 35).

On *Swertia perennis* stem (Gentianaceae) as '*Leptosphaeria maculans*'.

Coll. D. Cruchet, Tourbière de La Chaux (Ste. Croix), Cant. Vaud (Waadt), Switzerland. Referred to by Müller (1950) (preserved in herb. Cruchet, LAU).

= *Leptosphaeria agnita* (Desm.) Ces. & de Not. (gr. *doliolum*). A plurivorous species close to *L. ogilvensis*. Det. Dr. L. Holm (pers. inf. 1980). Anamorph *Phoma agnita* Gonz.-Frag., see Contribution III–1 no. 5.

Misapplications of the generic synonyms *Plenodomus*, *Diploplenodomus*, *Leptophoma* and *Deuterophoma*: Excluded species nos 1–45

The forty-five excluded species are treated in alphabetical order by epithet.

In the past, the above generic synonyms have been repeatedly misinterpreted, even by experienced mycologists. Von Höhnel (1909) treated *Plenodomus* Preuss initially as an older synonym of *Phomopsis* (Sacc.) Sacc. (background of the misapplications nos 7, 23, 29, 32, 36, 39 and 44). It explains the introduction of *Leptophoma* Höhnel (1915a), which was based on the typical *Plenodomus*-anamorph of *Leptosphaeria doliolum* (Pers.: Fr.) Ces. & de Not. on dead stems of stinging nettle, *Urtica dioica*. However, the scleroplectenchymatous wall structure was not noticed as an essential character (misappl. no. 33) and a proposed change in the description of *Leptophoma* by Von Höhnel (1917: 262–263) also erroneously includes the conidiogenous characteristics of a *Pyrenochaeta* species which occasionally occurs on dead stems of nettle (misappl. no. 43). In 1918 Von Höhnel finally accepted the synonymy of his *Leptophoma* with the earlier *Plenodomus*. Diedicke (1911, 1912a, b) usually interpreted *Plenodomus* correctly (except in case no. 21) and separated *Diploplenodomus* for species with some 1-septate conidia. The type species of *Deuterophoma* Petri (1929; referring to still closed scleroplectenchymatous pycnidia) additionally produces conidia on free conidiogenous cells on the mycelium: *Phialophora* synanamorph. This phenomenon, however, may also occur in non-scleroplectenchymatous vascular-inhabiting *Phoma*-like fungi (misappl. nos 9 and 42). Oudemans (1885, 1897) did not fully understand the generic characteristics of *Plenodomus* (misappl. nos 6, 15 and 19). The same holds for Saccardo (1903, 1913; misappl. nos 2 and 24) and various other authors of *Plenodomus*-binomials (misappl. nos 4, 5, 8, 10, 11, 13, 14, 16, 21, 22, 26, 27, 28, 30, 31 and 35). Various typical species of *Plenodomus* are described by Petrak (see Contribution III-1), but occasionally he did not give due consideration to the wall structure (misappl. nos 37 and 38). He emphasizes the metagenetic relation with *Leptosphaeria* species (Petrak, 1947; misappl. nos 3, 17, 20 and 34), but also associated *Plenodomus* with species of *Didymella* (see Boerema & van Kesteren, 1981: 325 and misappl. nos 25 and 41).

In Coelomycetes the occurrence of scleroplectenchyma is admittedly not restricted to *Phoma* sect. *Plenodomus* [neither in Ascomycetes is it restricted to *Leptosphaeria* gr. *doliolum*] (misappl. nos 1 and 12).

Finally it appeared that some combinations in *Plenodomus* have been based on misidentified specimens (misappl. nos 18, 40 and 45), i.e. confused with species truly belonging to sect. *Plenodomus*.

1. **Diploplenodomus aggregatus** Höhnel

Diploplenodomus aggregatus Höhnel, Annls mycol. 16 (1918) 70.

Material examined. Two collections, originally labelled *Scleroderris aggregata* (Lasch) Rehm, in the Fungi Islandiae: No. 194 on basal parts of stems of *Euphrasia* sp. (Scrophulariaceae), Breiddalsvik, distr. Sudur Múlasýsla, Iceland: coll. I. Jörstad, 21 July 1939 and No. 332 on stem pieces of *Euphrasia* sp., Svinkolar i Lóni, distr. Austur Skaftafellssýsla, Iceland: coll. I. Jörstad, 26 July 1939 (O).

IDENTIFICATION

≡ ***Ascochyta aggregata*** (Höhnel), *comb. nov.*

The pycnidia of this anamorph (Fig. 1) are stromatic-scleroplectenchymatous, up to 500 µm diam., with 1–2 closed or poroid locules. They have a *Plenodomus*-like wall structure (JKJ+), comparable with that of *Phoma sclerotioides* Preuss ex Sacc. (Contribution III–1 no. 3). However, the conidia and conidiogenesis deviate. The relatively large cylindrical conidia, (14.5–)17–22(–24) × 2–3 µm, arise as thin-walled outgrowths. At maturity they always become 1-septate as in true species of *Ascochyta* Lib. (Boerema & Bollen, 1975; Boerema, 1984: fig. 7, wall-thickening septation). The suggested obligate septation of the conidia could not be checked in vitro and the disposition is therefore provisional. However, the pycnidial wall structure, being typically *Plenodomus*-like, is quite

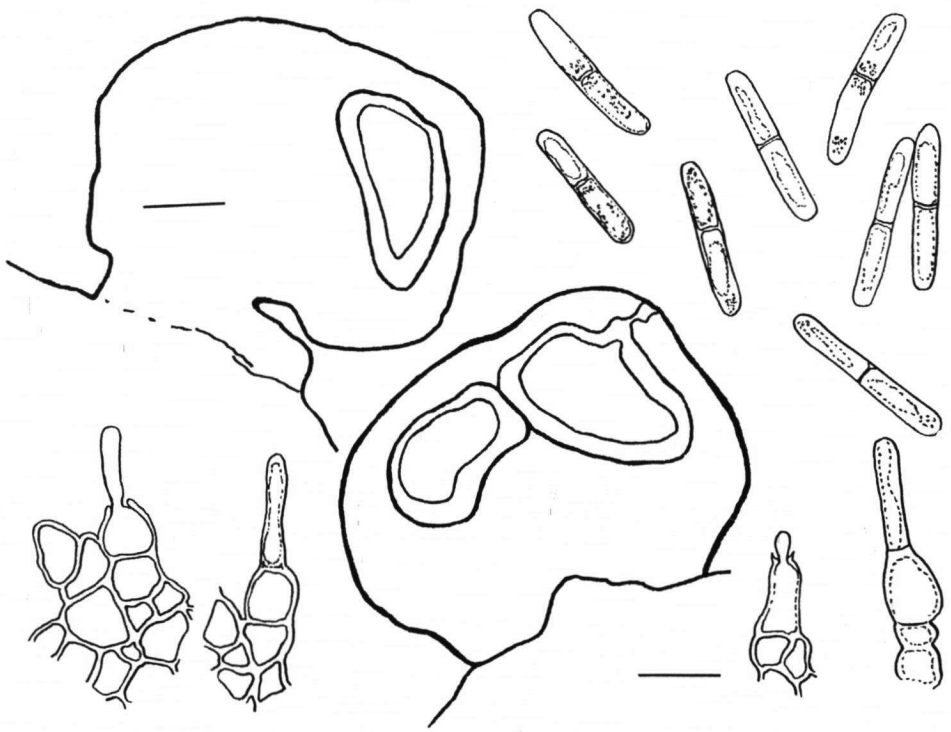

Fig. 1. *Ascochyta aggregata*. Conspicuous large scleroplectenchymatous pycnidia ('*Plenodomus*-like'). The conidia arise as thin-walled cylindrical outgrowths; at maturity they always become 1-septate. Drawings from Fungi Islandiae No. 194, labelled *Scleroderris aggregata* (O). Bar pycnidia 100 µm. Bar conidia 10 µm.

distinct from that of 'common' *Ascochyta* spp. and if species of *Ascochyta* with this type of wall are ever detected, they could then be classified with the above species in a separate section of *Ascochyta*.

Diploplenodomus aggregata has been proposed as the anamorph of *Sclerodothis aggregata* (Lasch) Höhnel, type species of the Ascomycete genus *Sclerodothis* Höhnel. The latter genus is very close to *Leptosphaeria* Ces. & de Not., see Von Höhnel l.c. and Holm (1957: 36). A single identity of both morphs is plausible but not yet proved in cultural experiments.

2. **Plenodomus borgianus** Sacc.

Plenodomus borgianus Saccardo, Annls mycol. 11 (1913) 17–18.

Material examined. Type on skin of pumpkin fruit, *Cucurbita pepo* (Cucurbitaceae), S. Martin, Malta: coll. Caruana-Gatto, Oct. 1911 (Herb. Saccardo, PAD).

IDENTIFICATION

= ***Phomopsis*** sp.

The type collection of *Plenodomus borgianus* was examined by Dr. B.C. Sutton (IMI) who wrote to us: "I think there is no doubt about this being a species of *Phomopsis* producing α-conidia." The fungus is characterized by biguttulate fusiform conidia, (5–)5.5–6.5(–7) × 2 µm, formed from verticillately branched conidiophores with terminal phialides, and thick-walled, initially 'sclerotioid' pycnidia, separate or aggregate, up to 700 µm diam. There are no other records of such a fungus on Cucurbitaceae. The species is quite different from *Phomopsis cucurbitae* McKeen (1957) [with α- and β-conidia], the causal organism of 'Fruit- and Stem rot' of cucurbits, and *Phomopsis sclerotioides* van Kesteren (1967) [with short, only occasionally septate conidiophores], causing 'Black Root Rot' in Cucurbitaceae. There is, however, a strong resemblance to *Phomopsis obscurans* (Ell. & Ev.) Sutton (1965), a cosmopolitan recorded foliicolous pathogen of *Fragaria* spp. ('Strawberry Leaf Blight'). The latter grows very well on various artificial media and then often produces large stromatic masses of aggregated pycnidia. An accidental occurrence of *Phomopsis obscurans* on pumpkin fruit is quite well possible. [Such casual findings are often associated with various pathogenic *Phoma* spp., see Boerema, 1975.]

3. **Plenodomus brachysporus** Petrak

Plenodomus brachysporus Petrak, Annls mycol. 21 (1923) 197–199.

Material examined. Type on stem pieces of *Lavatera* sp. (Malvaceae), Gurein near Brunn, Mahren (now Kŭrim near Brno, Jihomoravsky), Czechia (former Czechoslovakia): coll. J. Hruby, May 1922 (Herb. Petrak, W).

IDENTIFICATION

= ***Phoma labilis*** Sacc., Michelia 2 (2) (1881) 341, with reference to description in Michelia 1 (2) (1878) 258 [as '*Phoma malvacearum* West.' (misapplied; ≡ *Phomopsis malvacearum* (Westend.) Grove)]; Sylloge Fung. 3 (1884) 122.

Petrak's (l.c.) classification of this obviously thin-walled pycnidial anamorph in *Plenodomus* rested on a casual association with a species of *Leptosphaeria* with *doliolum*-type wall structure. The characteristics of the type collection of *Plenodomus brachysporus* – subglobose papillate pycnidia, 150–250 µm diam., conidia mostly 4–6 × 2–3 µm (Fig.

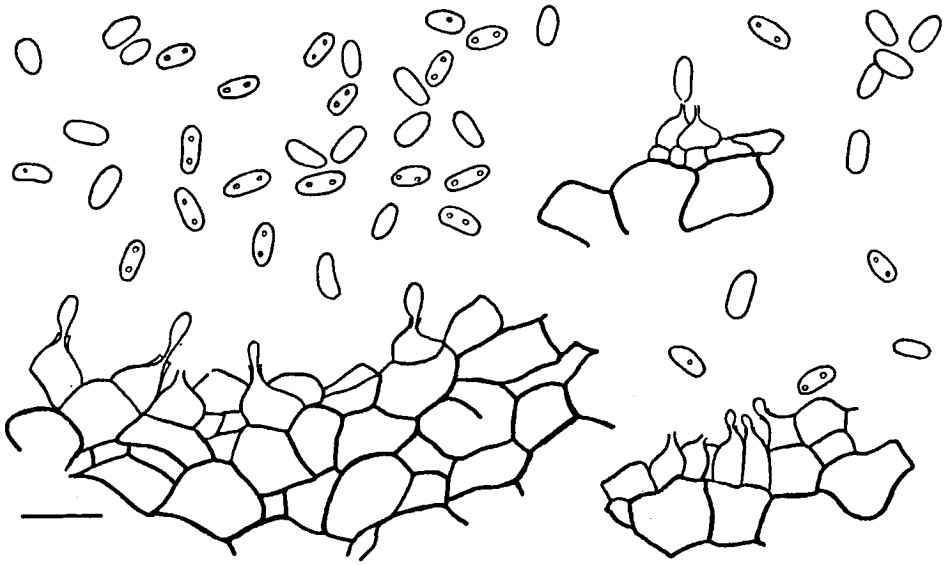

Fig. 2. *Phoma labilis*. Drawings of conidia and conidiogenous layer in vivo on *Lavatera* sp., from type of the synonym *Plenodomus brachysporus* (W). Bar 10 µm.

2) – fully accord with those of *Phoma labilis*, a saprophytic species of the section *Phoma*, which has been previously recorded in southern Eurasia on dead stems of *Lavatera* spp. Diagnostic data on its characteristics in vitro can be found in Contribution I–2 no. 19 (de Gruyter, Noordeloos & Boerema, 1993).

4. **Plenodomus cannabis** (Allescher) Moesz & Smarods
[Also erroneously distributed as 'Moesz & Smarods n. spec.']

Plenodomus cannabis (Allescher) Moesz & Smarods in Moesz, Bot. Közl. 38 (1941) 70. — *Phoma herbarum* f. *cannabis* Allescher, Rabenh. KryptogFlora, Pilze 6 (1899 [vol. dated '1901']) 330.

Material examined. Type collection of *Phoma herbarum* f. *cannabis* on stem pieces of hemp, *Cannabis sativa* (Cannabaceae), near Altenmarkt, Oberbayern, Germany, 21 Aug. 1882 (Herb. Allescher, M); specimens labelled *Plenodomus cannabis*, on stems of *Cannabis sativa*, distr. Riga, prov. Vidzeme, Latvia (Letland): coll. J. Smarods, 23 March 1939 (Herb. Smarods, W) and coll. J. Smarods, May 1939, distributed as Smarods, Fungi latvici exs. No. 985 (W) and as Petrak, Mycoth. gen. No. 1870 (W; erroneously as 'Moesz & Smarods n. spec.').

IDENTIFICATION

= ***Phoma exigua*** Desm. var. *exigua*, Annls Sci. nat. (Bot.) III, 11 (1849) 282–283, type species of *Phoma* sect. *Phyllostictoides*.

Boerema (1970) established that the type collection of *P. herbarum* f. *cannabis* fully agreed with *Phoma exigua* on Dutch material of *Cannabis sativa* (proved by isolation of fungus in pure culture). This ubiquitous plurivorous species produces 'common' pseudoparenchymatous pycnidia with very variable conidia, mostly 5.5–10 × 2.5–3.5 µm, the larger ones often becoming 1- or even 2-septate (characteristic for sect. *Phyllostictoides*,

see Van der Aa et al., 1990). For additional diagnostic data on characteristics in vitro see Boerema & Höweler (1967).

The specimens collected by Smarods near Riga in 1939 also contain a species of *Phoma* with pseudoparenchymatous pycnidia, but with notably smaller conidia, mostly 4–5.5 × 1.5–2(–2.5) µm, similar to those of *Phoma herbarum* Westend. (see no. 43, '*Leptophoma urticae*'). However, the conidial dimensions given by Moesz (l.c.) accord with those of *P. exigua* given by Allescher (l.c.).

5. '**Plenodomus cardaminis** Rupprecht'

'*Plenodomus cardaminis* n. sp. det. Rupprecht' in herb. B [manuscript name].

Material examined. Three samples of a collection on stem pieces of *Cardamine impatiens* (Cruciferae), near Oberdresselendorf, Westfalen, Germany: coll. A. Ludwig, 11 Oct. 1925 (Herb. Ludwig, B).

IDENTIFICATION

= ***Phoma versabilis***, *spec. nov.* — Fig. 3

Pycnidia plerumque 240–320 µm diam., globosa, depressa, fusca, immersa, sero poro nec ostiolo aperientia, primum massam cellularum compactarum ('pycnosclerotia') continentia quae deinde in cavitatem cellulis conidiogenis phialidicis vestitam doliiformibus vel ampulliformibus, plerumque 5(–7) × 4–5 µm, dissolvitur. Conidia non-guttulata, ovoidea-ellipsoidea, magnitudine variabilia, in typo plerumque 5–7 × 2–2.5 µm. Cellulae peripericae et basales pycnidiorum fuscae, centrales hyalinae, iodio addito rubescentes. — Holotypus L 995.229-369, ex herbario Ludwig in B.

The characteristics of this species are typical of some species of *Phoma* sect. *Sclerophomella* (type *P. complanata*, see no. 11) with a *Didymella* teleomorph: stromatic pycnidial primordia ('pycnosclerotia', often indistinguishable from immature ascocarps), which lyse gradually into poroid pycnidia. The contents of the initial central cells (at first compact, later loose) stain red with JKJ. This also occurs with the hyaline wall cells of mature pycnidia (a common phenomenon in sect. *Sclerophomella*). The specimens on dead stems of *Cardamine impatiens* collected in Westfalen fully agree with specimens on

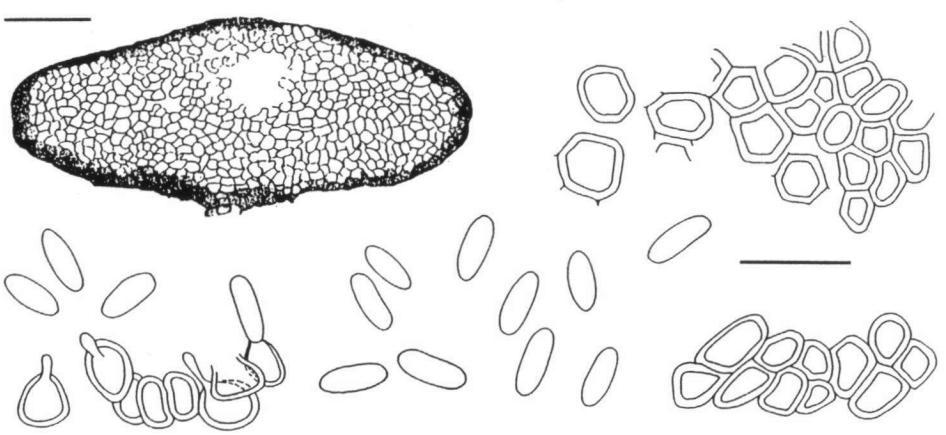

Fig. 3. *Phoma versabilis*. Pycnidia initially containing a compact mass of cells ('pycnosclerotia') which afterwards becomes loose and finally result in a pycnidial cavity lined with doliiform conidiogenous cells. Bar pycnidium 50 µm. Bar cells and conidia 10 µm.

a *Silene* species collected in Wageningen, the Netherlands. This is apparently a species occurring on different plants in Europe ('*versabilis*' = mobile). The immersed globose-depressed pycnidial primordia and pycnidia are mostly 240–320 µm diam., with a dark periphery. Conidiogenous cells doliiform or ampulliform, mostly 5(–7) × 4–5 µm. Conidia eguttulate, ovoid-ellipsoidal, variable in size, in the type specimen mostly 5–7 × 2–2.5 µm, in the specimens on *Silene* mostly 5.5–7 × 2.5–3 µm. The species has much in common with *Phoma sylvatica* Sacc. on *Melampyrum* spp. (see no. 40), which, however, produces significantly smaller conidia.

6. **Plenodomus cenangium** (Corda) Oud.

Plenodomus cenangium (Corda) Oudemans, Enum. Syst. Fung. 4 (1923) 477. — *Sphaeria cenangium* Corda, Icon. Fung. 4 (1840) 43.

Material examined. Type of basionym on leaf of olive, *Olea europaea* (Oleaceae), Italy (Herb. Corda, PR-M 155638; permanent slide: CBS-v.d. Aa 11958). [The leaf with this type specimen has been figured by Corda, see Fig. 4.]

IDENTIFICATION

≡ ***Cytosporella cenangium*** (Corda), *comb. nov.*

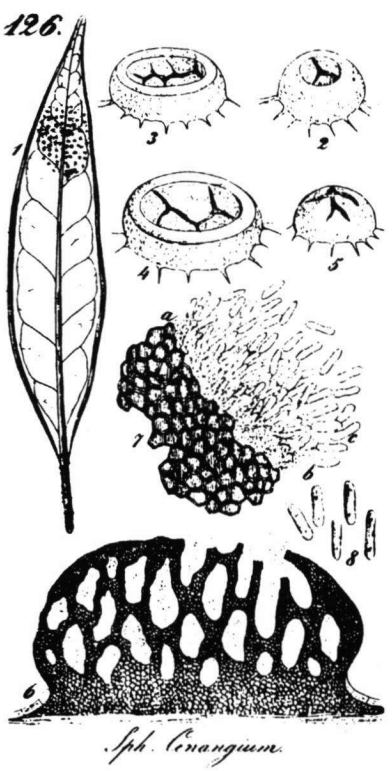

Fig. 4. *Cytosporella cenangium.* Reproduction of original illustration of *Sphaeria cenangium* in Corda (1840: Tab. 9, fig. 126).

The characteristics of this fungus are clearly illustrated by Corda, l.c. (reproduced in Fig. 4). He noted that the fungus could be symptomless on petioles and young twigs, but on leaves conidiomata were hypophyllous within pallid spots. They fit well with thoseof the genus *Cytosporella* Sacc. cf. the illustrated type study by Sutton (1980: fig. 339). Conidiomata stromatic, semi-globose with a broad base, 600–1000 µm diam., consisting of thin-walled pale brown cells, darker at the periphery; multiloculate, i.e. 15–20 locules at varying levels, ostioles absent, dehiscence by irregular fissures. Conidiophores arising from the inner cells of the locules, short cylindrical, occasionally septate, with acropleurogenous conidia. Conidia cylindrical, often somewhat curved, mostly (4–)5(–5.5) × 1.5 µm, eguttulate or with 1–2 small polar guttules.

Finally it should be noted that olive leaves can support some *Cytospora*-like anamorphs reminiscent of *Cytosporella cenangium*, such as the well-known foliicolous Ascomycete *Propolis panizzei* (de Not.) Sherwood (1977; = *Stictis panizzei* de Not.), see Petri (1905).

7. **Plenodomus chelidonii** Naumov

Plenodomus chelidonii Naumov, Mater. Fitopat. Ross. 5 (1926) 12.

Material examined. Culture of type specimen from dead stems of *Chelidonium majus* (Papaveraceae), Detskoje (formerly Tsarskoje), Selo, Russia, 24 Sept. 1915; leg. N.A. Naumov (CBS 115.16).

IDENTIFICATION

= ***Phomopsis*** sp.

The description as well as the cultural characters of this fungus clearly point to a species of *Phomopsis* (Sacc.) Sacc. with only α-conidia. The placement in *Plenodomus* was probably based on the paper by Von Höhnel (1909) in which *Plenodomus* Preuss was treated as an older synonym of *Phomopsis* (recanted by Von Höhnel, 1918). The fungus was characterized by indistinct ostiolate conidiomata, 300–500 µm diam. and 300 µm high, with relatively long conidiophores, 22–30 µm; dimensions of α-conidia 5.5–7.2 × 2.7 µm. The characteristics of conidiophores and conidia are reminiscent of *Phomopsis morphaea* (Sacc.) Grove, Bull. misc. Inf. R. bot. Gdns Kew 2 (1917) 70, originally described on stems of *Papaveris orientale* in Italy. The latter, however, should produce very small conidiomata, c. 150 µm diam. For a discussion on the species concept in the genus *Phomopsis* see Sutton (1980) and Van der Aa, Noordeloos & de Gruyter (1990).

8. **Plenodomus chenopodii** (P. Karsten & Hariot) v. Arx

Plenodomus chenopodii (P. Karsten & Hariot) von Arx, Verh. Kon. ned. Akad. Wet. [Afd. Natuurk.] reeks 2, 51, 3 [= Revision Gloeosporium ed. 1] (1957) 73. — *Gloeosporium chenopodii* P. Karsten & Hariot, J. Bot., Paris 3 (1889) 209.

Material examined. Type of basionym on stem pieces of *Chenopodium album* (Chenopodiaceae), Clermont-Ferrand, Auvergne, France, Oct. 1888 (PC).

IDENTIFICATION

≡ ***Phoma chenopodiicola*** de Gruyter et al., Persoonia 15 (3) (1993) 395–396 [Contribution I–2 no. 23]; not *Phoma chenopodii* Ahmad, Sydowia 2 (1948) 79.

A common necrophyte on *Chenopodium album*. The thin-walled pycnidia, mostly 200–250 µm diam., are often deeply immersed, which may explain the original classification in *Gloeosporium*. Conidia in vivo usually broad-ellipsoidal, mostly 5.5–7 × 2.5–3 µm; in vitro their shape and size are more variable, common dimensions 4–7(–10) × 1.5–2.5(–4.0) µm. In both cases the conidia always remain one-celled (sect. *Phoma*). The diagnostic data in Contribution I–2 no. 23 (de Gruyter, Noordeloos & Boerema, 1993) refer to the characteristics in vitro.

Von Arx's interpretation of this fungus as *Plenodomus* was recanted in the second edition of 'Revision Gloeosporium' (von Arx, 1970). There the species has been listed as conspecific with the plurivorous *Phoma exigua* Desm. var. *exigua*, which also frequently in Europe occurs on *Chenopodium album* (see e.g. Boerema & Howeler, 1967). The latter may produce similar continuous conidia, but usually also 1- or even 2-septate conidia occur (sect. *Phyllostictoides*); compare the note under *Plenodomus cannabis* (no. 4).

9. '**Deuterophoma** vascular pathogen' of **Chrysanthemum** spp.

Deuterophoma isolates from stunted or wilting plants, reported by Baker, Davis & Kimball, Pl. Dis Reptr 33 (1949) 2–8, Taylor, Aust. J. exp. Agric. Anim. Husb. 2 (1962) 90–91 and Robertson, Pl Path. 16 (1967) 31–36.

Material examined. Culture from dark coloured vascular bundles in flower stems of *Chrysanthemum coccineum* (Compositae), Chatteris, Cambridgeshire, England, 1962 (IMI 12871; isolate studied by Robertson, 1967).

IDENTIFICATION

= ***Phoma vasinfecta*** Boerema et al., Persoonia 15 (4) (1994) 485; synanamorph *Phialophora* sp.

The initial classification of this fungus as *Deuterophoma*, infecting the vascular system in *Chrysanthemum* spp. (Slow Wilt, Decline Disease), rested on the production of '*Cephalosporium*-like' hyphal conidia (= *Phialophora* synanamorph), a feature of *Phoma tracheiphila* (Petri) Kant. & Gik. (Contribution III–1 no. 21), the type species of Petri's genus *Deuterophoma*. Both fungi have about the same dimensions of pycnidia, pycnidial conidia and hyphal conidia. *Phoma tracheiphila* is also a vascular pathogen, the causal organism of wilt and dieback of lemons and other *Citrus* spp. (Mal Secco Disease). Due to the similarities, Baker et al. (1985) proposed *P. tracheiphila* f. sp. *chrysanthemi* for the chrysanthemum pathogen. However, apart from the quite different hosts and improbability of common origin, there are essential morphological differences. The most important argument for differentiating the chrysanthemum pathogen at species level has been the absence of scleroplectenchyma (Boerema et al., 1994). Furthermore, the pseudoparenchymatous pycnidia of *Phoma vasinfecta*, (55–)75–100(–160) µm diam., have only slightly elongated necks (neck at the most 40 µm, whilst in *P. tracheiphila* it is up to 250 µm long); conidia mostly (2–)2.5–3(–4) × 1–1.5 µm. The *Phialophora* synanamorph of *P. vasinfecta* is indistinguishable from *Phialophora chrysanthemi* (Zachos et al.) W. Gams, with variable conidia, mostly 2.5–5 × 1–2(–2.5) µm.

10. **Plenodomus cocogenus** Saw.

Plenodomus cocogenus Sawada, Spec. Publs Coll. Agric. natn. Taiwan Univ. 8 (1959) 145 [as '*cocogena*', nom. inval. Art. 36].

Material examined. Type on leaves of *Cocos nucifera* (Cocoineae), Hengchun, Pref. Pingtung, Taiwan: coll. T. Kusumoto, 15 March 1941 (TNS = NSM).

IDENTIFICATION

= ***Asteromella cocogena**, spec. nov.*

Diagnosis traducta e Sawada (1959: 145): Pycnidia hypophylla, gregaria, dispersa, subepidermalia, deinde erumpentia, conica, deinde globosa, 52–100 µm diam., plus minusve stromate circumdata, paries et stromata fusca, pseudoparenchymatosa; ostiola 11–13 µm diam.; conidia cylindrica, continua, hyalina, 4–4.5 × 1 µm. In laesionibus ovalibus, flavo-brunneis ad griseo-albidis, modice depressis, margine brunneo et modice elevato circumdatis, 1.5–13 × 1.3–8 µm, ad folia *Cocois nuciferae*. – Holotypus TNS-F 2207789.

A typical species of *Asteromella*: small, more or less stromatic pycnidia, 50–100 µm diam., hypophyllous in yellow-brown to greyish white lesions. Conidia small, usually 3–4(–4.5) × 1 µm, arising from short septate conidiophores, apically and laterally just below the septa. The somewhat stromatic structure of the pycnidia was apparently the reason why Sawada has classified it in *Plenodomus*. It was published after 1 January 1935 without a Latin diagnosis (Art. 36.1). This is supplied above.

Asteromella cocogena resembles *A. cocoes* Batista & Bezerra (1965) described from similar lesions on leaves of *Cocos nucifera* in Brazil (holotype UFP = IMUR), but the

pycnidia of the latter are always epiphyllous. *Asteromella cocogena* and *A. cocoes* may represent the microconidial or spermogonial stages of two different species of *Mycosphaerella*.

11. 'Plenodomus complanatus (Tode: Fr.) Rupprecht'

'*Plenodomus complanatus* (Tode) Rupprecht', comb. nov. in herb. B [manuscript name]. — *Sphaeria complanata* Tode, Fungi mecklenb. Sel. 2 (1791) 22: Fries, Syst. mycol. 2 [Sect. 2] (1823) 508. — *Phoma complanata* (Tode: Fr.) Desmazières, Annls Sci. nat. (Bot.) III, 16 (1851) 299–300. — *Sclerophomella complanata* (Tode: Fr.) Höhnel, Hedwigia 59 (1918) 238.

Material examined. Plenodomus complanata 'teste Rupprecht' on stem pieces of *Heracleum sphondylium* (Umbelliferae) near Rhode, Kreis Olpe, Westfalen, Germany: coll. A. Ludwig, 29 April 1921 (= Sydow, Mycoth. germ. No. 2179 sub *Sclerophomella complanata* (Desm.) Höhnel) in Herb. Ludwig (B). Various other specimens on Umbelliferae in Herb. Ludwig (B) with the annotation '*Plenodomus* teste Rupprecht', but originally labelled *Sclerophomella complanata*, e.g. collections by K. Starcs, Latvia (Letland) on *Angelica sylvestris*, distr. Riga, prov. Vidzeme, 27 June 1936 and 5 June 1938, collections by A. Ludwig, Flora von Hessen-Nassau, Germany, on *Conium maculatum*, Dillkreis, 10 May 1924, and Flora von Westfalen, Germany on *Aegopodium podagraria*, Kreis Siegen, 3 May 1947, on *Anthriscus sylvestris*, Kreis Siegen, 21 April 1934 and 30 Dec. 1947, and on *Chaerophyllum hirsutum*, Kreis Siegen, 15 July 1921.

IDENTIFICATION

≡ ***Phoma complanata*** (Tode: Fr.) Desm., l.c., type species of '*Phoma* sect. *Sclerophomella*'.

A very common fungus on old stems of wild Umbelliferae in temperate Eurasia and North America. Its thick-walled ('sclerotic') pycnidia, up to 400 µm diam., closely resemble pycnidial Type-II of sect. *Plenodomus*, but scleroplectenchyma is always wanting [cell-wall JKJ–; cell-contents may become red]. In vivo, the pycnidia usually contain only aseptate ellipsoidal conidia, 5–9 × 2–3.5 µm, but sometimes a high percentage of the conidia become larger and 1-septate, often 10–15(–16) × 2.5–3.5(–4) µm [see no. 37, '*Diploplenodomus rivini*']. For the characteristics in vitro see Boerema (1976). Old pycnidia on previous year's stems occasionally contain extremely large *ascochytoid* conidia, 20–34 × 6–10 µm. The conidial mass is initially buff to flesh coloured, but darkens with age to brown or black; the conidia then mostly appear septate, swollen and dark.

12. Plenodomus corni Batista & Vital

Plenodomus corni Batista & Vital, Anais Soc. Biol. Pernamb. 15 (1957) 420. — *Phoma riggenbachii* Boerema & Janse in Janse, Eur. J. For. Path. 11 (1981) 428–429 [as nom. nov. to avoid homonymy with *Phoma corni* Fuckel ex Saccardo, Michelia 2 (1) (1880) 94 = *Phomopsis corni* (Fuckel ex Sacc.) Traverso, Fl. ital. crypt. 2 (1906) 268].

['*Plenodomus rabenhorstii*' sensu Riggenbach, Phytopath. Z. 27 (1956) 1–40.]

Material examined. Type collection on branches of *Cornus sanguinea* (Cornaceae), Hungary (Magyarhon Virányából = Hungarian Flora): coll. F. Hazslinszky, Oct. 1885 (S). Representative culture of *Phoma riggenbachii*, studied by Janse (1981) and obtained from bacterial knot of ash, *Fraxinus excelsior* (Oleaceae), Scheerwolde, Overijssel, the Netherlands, April 1978 (CBS 248.79). Another isolate from bacterial knot of ash, Wageningen, Gelderland, the Netherlands, 1980 (PD 80/212).

IDENTIFICATION

≡ ***Pyrenochaeta corni*** (Batista & Vital), *comb. nov.*

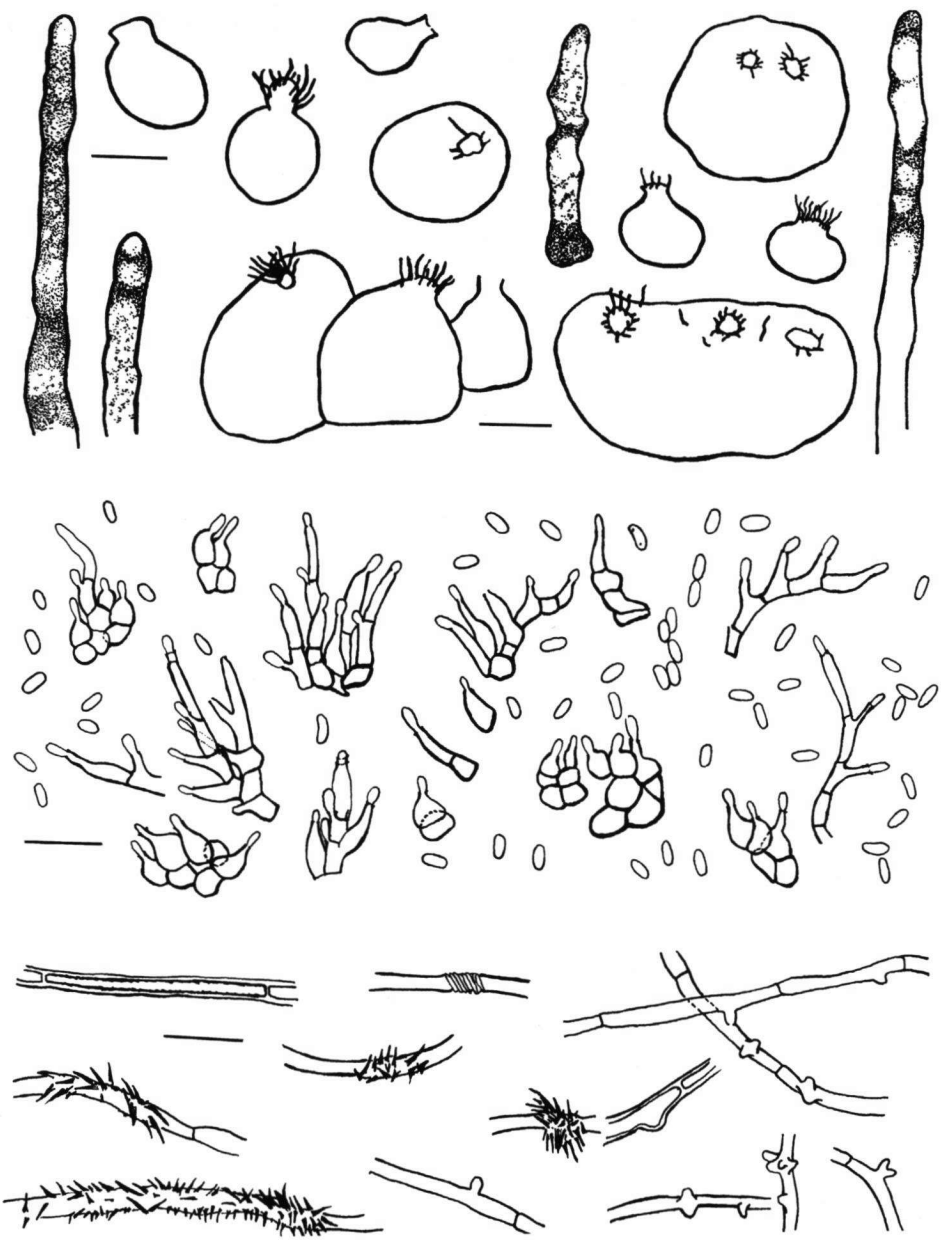

Fig. 5. *Pyrenochaeta corni.* Characteristics in vitro on OA; isolate from bacterial knot of ash, see Janse, 1981: 428–429 sub *Phoma riggenbachii.* At maturity the initially closed and glabrous scleroplectenchymatous pycnidia (*Plenodomus*-like) become setose around the pore. The elongated ampulliform conidiogenous cells gradually develop into filiform septate conidiophores, producing small conidia apically and just below the transverse septa. Characteristic short tuberances and 'splinter'-crystals, emanate from the aerial hyphae. The crystals apparently start forming in bands beneath the cell wall. Bar pycnidia 100 µm. Bar setae, hyphae, conidia and conidiogenous cells 10 µm.

This appears to be a lignivorous necrophyte already distributed in 1884 by Roumeguère as '*Phoma enteroleuca* Sacc. f. *fraxini*', see Boerema & Loerakker (1985: 295–296). The fungus is often found in Europe in association with bacterial knot (canker) of ash (Riggenbach, l.c.; Janse, l.c.). On account of its scleroplectenchymatous wall structure it was reclassified in *Phoma* sect. *Plenodomus* (as *Phoma riggenbachii*). However, further studies on isolates from ash revealed typical characteristics of the genus *Pyrenochaeta* de Not. emend. Schneider (1979), see Fig. 5. At maturity, the initially closed and glabrous pycnidia become setose around the porus. The elongated ampulliform conidiogenous cells gradually develop into filiform and branched septate conidiophores, producing small conidia (mostly 2.5–3 × 1–1.5 µm) apically and just below the transverse septa. Production of short protuberances and 'splinter'-crystals are specific features of the aerial mycelium in vitro.

Within the genus *Pyrenochaeta* one species with an obviously scleroplectenchymatous wall structure is already known, viz. *Pyrenochaeta fallax* Bres., see the discussion under *Leptophoma urticae* (Schulzer & Sacc.) Höhnel (no. 43). Thus within *Pyrenochaeta* one may also differentiate a separate section resembling sect. *Plenodomus* in *Phoma* ('*Plenodomopsis*').

13. **Plenodomus cruentus** Sydow

Plenodomus cruentus H. Sydow & P. Sydow, Annls mycol. 34 (1936) 395.

Material examined. Syntypes on stem pieces of *Thalictrum flavum* (Ranunculaceae), Tamsel, Brandenburg, Germany, distributed as Sydow, Mycoth. germ. No. 2935 (1936) sub 'Nebenfruchtform *Leptosphaeria cruenta* Sacc.': coll. P. Vogel, 6 July 1929, 29 May 1932, 17 May 1934 (Herb. Ludwig, B; UPS); specimens on stem pieces of *Thalictrum* sp., Mt Bisamberg near Vienna, Niederdonau, Austria, distributed as Petrak, Mycoth. gen. No. 1865: coll. F. Petrak, May 1940 (W); specimens on stem pieces of *Thalictrum* sp., Mt Hundsheimer Kogel near Hainburg, Niederdonau, Austria, distributed as Petrak, Mycoth. gen. No. 1939: coll. F. Petrak, May 1940 (W).

IDENTIFICATION

≡ ***Phoma cruenta*** (Sydow), *comb. nov.*

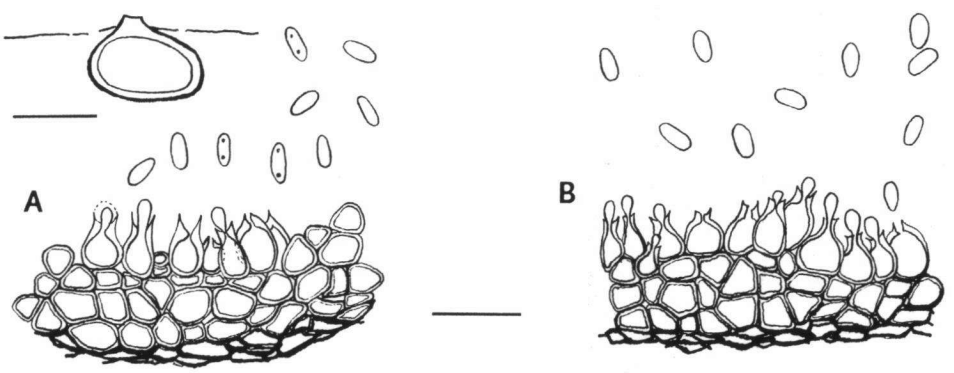

Fig. 6. *Phoma cruenta.* The wall of the small immersed pycnidia consists of several layers of small thin-walled cells. Conidiogenous cells relatively large, globose, with a conspicuous collarette. Drawings from A. syntype of the basionym *Plenodomus cruentus* on *Thalictrum flavum* (UPS), B. Mycoth. gen. No. 1865 (W) on *Thalictrum* spec. Bar pycnidium 100 µm. Bar cells and conidia 10 µm.

The small pycnidia of this species, mostly c. 200 µm diam., occur in reddened patches on the host; they have relatively thick walls, composed of rather small thin-walled cells (non-scleroplectenchymatous). The slightly papillate ostiole sometimes has a reddish pigment. The conidiogenous cells (Fig. 6) have conspicuous collarettes; conidia (3–)3.5–4.5 (–5) × 1–2 µm, often biguttulate. The pycnidia have been recorded in association with immature pseudothecia of *Leptosphaeria cruenta* Sacc., but a single identity is not yet proved by culture studies. *Leptosphaeria cruenta* is obviously close to *L. haematites* (Rob. ex Desm.) Niessl, frequently found in red coloured areas on stems of *Clematis vitalba*, see no. 20 under *Plenodomus haematites*. Another closely allied species, occurring in reddened patches on various hosts is *L. purpurea* Rehm, anamorph *Phoma sanguinolenta* Grove, treated in the 'Addendum' of Contribution III–1. The latter fungi show scleroplectenchymatous ascocarp wall structure but their pycnidia are always pseudoparenchymatous.

14. **Plenodomus destruens** Harter

Plenodomus destruens Harter, Phytopathology 3 (1913) 245.

Material examined. Type on stem pieces of sweet potato, *Ipomoea batatas* (Convolvulaceae), Portsmouth, Virginia, USA, 15 Aug. 1912 (BPI); an original culture of the fungus made by Harter (CBS 129.21); similar culture from decayed wood of *Ipomoea batatas*, 1966 (CBS 253.66).

IDENTIFICATION

≡ ***Phomopsis destruens*** (Harter), *comb. nov.*

The type collection, cultures and the original description of this well-known pathogen of sweet potatoes (Foot Rot) obviously refer to a species of *Phomopsis* characterized by biguttulate ellipsoidal α-conidia, mostly 7–10 × 3.5–4 µm, borne on filiform conidiophores, and often mixed with oblong-fusoid 'γ'-conidia without guttules (compare Das Gupta, 1930, figs. 5–7). Harter (l.c.) already noted that the fungus "does not fit exactly the description of *Plenodomus*" and that it "has some characteristics of *Phomopsis*". But in his opinion it differed from *Phomopsis* by wall structure, "two instead of four walls", "dark outer wall which is conspicuous at the top and base of the pycnidia", and "in having no chambering of the pycnidium" and "in not being stromatic". In *Phomopsis*, however, the thickness and darkness of the wall and the presence of stromatic tissue is highly variable depending on factors such as the structure of the host tissue. Furthermore the pycnidia of *Phomopsis* are not always multilocular, the internal cavity usually being only partly divided by protrusions of the proliferous layer; this was also the case with the type specimen of *Plenodomus destruens* (see also Harter, l.c.: fig. 1b). The diversity and variation found amongst *Phomopsis* species is well defined by Sutton (1980).

15. **Plenodomus erythrinae** Oud.

Plenodomus erythrinae Oudemans, Versl. gew. Verg. Afd. Natuurk. Kon. Ned. Akad. Wet. 5 (1897) 229–231.

Material examined. Type on stems of dadap, *Erythrina javanica* (Leguminosae), Java, Indonesia, Nov. 1896 (Herb. Oudemans, L).

IDENTIFICATION

≡ ***Lasiodiplodia theobromae*** (Pat.) Griffon & Maubl., Bull. trimest. Soc. mycol. Fr. 25 (1909) 57.

The type collection contains large aggregates of stromatic ostiolate pycnidia, up to 3 mm diam., with relatively large, thick-walled subovoid hyaline conidia, 25–30 × 15 µm [these dimensions are somewhat larger than those reported in the original account (19–23 × 10–11 µm)], borne on cylindrical to somewhat obpyriform conidiogenous cells. The pycnidia are clearly a young (immature) stage of *Lasiodiplodia theobromae*, a common plurivorous fungus in tropical and subtropical regions, popularly known as *Botryodiplodia theobromae* Pat. Mature conidia of this anamorph are 1-septate, cinnamon to dark brown, and longitudinally striate. The teleomorph is known as *Physalospora rhodina* Berk. (Sutton, 1980) or *Botryosphaeria rhodina* (Berk. & Curt.) von Arx (1970). The fungus causes, or is associated with, many diseases (see Punithalingam, 1976); in Java it is repeatedly found in association with a dieback of *Erythrina* (see e.g. Steinmann, 1928).

16. **Plenodomus eucalypti** Alm. & Com.

Plenodomus eucalypti d'Almeida & de Sousa da Camara, Revta agron., Lisb. 5 (1907) 339–340 [Contr. MycoFl. Lusit. 4, no. 96].

Original material "on branches of *Eucalyptus globulus* (Myrtaceae) near Caldas da Reinha, Portugal: coll. A. Moller, Aug. 1904" apparently not preserved cf. inf. Dr. M.E.P. Costa (1982), Lab. Pat. veg. 'Verissimo de Almeida' (LISVA). [The planned figures of the species 'Tab. 1 fig. 9–10' were also lost and not published; inf. Dr. M.T. Lucas (1982) (LISE).]

IDENTIFICATION

= ***Phomopsis allescheriana*** (P. Henn.), *comb. nov.*; basionym. *Phoma allescheriana* P. Hennings, Verh. bot. Ver. Prov. Brandenb. 40 (1898) 166; holotype on branches *Eucalyptus resinifera*, April 1894 (B).

The description of *Plenodomus eucalypti* matches very well with the characteristics of the above *Phoma allescheriana*, found on dead branches of various species of *Eucalyptus* in the Berlin botanical garden. This species is described in detail by Diedicke (1912b), who referred it to the genus *Sclerotiopsis* Speg. (synonym of *Pilidium* Kunze, cf. Sutton, 1980). In our opinion it concerns a typical host-restricted species of *Phomopsis* (Sacc.) Sacc., producing only α-conidia: Pycnidia initially immersed, then erumpent, subglobose with flattened base, 200–350 µm diam., thick-walled and stromatic ('sclerotioid tissue'), multilocular and without a distinct ostiole. Conidiophores filiform, but usually disappearing at maturity. Conidia fusiform, biguttulate, 5–6(–8) × (2–)2.5(–3) µm [α-conidia].

[*Phomopsis eucalypti* Zerova, Bot. Zh. 1 (1940) 307, in Kiev, Ukraine (former USSR), recorded on twigs of *Eucalyptus* sp. in a greenhouse, produces larger α-conidia, 7–9 (–12) × 2–2.5 µm and in addition β-conidia, 20–25 × 1.5–2 µm.]

17. **Plenodomus filarszkyanus** (Moesz) Petrak

Plenodomus filarszkyanus (Moesz) Petrak, Annls mycol. 23 (1925) [54–]55.— *Sphaeronaema* filarszkyanum Moesz, Bot. Közl. 14 (1915) 151[–152] [as '*Sphaeronema filarszkyana*'].

Original material of the basionym" on dried stems of *Luzula spadicea* (Juncaceae), in the Kistarpatak valley in the mountain-range Vysoké Tatry, Slovakia (former Czechoslovakia): coll. F. Filarszky & G. Moesz, 15 June 1909" could not be traced and was probably destroyed in the Second World War cf. inf. Dr. J. Gönczöl, BP (1978); it was studied by Petrak (1925a).

IDENTIFICATION

≡ ***Phoma filarszkyana*** (Moesz), *comb. nov.*

The descriptions of this species by Moesz (l.c.) and Petrak (l.c.) clearly point to a species of *Phoma*, distinguished by nearly globular conidia, mostly 2.5–3 µm diam.; but the descriptions do not give any indication of the presence of scleroplectenchyma. Petrak's concept of *Plenodomus* was mainly based on the general appearance of the pycnidia, 'pleurogenous' origin of the conidia and a connection with the ascomycetous genus *Leptosphaeria*. *Phoma filarszkyana* may indeed be connected with a species of *Leptosphaeria* sensu lato, because it agrees with the anamorph of *L. typhicola* P. Karsten, cf. the cultural study by Lucas & Webster (1967). That Ascomycete is known as a very variable plurivorous fungus [cf. Leuchtmann (1984) as *Massariosphaeria typhicola* (P. Karsten) Leuchtm. and Barr (1989) as *Chaetomastia typhicola* (P. Karsten) Barr], recorded on various monocotyledons, esp. marsh plants belonging to the Cyperaceae, Gramineae, Juncaceae and Typhaceae. However, some of the records probably refer to another species, because isolates made by Leuchtmann developed a different anamorph with much larger conidia. The pycnidia of *P. filarszkyana* in vivo were subglobose-ellipsoidal with flattened base and a gradually developing ostiolate neck, variable in size, 100–900 µm diam., wall 40–50 µm, neck mostly 130–150 µm long. The pycnidia obtained by Lucas & Webster in vitro were subglobose and non-ostiolate, 320–400 µm diam., wall 32–48 µm. Conidia 3–4 × 2.5–3 µm.

18. **Plenodomus fusco-maculans** (Sacc.) Coons

Plenodomus fusco-maculans (Sacc.) Coons, J. agric. Res. 5 (1916) 714; Rep. Mich. Acad. Sci. 17 (1916) 122. — *Phoma fusco-maculans* Saccardo, Michelia 2 (2) (1881) 275. — *Aposphaeria fusco-maculans* (Sacc.) Saccardo, Sylloge Fung. 3 (1884) 174.

Material examined. Type of basionym on decorticated wood of apple, *Malus pumila* (Rosaceae), Selva, North Italy, Oct. 1880 (PAD).

IDENTIFICATION

= ***Aposphaeria pulviscula*** (Sacc.) Saccardo, Michelia 1 (2) (1878) 259; type species of the genus *Aposphaeria* Sacc.

Coons (l.c.) erroneously adopted Saccardo's *Aposphaeria fusco-maculans* for a typical species of *Phoma* sect. *Plenodomus* found in Michigan, USA, in association with a superficial bark canker of apple: *Phoma coonsii* Boerema & Loerakker, see Contribution III–1 no. 22. The characteristics of Saccardo's *Aposphaeria fusco-maculans*, described from decorticated wood of apple in Italy, agree with those of the earlier described *Aposphaeria pulviscula* (compare Sutton, 1980). Superficial subglobose pycnidia with inconspicuous central ostiole; wall composed of an outer layer of brown thick-walled cells and an inner layer of smaller hyaline cells with undifferentiated conidiogenous cells together with cylindrical 1–3-septate conidiophores. Conidia 3–4.5 × 1.5 µm, arising apically or just below the septa. *Aposphaeria fusco-maculans* is also recorded on decorticated wood of mountain ash, *Sorbus aucuparia* (Bresadola & Saccardo, 1897). The original material of *A. pulviscula* (PAD) refers to bare wood of willow, *Salix* sp. and wood of an indeterminate species. Thus it may be a common lignivorous fungus in southern Europe. The pycnidial dimensions varied mostly between 80–200 µm on the various substrata. Some species of *Aposphaeria* are metagenetically related to members of the Ascomycete genus *Melanomma* (Nitschke) Fuckel; this is also suggested for *A. pulviscula*, but not confirmed in cultural experiments, see Sutton (1980).

19. **Plenodomus gallarum** (Oud.) Oud.

Plenodomus gallarum (Oud.) Oudemans, Ned. kruidk. Archf II, 4, 3 (1885) 229–230; Versl. gew. Verg. wis- en natuurk. Afd. Kon. ned. Akad. Wet. Amst. 5 (1897) 229–230. — *Dothiora gallarum* Oudemans, Versl. Meded. Kon. Akad. Wet. [Afd. Natuurk.] reeks 2, 18 (1883) 371–372.

Original material "on hypophyllous galls on fallen leaves of *Quercus robur* (Fagaceae), near Wageningen, the Netherlands: coll. M.W. Beyerinck" apparently not preserved (not in herb. Oudemans, L).

IDENTIFICATION

= ***Cleistophoma dryina*** (Berk. & Curt.) Petrak & H. Sydow, Beih. Repert. Spec. nov. Regni veg. 42 [Bogen 1/10; = Gatt. Pyrenomyz. Sphaerops. Melancon. I] (1926) 295–297.

The description of *Plenodomus gallarum* (Oudemans, 1885, 1897) matches well with the characteristics of *Cleistophoma dryina* as described by Petrak & Sydow (l.c.) from branches and branch-galls of *Quercus* spp., collected in the USA. Pycnidia subepidermal, numerous, mostly densely crowded, semi-globose, closed, with a flattened stromatic base, very variable in dimensions, often 200–400 µm diam., but also much larger and often coalescing. The pycnidial cavity has usually a multilocular appearance by the development of a central cellular column or irregular folded outgrowth from the basal stroma. At maturity the upper wall of the pycnidia apparently dehisces or breaks down. Conidia relatively large, broad ellipsoidal, but soon becoming shriveled; they are borne on short cylindrical conidiogenous cells lining the loculus. The two species differ only by conidial size; Oudemans noted 20 × 6–7 µm, whereas those of *C. dryina* should be shorter, mostly 11–14 × 6–8.5 µm. Petrak & Sydow (l.c.) remark that *C. dryina* is probably conspecific with *Cleistophoma suberis* (Prill. & Delacr.) Petrak & H. Sydow, originally described from leaves of *Quercus suber* in the Alpes-maritimes, France; conidia 12.5–18 × 7–10 µm. Thus they should be forms of one species (with *C. dryina* having priority). According to Oudemans (l.c.), *Plenodomus gallarum* fully agreed with the type material of *Tubercularia gallarum* Léveillé, Annls Sci. nat. (Bot.) III, 5 (1846) 273, described from leaf-galls of a *Quercus* species in Bois de Vincennes, Paris, France. However, the original material of *T. gallarum* now also seems to be lost (not in PC).

20. **Plenodomus haematites** Petrak

Plenodomus haematites Petrak, Sydowia 1 (1947) 135–136.

Material examined. Type on stems of *Clematis vitalba* (Ranunculaceae), Mt. Hundsheimer Kogel near Hainburg, Niederdonau, Austria, May 1940 (herb. Petrak, W); specimens studied by Lucas & Webster (1967) and labelled *Leptosphaeria haematites*: pycnidia associated with teleomorph on stems of *Clematis vitalba*, Shambrook, Bedfordshire, England, 6 March 1959, and pycnidia in dried oat meal agar culture produced by a single ascospore isolate of this collection (SHEFF 2367); pycnidia in dried oat meal agar culture produced by a single ascospore isolate of the teleomorph from stems of *Clematis vitalba*, Odell, Bedfordshire, England, 12 Feb. 1959 (SHEFF 2353).

IDENTIFICATION

≡ ***Phoma haematites*** (Petrak), *comb. nov.*

This species represents the anamorph of *Leptosphaeria haematites* (Rob. ex Desm.) Niessl, cf. the cultural studies by Lucas & Webster, l.c. The fungus is associated with red coloured areas on stems of *Clematis vitalba* throughout Europe. Closely allied to *L. haema-*

tites are *L. cruenta* Sacc. on *Thalictrum* spp., discussed under no. 13 as *Plenodomus cruentus*, and *L. purpurea* Rehm, anamorph *Phoma sanguinolenta* Grove, treated in the 'Addendum' of Contribution III–1. These fungi have the following features in common; they occur in reddened patches on the hosts and often have some red pigmentation around their ostioles; their ascocarp wall structure is scleroplectenchymatous, but their pycnidia are pseudoparenchymatous. The pycnidia of *Phoma haematites* are relatively small, 150–250 µm diam., globose with a slightly papillate ostiole; wall consisting of several layers of small thin-walled cells (JKJ–). Conidiogenous cells are globose to bottle-shaped; conidia oblong to ellipsoidal with an inconspicuous guttule at each end, mostly (5–)5.5–7 (–7.5) × 2–2.5(–3) µm [clearly larger than those of *P. cruenta*; see no. 13].

21. **Plenodomus herbarum** Allescher

Plenodomus herbarum Allescher, Ber. bayer. bot. Ges. 5 (1897) 17.

Material examined. Type on decayed, overwintered leaves of lily of the valley, *Convallaria majalis* (Liliaceae), Langheim, near Lichtenfels, Oberfranken, Germany: coll. F. Rohnfelder, April 1896 [Herb. Allescher, M); specimens on decayed leaves of *Convallaria majalis* distributed as '*Plenodomus herbarum*' in Petrak, Mycoth. gen. (1930) No. 295: coll. P. Vogel, Tamsel, Brandenburg, Germany, Feb. 1927 (W).

IDENTIFICATION

≡ ***Phacidiella hiemalis*** (Desm.), *comb. nov.*; basionym *Sporonema hiemalis* Desmazières, Annls Sci. nat. (Bot.) III, 16 (1851) 320; syntype on decayed leaves of *Quercus* sp. (PC, NY).

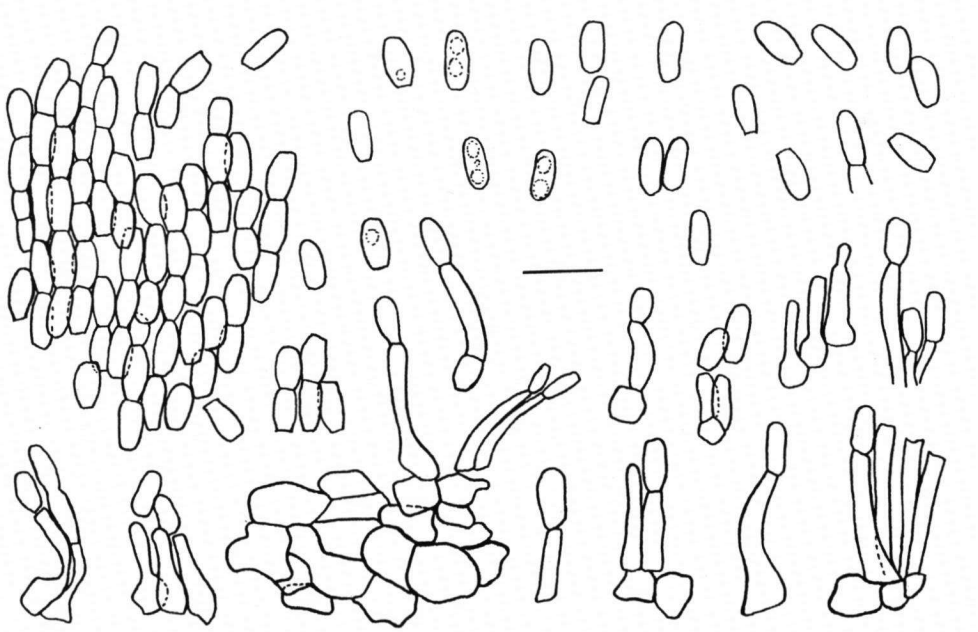

Fig. 7. *Phacidiella hiemalis*. Long chains of barrel-shaped conidia, produced on cylindrical conidiophores. Drawings from holotype of the synonym *Plenodomus herbarum* (herb. Allescher, M). Bar 10 µm.

Plenodomus herbarum appeared to be conspecific with *Sporonema hiemalis*, described from the previous year's semi-decayed leaves of a *Quercus* species in France [cf. Desmazières, Pl. cryptog. France II [ed. 3] No. 81; e.g. in PC and NY, the latter specimen studied and illustrated by Limber, 1955]. It may be significant that lily of the valley is often found under oak trees. The fungus has typical characteristics of the genus *Phacidiella* P. Karsten, compare Sutton (1980). Pycnidia at first globose and closed, later opening and splitting irregularly and becoming cupulate, mostly 150–200 µm diam.; wall rather thin, consisting of brown-black cells. Conidiophores inconspicuous, cylindrical, usually (4–)10(–15) × 1.5 µm, little different from the conidia. Conidia short-cylindrical with truncate ends, mostly (5–)6(–7) × 2–2.5 µm. The conidia adhere in long chains and separate with difficulty, see Fig. 7. It should be noted that this fungus also has been placed in the genera *Schizothyrella* Thumen (Von Höhnel, 1910: 645) and *Sirexcipula* Bubak (Limber, 1955).

22. **Plenodomus hoveniae** Gucevicz

Plenodomus hoveniae Gucevicz, Nov. Sist. niz. Rast. 14 (1977) 78.

Material examined. Type on dry branches of *Hovenia dulcis* (Rhamnaceae), Nikitzki Botanical Garden, Tauria, Russia, 1958 (LECB via IBFI).

IDENTIFICATION

≡ ***Fusicoccum hoveniae*** (Gucevicz), *comb. nov.*

Plenodomus hoveniae looks much like a species of *Phomopsis*, but the conidiogenous cells are not phialidic. It shows close agreement in conidiogenesis and conidial morphology with *Fusicoccum aesculi* Corda sensu Saccardo, the species on which *Fusicoccum* Corda (in Sturm, 1829) probably has been based. See the discussion of that genus and its type species by Sutton (1980). In this context *Fusicoccum* spp. are often anamorphs of *Botryosphaeria* spp.

The fungus (Fig. 8) produces conidiomata which are initially clypeoid-stromatic, but later become completely surrounded by stromatic tissue (JKJ–), mostly 250–600 µm diam., uni- or multilocular. Conidiogenous cells slender filiform, attenuated towards the apex, sparingly septate, usually unbranched, 9–18.5 × 1.5–2 µm, apparently producing only a single apical conidium. Conidia fusiform with truncate base and obtuse apex, with granular contents and often with one or more vacuoles, mostly 6–9 × 2–2.5 µm.

23. **Plenodomus humuli** Kusnetz.

Plenodomus humuli Kuznetzova in Dobrozrakova, Opredelit. bolezni rast. (1956) 323, cf. Negru (Romania) in Mycopath. Mycol. appl. 33 (1967) 368 [as '*humulis*'].

Original description or material not seen (not recorded in Index of Fungi, not traced by IBFI and no information obtained from Romania). Negru (l.c.) refers to a sample on stems of hop, *Humulus lupulus* (Cannabaceae), collected near Sighisoara, distr. Brasov, Romania, 14 Aug. 1963.

IDENTIFICATION (based on Negru's description of Romanian collection)

= ***Phomopsis sarmentella*** (Sacc.) Traverso, Fl. ital. crypt. 2 (1906) 277.

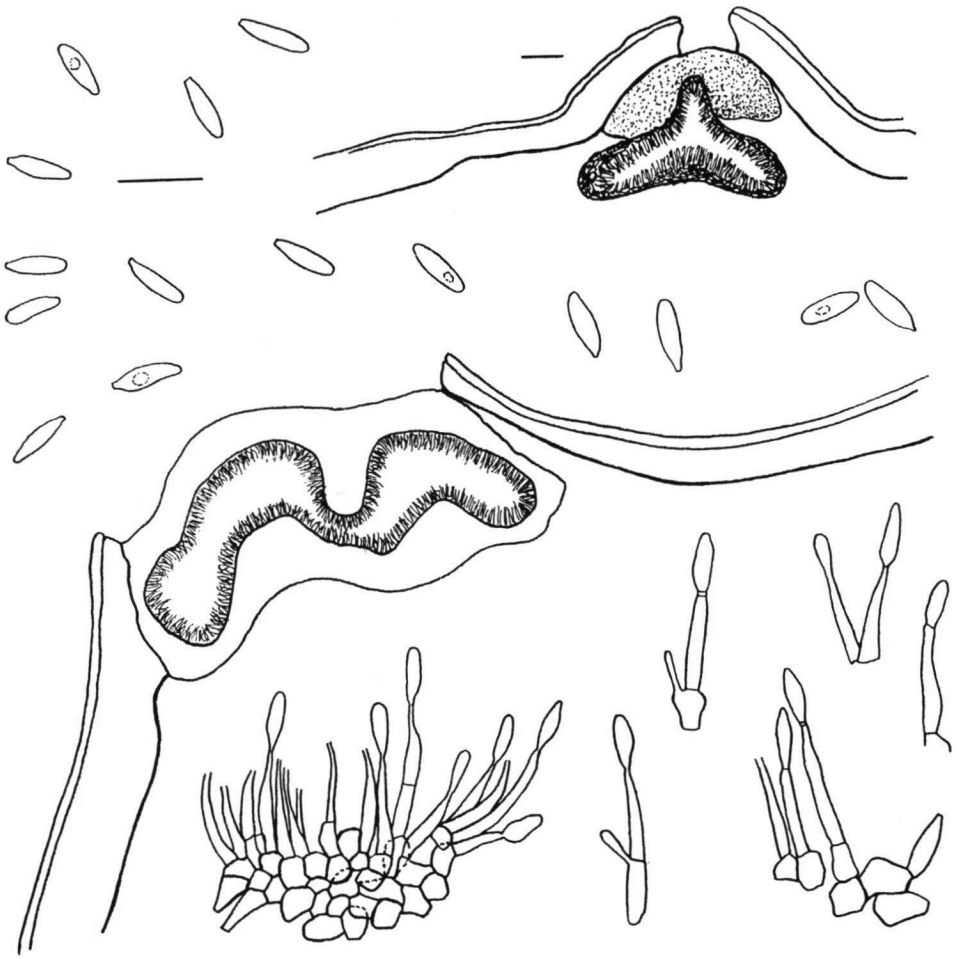

Fig. 8. *Fusicoccum hoveniae*. Stromatic subepidermal pycnidia, initially with only a clypeoid stroma, finally surrounded by stromatic tissue. Filiform conidiogenous cells, producing a single apical conidium. Conidia fusiform with truncate base and obtuse apex. Drawing from holotype of basionym *Plenodomus hoveniae* (LECB). Bar pycnidia 100 µm. Bar conidia/conidiogenous cells 10 µm.

Negru's (l.c.) description of *Plenodomus humuli* agrees with the characteristics of *Phomopsis sarmentella*, recorded many times on dead tendrils and runners of hop in Europe. Stromatic, separate, thick-walled pycnidia, erumpent at maturity, characterized by biguttulate fusiform α-conidia, 5–6(–7.5) × 2–3 µm, produced on short, rarely septate conidiophores [this may be why it has been classified in *Plenodomus*]. According to Wehmeyer (1933: 320) *Phomopsis sarmentella* should be the anamorph of *Diaporthe sarmenticia* Sacc., but experimental proof of this has not been documented.

24. **Plenodomus inaequalis** Sacc. & Trotter

Plenodomus inaequalis Saccardo & Trotter in Bresadola & Saccardo, Bull. Soc. r. Bot. Belg. 38 (1899) 167.

Material examined. Type on fronds of *Pandanus* sp., Congo: coll. A. Dewèvre, no date (Herb. Saccardo, PAD).

IDENTIFICATION

≡ ***Stilbophoma inaequalis*** (Sacc. & Trotter) B.C. Sutton, Coelomycetes (1980) 558.

The stromatic conidiomata of this fungus, 400–800 µm diam., only look superficially like *Plenodomus*. They have an extremely thick dark brown dome-shaped upper wall and an hyaline base with stilboid arranged filiform conidiophores with many septa. Ostioles were not observed. The conidia, 4.5–7 × 2–2.5 µm, arise immediately below septa. The fungus is probably commonly associated with *Pandanus* spp. (compare Saccardo, 1903 and Mathur, 1979: 226). The type species of *Stilbophoma* Petrak (1942) is found on palm fronds in India and produces very small conidia (2–3 × 1 µm: *S. microspora* Petrak); the genus had remained unispecific until the addition of *S. inaequalis*.

25. **Plenodomus macropodii** Petrak

Plenodomus macropodii Petrak, Hedwigia 68 (1929) 237.

Material examined. Type on stem pieces of *Macropodium nivale* (Cruciferae), Siberia, southern Altaj, Sarymsak, Russia: coll. K.E. Murashkinsky (Sib. agric. Acad. Omsk), 30 July 1926 (Herb. Petrak, W).

IDENTIFICATION

= ***Phoma nigrificans*** (P. Karsten) Boerema et al., Jl Phytopath. 115 (1986) 269–270 (teleom. *Didymella macropodii* Petrak).

The above synonymy is based on a comparison of type material with fresh isolates, see Boerema, Loerakker & Wittern (1986). The black massive pycnidia, mostly 175–375 µm diam., are *Plenodomus*-like, thick-walled and often with a conspicuous poroid neck. However, scleroplectenchyma is lacking [cell-wall JKJ–]: *Phoma* sect. '*Sclerophomella*' (see no. 11). The conidia are oblong-ellipsoidal to subcylindrical, mostly 6–8.5(–10) × 1.5–2.5(–3) µm, eguttulate or with a small guttule at each end. It appears to be a cold-tolerant fungus, found on various wild and cultivated crucifers in northern Europe. It is believed to be an opportunistic parasite. In northern Germany it has often been isolated from winter oilseed rape (*Brassica napus* var. *oleifera*) with Blackleg symptoms resembling those caused by *P. lingam*.

26. '**Plenodomus** on spotted apples', **Malus pumila**

Plenodomus species described in Japanese by Kanesuke Hara, 'Zikken-Sakumotu-byorigaku' (1930) 527.

Original material. Not known to be in existence cf. inf. Dr Hideo Ishii, Fruit Res. Stn Yatabe, Ibaraki, Japan (1984). The pycnidia occurred on round or irregular, dark brown spots on apple fruits (*Malus pumila*, Rosaceae), 7–13 mm diam. The name of the disease in Japanese is 'Ansyoka-hanten-byo'.

IDENTIFICATION

= ***Asteromella pomi***, *spec. nov.*

Pycnidia ostiolata-papillata, 50–115 µm diam., 70–125 µm alta. Paries e duobus stratis parenchymaticis constat, cellulae strati exterioris magis crassitunicatae et intus obscuriores quam cellulae strati interioris. Conidiophora e strato interiore ad basim et peripheriam oriuntur, septata, 0.8–1 µm diam. Cellulae conidiogenae, semper discretae, hyalinae, breves. Conidia numerosa capitulata, hyalinae, nonseptatae, duabus vacuolis obscuris praeditae, 2–2.5(–3.5) × (0.8–)1 µm. Holotypus in fructibus mali, *Malus silvestris (M. pumila)* 'Granny Smith', Bilpin, New South Wales, Australia, Aprilis 1974, DAR 25767 (Penrose, 1984: 23).

[Species first recognized by Brooks & Black, 1912, but misidentified as '*Phoma pomi* Pass.' (Fig. 9), see discussion below; collection and culture (CBS) made by Brooks now shown to be quite effete; compare Westerdijk & van Luyk, 1920 and Penrose, l.c.]

Teleomorph: *Mycosphaerella* sp., Walton & Orton (1926) [Misidentified as '*Mycosphaerella pomi* (Pass.) Lindau', see below].

Hyphomycetous anamorph: *Pseudocercosporella pomi* (Brooks) Noordeloos & Boerema (1988).

Hara's *Plenodomus* sp. from a fruit spotting disease of apple in Japan, clearly refers to the above thick-walled *Asteromella* species, first discovered in the United States on a similar apple fruit spot, popularly known as 'Brooks spot' (for history see Anderson, 1956). Hara's Japanese description of the anamorph may be translated as follows (cf. Dr. Ishii, l.c.): "Pycnidia initially subepidermal, subglobose, later erumpent, up to 200–300 µm diam. Wall made up of thick- and thin-walled polygonal cells, 3–6 µm diam. Sporophores tight-packed, filiform, 0.8–1 µm in diameter and up to 20–30 µm long. Spores ellipsoidal to cylindrical, obtuse at both ends, 2.5–3 × 0.8–1 µm, hyaline." The relatively large pycnidial dimensions given by Hara probably represent crowded pycnidia in which the walls may be wanting at the point of contact (compare Brooks & Black, l.c.). The 'pycnidiospores' arise from the apices of indistinct filiform columns of cells. They have never been observed to germinate and probably function as spermatia. The associated *Mycosphaerella* species, found on the surface of fallen apple leaves (Walton & Orton, 1926), was originally thought to be identical with *M. pomi* (Pass.) Lindau, but was later shown to be distinct (cf. holotype of *Sphaerella pomi* Pass., PAD: which has significantly broader ascospores and asci). In culture the fungus produces the hyphomycetous conidial anamorph *Pseudocercosporella pomi*, commonly known as *Cylindrosporium pomi* Brooks (Noordeloos & Boerema, 1988). The latter is also found on spotted over-ripe apples. Brooks & Black erroneously identified the pycnidial anamorph with *Phoma pomi* Passerini (1888: 96; illegitimate as later homonym of *Phoma pomi* Schulzer & Saccardo), a common European species with larger spores = *Asteromella mali* (Briard) Boerema in Boerema & Dorenbosch (1965).

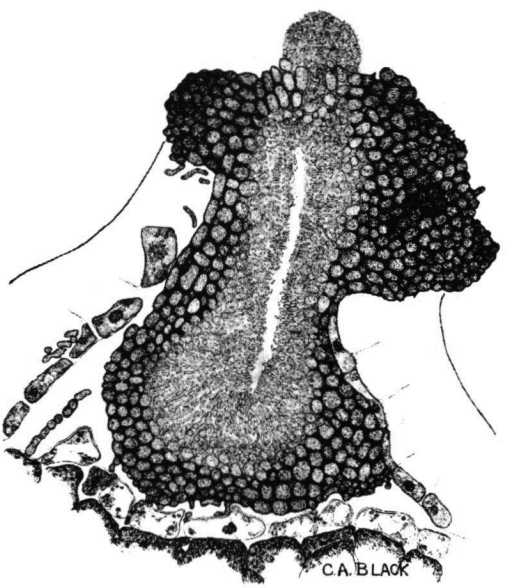

Fig. 9. *Asteromella pomi*. Reproduction of '*Phoma pomi*' by C.A. Black in Brooks & Black (1912: Pl. 5, fig. 8).

The 'Brooks spot' fungus of apples is known from North America (USA, Canada), Australia (New South Wales) and South and East Asia (India and Japan), see Penrose, l.c. It is probably a plurivorous opportunistic parasite, which also has been recorded in association with Blotching of quinces, *Cydonia vulgaris* (Brooks & Black, l.c.) and a Shoot Blight of *Ocimum sanctum* (Noordeloos & Boerema, l.c.).

27. **Plenodomus metasequoiae** Gucevicz

Plenodomus metasequoiae Gucevicz, Trudy gos. nikit. bot. Sada 32 (1960) 125.

Material examined. Type on short-shoots of *Metasequoia glyptostroboides* (Taxodiaceae), Nikitzki Botanical Garden, Tauria, Russia, 1957 (LECB via IBFI).

IDENTIFICATION

= ***Gloeosporidina moravica*** Petrak, Annls mycol. 19 (1921) 214; type species of the genus *Gloeosporidina* Petrak.

The characteristics of *Plenodomus metasequoiae* (Fig. 10) agree with those of Gloeosporidina *moravica* as figured by Sutton & Pollack (1973: figs. 10–12, syntype of *G. moravica* BPI). Circular subepidermal acervular conidiomata, composed of a somewhat

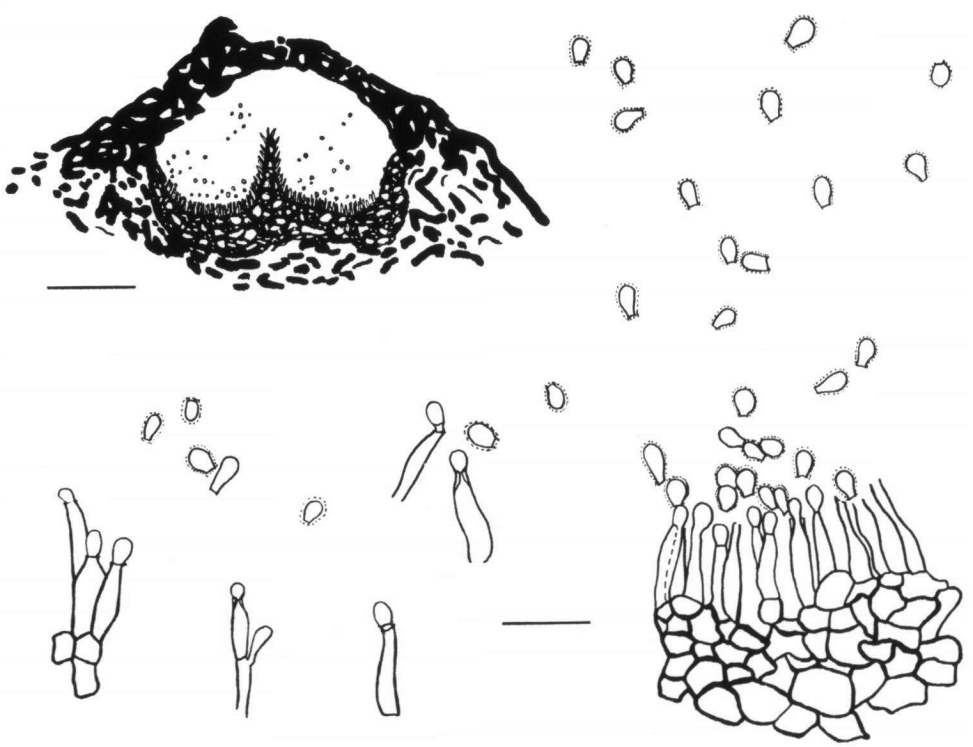

Fig. 10. *Gloeosporidina moravica*. Sketch of a subepidermal acervulus and drawings of conidia and cylindrical conidiogenous cells from the holotype of the synonym *Plenodomus metasequoiae* (LECB). Conidia with truncate base and slimy coating. Bar acervulus 100 µm. Bar conidia/conidiogenous cells 10 µm.

convex thick layer of polygonal pseudoparenchymatous cells of variable dimensions. Conidiophores cylindrical, vertically parallel, mostly 10 × 2 µm, formed from the upper pseudoparenchyma, and bearing a distinct apical collarette. Conidia pyriform, with truncate base and a somewhat slimy coating, eguttulate, 2.5–3.5 × 2–2.5 µm. Gucevicz's classification of the fungus in *Plenodomus* is possibly based on the 'closed' subepidermal position of the conidiomata ('non-ostiolate') and the relatively thick basal cell layer ('sclerotioid').

Gloeosporidina moravica is apparently a plurivorous necrophyte with a Eurasian distribution. The type specimen of the fungus is on leaves of *Quercus robur*, Mt. Svrčow near Mähr.-Weisskirchen (now Hranice), Czechia (former Czechoslovakia).

28. **Plenodomus mollerianus** Bres.

Plenodomus mollerianus Bresadola, Bolm Soc. Brot. 9 (1891) 6.

Material examined. Type on leaves of *Eucalyptus globulus* (Myrtaceae), S. Bento near Coimbra, Portugal: coll. Moller, Feb. 1890 (Herb. Bresadola, S).

IDENTIFICATION

= ***Pilidium concavum*** (Desm.) Höhnel, Sber. Akad. Wiss. Wien [Math.-naturw. Kl., Abt. I] 124 (1915) 148 (teleom.: *Pezizella oenotherae* (Cooke & Ellis) Sacc.).

The type collection of *Plenodomus mollerianus* is typical of the plurivorous *Pilidium concavum* (Leptostromaceae). Shield-shaped eustromatic conidiomata, 80–150 µm diam., with septate branched cylindrical conidiophores, producing falcate-lunate conidia, mostly 4–7 × 1.5–2 µm, apically and just below the septa. The fungus has numerous synonyms in different genera, see Sutton (1980). It is also described as *Leptothyrium fixum* Sacc., Bolm Soc. Brot. 11 (1893) 20, from leaves of *Eucalyptus globulus* in Portugal collected at the same location as *Plenodomus mollerianus*. The plurivorous type species of the genus *Pilidium, P. acerinum* Kunze in Kunze & Schmidt, Mykol. Hefte 2 (1823) 92, is also frequently recorded on *Eucalyptus* spp. *Pilidium acerinum* is distinguished by much larger conidia (mostly 14–16 × 2 µm, see Sutton, 1980).

29. **Plenodomus mori** (Mont.) Höhnel

Plenodomus mori (Mont.) Höhnel, Sber. Akad. Wiss. Wien [Math.-naturw. Kl., Abt. I] 119, 1 (1910) 660. — *Phoma mori* Montagne, Annls Sci. nat. (Bot.) III, 12 (1849) 306. — *Aposphaeria mori* (Mont.) Saccardo, Sylloge Fung. 3 (1884) 174. — *Coniothyrium mori* (Mont.) O. Kuntze, Revisio Gen. Pl. 3, 2 (1898) 459.

Original material "on decorticated wood of *Morus alba* (Moraceae) near Perpignan, France, 1830" could not be traced (not in PC), but was examined by Von Höhnel (1910: 66).

IDENTIFICATION

= ***Phomopsis moricola*** (Sacc.) Saccardo, Nuovo G. bot. ital. II, 22 (1915) 50 [≡ *Phomopsis moricola* (Sacc.) Grove, Bull. misc. Inf. 1917 (1917) 59].

According to Von Höhnel (l.c.) the type specimen was characterized by convex stromatic conidiomata, 160–250 µm diam., densely crowded on the wood, initially closed, later irregular ruptured; conidiophores 10–12 µm long, conidia fusiform, 8–9.5 × 2 µm. Von Höhnel's classification of this fungus as "a typical *Plenodomus* Preuss ..., perhaps

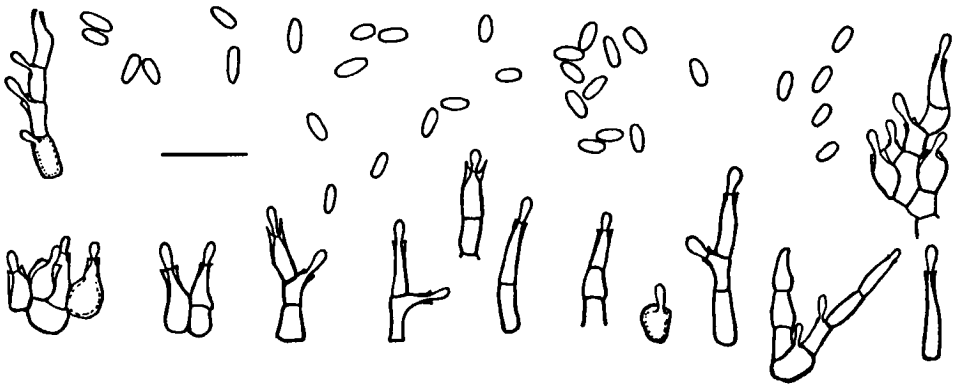

Fig. 11. *Pleurophoma cava*. Drawings of conidia, conidiophores and conidiogenous cells, from a specimen on *Morus albus* (PC; as '*Phoma mori*'). Bar 10 µm.

the anamorph of *Diaporthe sociabilis* Nitschke" was in concurrence with his original view of the synonymy of *Plenodomus* Preuss with *Phomopsis* (Sacc.) Sacc. (Von Höhnel, 1909; recanted by Von Höhnel in 1918). It concerns a species of *Phomopsis* which has been described several times from dead branches and twigs of the white mulberry; see Uecker (1988). Transfer of *Phoma mori* Mont. to *Phomopsis* should result in a later homonym of the synonym *Phomopsis mori* Woronichin, Vêst. tiflis. bot. Sada 35 (1914) 22. The oldest valid name in the genus *Phomopsis* appeared to be the *Phomopsis moricola* mentioned above, based on *Phoma moricola* Saccardo, Michelia 1 (5) (1879) 525. As well as Von Höhnel, Wehmeyer (1933: 119) believed this anamorph should belong to *Diaporthe sociabilis* Nitschke [later synonym *Diaporthe mori* Berl., listed by Kendrick (1979: 301) and Uecker (1988)], but experimental proof is not documented.

Finally it should be noted that specimens labelled '*Phoma mori* Mont.', distributed as Mycoth. univ. [Ed. Thum.] Cent. 17 (1880) No. 1682 refer to a distinctly different lignivorous anamorph, popularly known as *Phoma cava* Schulzer (Boerema & Dorenbosch, 1973: 23–24). On account of its conidiogenesis (Fig. 11) this small-spored species is best placed in the genus *Pleurophoma* Höhnel, type species *Pleurophoma pleurospora* (Sacc.) Höhnel, see Sutton (1980) and the discussion under *Plenodomus pyracanthae*, no. 35.

Pleurophoma cava (Schulzer), *comb. nov.*

Basionym: *Phoma cava* Schulzer von Müggenburg, Verh. zool.-bot. Ges. Wien 21 (1871) 1248.

30. **Plenodomus nigricans** Negodi

Plenodomus nigricans Negodi, Atti Soc. Nat. Mat. 63 [VI, 11] (1932) 44.

Original material "on rotten and dried leaves of *Sanseviera stuckii* (Agavaceae), leaf cuttings from Somalia, Botanical Garden Univ. Modena, Italy, Feb. 1932" apparently not preserved.

IDENTIFICATION

= ***Diplodia subsolitaria*** (Schw.: Fr.) Currey, Trans. Linn. Soc. Lond. 22 (4) (1859) 284.

The description and figures of *P. nigricans* clearly point to an immature stage of a species of *Diplodia* Fr. [in Montagne, 1834: 302] conformity with Sutton's (1980) concept of the genus. The mature stage appears to have been described as *Diplodia sansevieriae* [H. & P.] Sydow, Annls mycol. 14 (1916) 200. The fungus produces conspicuous dark brown to black mycelium and black solitary pycnidia, mostly 200–500 µm diam. The pycnidia are unilocular, globose and thick-walled with a broad outer layer of dark brown cells and an inner layer of hyaline cells; initially closed, then later develop a central papillate pore. Conidiophores short cylindrical, septate, c. 10 µm long and 2–3 µm wide, each forming a single apical conidium. Conidia ellipsoidal to oblong-ovoid with a truncate base, at first hyaline and aseptate, later dark brown and medianly 1-septate, (18–)20–26(–28) × 10–12(–13) µm. In a comparative study of this didymosporous type of the Sphaeropsidales Zambettakis (1954) has, however, referred them to the genus *Metadiplodia* Sydow [1937]. He concluded that *D. sansevieriae* belongs to a plurivorous cosmopolitan species, which had already been described in Fries's Elenchus Fungorum (1828) from material collected by Von Schweinitz in the USA (*Sphaeria subsolitaria* 'Schwein. in litt.'). Its teleomorph may be a species of *Botryosphaeria* [Von Schweinitz's collection is also believed to contain an Ascomycete: *Physalospora subsolitaria* (Schw.) Saccardo, Sylloge Fung. 13 (1898) 443].

31. **Plenodomus oleae** Cav.

Plenodomus oleae Cavara, Atti Ist. bot. Univ. [Lab. crittogam.] Pavia II, 1 (1888) 435 [Appunti Patol. veg. (1888) 13]; Revue mycol. 10 (1888) 206–207. — *Phoma oleae* (Cav.) Saccardo, Sylloge Fung. 10 (1892) 146.

Material examined. Phoma olivarum Thümen on mature fallen olives (*Olea europaea*, Oleaceae), Dalmatia, Croatia (former Yugoslavia): coll. L. Roesler, 'May', distributed as (part of) Mycoth. univ. No. 2885 (L) and as Roum., Fungi. gall. exs. No. 4748 (PC).

IDENTIFICATION

= ***Phoma glomerata*** (Corda) Wollenweber & Hochapfel, Z. ParasitKde 8 (1936) 592, the plurivorous type species of *Phoma* sect. *Peyronellaea.*

The original material of *Plenodomus oleae*, described from brown spots on olives in Italy, has been lost, but was studied by Berlese (1889). He concluded that it did not show any *Plenodomus*-like characteristics, but represented a typical ostiolate *Phoma* species resembling the previously described *Phoma olivarum* Thumen (1883). Boerema, Dorenbosch & van Kesteren (1977) provided evidence that the latter refers to the ubiquitous soil-borne *Phoma glomerata*, which frequently occurs on olives in southern Europe. The present species concept of *P. glomerata* (see Contribution II–2 no. 2, Boerema, 1993), is mainly based on the characteristics in vitro, especially those of the dictyochlamydosporal *alternarioid* synanamorph. In vivo dictyochlamydospores are sometimes produced on the pycnidial wall near the ostiole. The conidia of *P. glomerata* are highly variable in shape and dimensions, mostly ovoid-ellipsoidal, 4–8.5 × 1.5–3 µm, usually smaller in vivo than in vitro. In old pycnidia the conidia become olive-brown and sometimes 1-septate.

32. '**Plenodomus orthoceras** Höhnel'

'*Plenodomus orthoceras* (Fr.) v H (= *Phoma achillea* Sacc.) Spermog. v. *Diaporthe orthoceras*' in herb. W [manuscript name].

Material examined. Collection on stems of *Cirsium* sp. (Compositae), Sonntagsberg, Austria: coll. P.P. Strasser, June 1909 [originally labelled '?*Libertella*'] (W, no. 16952).

IDENTIFICATION

≡ ***Phomopsis*** sp. with only β-conidia.

In June 1909 Von Höhnel published his subsequently recanted statement that *Plenodomus* Preuss must be considered an earlier synonym of *Phomopsis* (Sacc.) Sacc. The same month he received the above collection which he referred to *Plenodomus* even though it bore typically thick-walled unilocular *Phomopsis*-like pycnidia with filiform conidiophores and filiform-hamate β-conidia, 24–25 × 1 μm. The epithet of *Plenodomus orthoceras* refers to *Sphaeria orthoceras* Fr.: Fr., by Nitschke, (1870: 270) used as basionym of a *Diaporthe*-teleomorph found on *Achillea* species: *D. orthoceras* (Fr.: Fr.) Nitschke. The anamorph of the latter should produce α- and β-conidia (Nitschke, l.c.): 'spermatia' fusiform, 8–10 × 2.5 μm; 'stylospores' filiform-hamate, 26 × 1 μm. The α-conidia type is known as *Phoma achillea* Saccardo [Michelia 2 (3) (1882) 616; conidia 9–10 × 2.5–3.5 μm], transferred by Von Höhnel to *Phomopsis*: *P. achillea* (Sacc.) Höhnel, Sber. Akad. Wiss. Wien [Math.-naturw. Kl., Abt. I] 115 (1906) 680. Wehmeyer (1933) listed *D. orthoceras* as a synonym of *Diaporthe arctii* var. *achillea* (Auersw.) Wehm., which affects different hosts, including *Cirsium* spp. That teleomorph may therefore cover this *Phomopsis* sp. from *Cirsium*. However, different host-specific species are probably involved because recent studies on the *D. arctii*-complex have shown that Wehmeyer's broad species concept is untenable when the host-specific forms are compared in vitro and when biological (ecological) data are considered, see Van der Aa, Noordeloos & de Gruyter (1990).

33. **Leptophoma paeoniae** Hohnel

Leptophoma paeoniae Höhnel, Sber. Akad. Wiss. Wien [Math.-naturw. Kl., Abt. I] 124 (1915) 75. — *Sphaeronaema paeoniae* Höhnel in Strasser, Verh. zool.-bot. Ges. Wien 60 (1910) 312 [as '*Sphaeronoma*'; nomen nudum].

Material examined. Type on stems of *Paeonia* sp. (Ranunculaceae), Sonntagsberg, Austria: coll. P.P. Strasser, 1908 (Herb. Von Höhnel No. 9394, FH).

IDENTIFICATION

≡ ***Phoma nebulosa*** (Pers.: Fr.) Berkeley, Outl. Br. Fungi (1860) 314 [as *P. nebulosa* 'Mont.'].

As noted by Von Höhnel (1915b, l.c.) this fungus superficially resembles *Phoma acuta*, type species of *Leptophoma* = sect. *Plenodomus* (see Contribution III-1 no. 15a, b). However, the pycnidia are relatively thin-walled and not at all scleroplectenchymatous; they usually have dark hyphae at the base and a distinct neck. Conidiogenous cells ampulliform, often with a conspicuous neck, 8–10 μm long. Conidia oblong to ellipsoidal, mostly 3.5–6.5 × 1.5–2 μm (i.e. wider than as noted by Von Höhnel).

Phoma nebulosa is a saprophytic species which can be found on dead stems of various herbaceous plants in Europe, but the most common host is apparently stinging nettle, *Urtica dioica*. For the historical background of this fungus see Boerema (1976: 306–307). For diagnostic data on the characteristics in vitro see Contribution I–2 no. 22 (De Gruyter, Noordeloos & Boerema, 1993).

Fig. 12. *Phoma genistae*. Drawings of conidia and conidiogenous cells in vivo on *Genista tinctoria*, from '*Plenodomus pulcherrimus*' (herb. Petrak, W). Bar 10 µm.

34. 'Plenodomus pulcherrimus Petrak'

'*Plenodomus pulcherrimus* n. spec.' in herb. Petrak (W) [manuscript name for a 'Sclerophomee'-species mentioned by Petrak (1923b) in the discussion of his *Sclerophomella abnormis*].

Material examined. Original collection associated with the type of *Sclerophomella abnormis* Petrak, on dried branches of *Genista tinctoria* (Leguminosae), edge of a wood near Hrabuvka, Mähr.-Weisskirchen (now Hranice), Czechia (former Czechoslovakia): coll. F. Petrak, 18 March 1922 (Herb. Petrak, W).

IDENTIFICATION

≡ ***Phoma genistae*** Brunaud, Annls Soc. Sci. nat. Charente-Infér. 1889 (1890) 64 [Sphaerops. Char. ('1889') 14].

This 'Sclerophomee' is characterized by Petrak (1923b: 214) as truly 'dothideoid' with short cylindrical or elongate-ellipsoidal conidia c. 4–6 × 2–2.5 µm. Study of the above collection convinced us that a *Phoma* specific to *Genista tinctoria* is involved; it may produce small pycnidial as well as larger stromatic conidiomata (pseudoparenchymatous, JKJ–, just like *Phoma foveata* Foister, compare Kranz, 1963: 12–13). The correct name of the fungus is *Phoma genistae*, but the dothideoid phenotype has already been described as *Placosphaeria genistae* Brunaud, Act. Soc. linn. Bordeaux 52 (1888) 102 [Miscell. mycol. I (1889) 17]. The conidia usually have a large vacuole. Their variability in shape is associated with a gradual widening of the conidiogenous locus: conidia often with a truncate base, see Fig. 12.

Curiously Petrak's *Sclerophomella abnormis* did appear to be *Plenodomus*-like: thick scleroplectenchymatous pycnidial wall (JKJ+). The characteristics of *S. abnormis* agree with those of the plurivorous *Phoma astragalina* (Gonz.-Frag.) Boerema & v. Kest. (Contribution III–1 no. 4). Pycnidia mainly depressed globose to ellipsoidal, 150–300 µm, but also up to 600 µm and then more irregular in shape, unilocular but sometimes semi-multilocular due to wall-outgrowths. Conidia small ellipsoidal 2–3(–4) × 0.5–1 µm, with two minute guttules. So far *P. astragalina* is only known from mountainous regions in southwestern Asia (Afghanistan, Iran, Turkey).

35. Plenodomus pyracanthae Gucevicz

Plenodomus pyracanthae Gucevicz, Nov. Sist. niz. Rast. 14 (1977) 79.

Original material "on dry branches of *Pyracantha angustifolia* (Rosaceae), Nikitzki Botanical Garden, Tauria, Russia: coll. L.V. Malzeva, 1960" apparently not preserved cf. inf. Dr V. Mel'nik (1982) (LECB).

IDENTIFICATION

= ***Pleurophoma pleurospora*** (Sacc.) Höhnel, Sber. Akad. Wiss. Wien [Math.-naturw. Kl., Abt. I] 123 (1914) 117, type species of the genus *Pleurophoma* Höhnel.

The description and illustration of *Plenodomus pyracanthae* are typical of the above *Pleurophoma pleurospora*, which we have studied in vivo and in vitro from branches and bare wood of *Acer, Cornus, Fraxinus, Pyracantha, Salix* and *Kerria* spp. The fungus is characterized by single, subglobose, dark brown, thick-walled pycnidia, up to 300 µm diam., with circular, central ostioles and straight, filiform, septate conidiophores, formed from the inner cells of the pycnidial wall. The small, cylindrical to ellipsoidal, eguttulate conidia arise from the apices and just below the septa of the conidiophores. The conidial dimensions of the various collections were within the range 3–4 × 1–1.5 µm; the septate conidiophores were mostly 30–50(–55) × 2 µm. For details of pycnidial wall and conidiophores see Sutton (1980: 397–399). The fungus may be identical to *Sphaeronaema subtile* Fr.: Fries (1823).

36. **Plenodomus ramealis** (Desm.) Höhnel

Plenodomus ramealis (Desm.) Höhnel, Sber. Akad. Wiss. Wien [Math.-naturw. Kl., Abt. I] 119 (1910) 647. — *Sporonema ramealis* Desmazières, Annls Sci. nat. (Bot.) III, 16 (1851) 320–321. — *Phomopsis ramealis* (Desm.) Höhnel, Öst. Bot. Z. 66 (1916) 100; not *Phomopsis ramealis* (Desm.) Diedicke, Annls mycol. 9 (1911) 28–29, see below.

Material examined. Syntype on dry branch of elder *Sambucus nigra* (Caprifoliaceae), 'autumn and spring', France, distributed as Desm., Pl. cryptog. France II [ed. 3] Fasc. 2, No. 82 (PC).

IDENTIFICATION

= ***Phomopsis vicina*** (Desm.) Grove, Bull. misc. Inf. R. bot. Gdns Kew (1917) 71; Br. Coelomycetes 1 (1935) 224.

The stromatic pycnidial anamorph, which Von Höhnel (1910) studied from an original sample of 'Pl. crypt. France, 1843, Nr 82' on elder, *Sambucus nigra*, were typical of a *Phomopsis* species: stromatic small-celled closed conidiomata, up to 520 µm long and 120 µm high, with a flattened loculus. Conidia fusiform, 8–10 × 2–2.5 µm, borne on punched conidiophores. Von Höhnel (1910, l.c.) identified the species as "certainly a *Diaporthe*-anamorph which therefore must be classified in *Plenodomus* Preuss = *Phomopsis* Sacc." The latter generic synonymy was suggested by Von Höhnel in 1909, but afterwards recanted. The combination *Phomopsis ramealis* made by Von Höhnel, l.c. in 1916 must be rejected as a later homonym of a combination made by Diedicke, l.c. based on *Phoma ramealis* Desmazières, Annls Sci. nat. (Bot.) III, 3 (1850) 113, found on branches of *Euonymus* spp. As also noted by Von Höhnel (1916, l.c.) the next oldest known name of the elder fungus is *Phoma vicina* Desmazières, distributed as Pl. cryptog. N. France (1856) No. 353 (e.g. PC), basionym of the above *Phomopsis vicina*. The fungus is better known under the synonym *Phomopsis sambucina* (Sacc.) Trav., based on *Phoma sambucina* Saccardo, Michelia 2 (1) (1880) 97, see e.g. Petrak (1925b) and Grove (1935, l.c.). The acicular-filiform or subulate conidiophores are mostly 15–20(–25) × 1.5–2 µm. According to Von Höhnel (1916, l.c.) and Wehmeyer (1933) this anamorph belongs to *Diaporthe circumscripta* Otth, but this should be considered tentative since experimental proof is not documented. Finally it should be noted that not all samples of Desm., Pl.

cryptog. France No. 82 contain fertile *Phomopsis* pycnidia. The 'preparation' of 82 we received from PC had numerous small-celled stromata without any spores. A few deviating conidiomata looked very much like an effete *Colletotrichum*. That fungus was probably also present on the sample of 82 studied by Limber (1955: 'conidia 12–20 × 4–6 µm').

37. **Diploplenodomus rivini** (Allescher) Petrak

Diploplenodomus rivini (Allescher) Petrak, Annls mycol. 42 (1944) 62. — *Pyrenochaeta rivini* Allescher in P. Sydow, Hedwigia 36 (1897) 161 [with discordant setae-bearing element]. — *Sclerochaetella rivini* (Allescher) Höhnel, Hedwigia 59 (1918) 251.

Material examined. Type collection of the basionym on stem pieces of *Falcaria rivini* (Umbelliferae), Lichtenfelde near Berlin, Germany: coll. P. Sydow, Nov. 1895 (Herb. Allescher, M); duplicates distributed as Sydow, Mycoth. March. No. 4454 (Herb. Sydow, S; B).

IDENTIFICATION

= ***Phoma complanata*** (Tode: Fr.) Desmazières, Annls Sci. nat. (Bot.) III, 16 (1851) 299–300; type species of *Phoma* sect. *Sclerophomella*.

The holotype of *Pyrenochaeta rivini* has been examined by Petrak (l.c.) and basically we agree with his conclusion that Allescher's description refers to a mixture of glabrous thick-walled pycnidia with mainly 1-septate hyaline conidia, 12–16 × 3.5–4 µm, and sterile *Vermicularia*-like setose structures (discordant element). Duplicates of the original material of *Pyrenochaeta rivini* distributed by Sydow as Mycoth. March. No. 4454, were mostly effete. Petrak (l.c.) examined two samples of 4454 and found no fertile fungus. A sample studied by Diedicke (1912a) was also sterile and contained only the setose *Vermicularia*-like structures. We made the same observation on 4454 from B; but the duplicate in S agrees in all respect with Allescher's type collection (Fig. 13A). Von

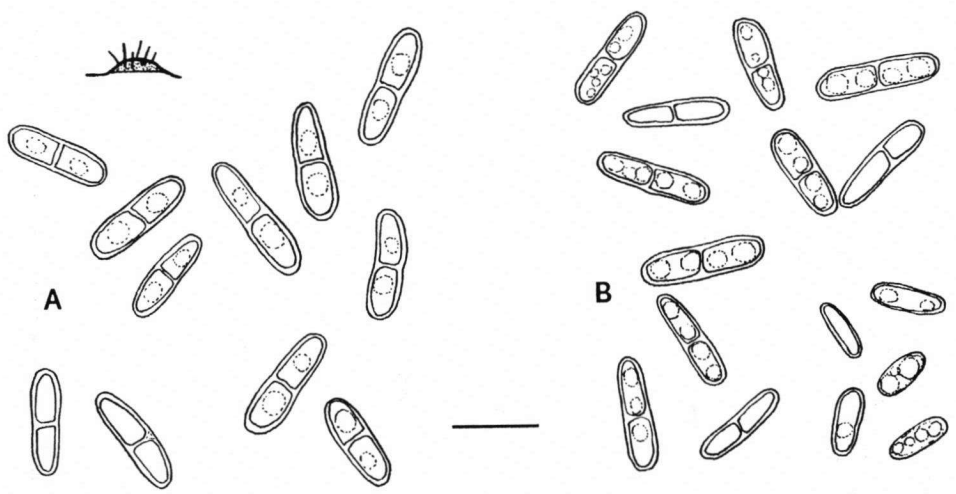

Fig. 13. *Phoma complanata*. Drawings of large 1-septate conidia from specimens on two different umbellifers. – A. Isotype of '*Diploplenodomus rivini*' on stem of *Falcaria rivini* (S) [Original classification in *Pyrenochaeta* was based on the presence of a discordant element: sterile *Vermicularia*-like setose structures (see sketch)]. – B. Specimen on stem of *Pimpinella major* (PD) [Also pycnidia with mainly small aseptate conidia (right below) were present.] Identity checked by isolations in pure culture. Bar 10 µm.

Höhnel (l.c.) based on a sample of Sydow's Mycoth. March. 4454 a separate genus: *Sclerochaetella*: papillate stromatic pycnidia 'somewhat setose above' and with finally 1-septate conidia. Von Höhnel found only two setae but referred to Diedicke's (1912a) observations.

The pycnidia of the fungus, 300–400 µm diam., are clearly thick-walled, but not scleroplectenchymatous as in *Phoma* sect. *Plenodomus* (cell-wall JKJ–; but cell contents become red). The structure of the pycnidial wall fully agrees with that of *Phoma complanata*, the type species of *Phoma* sect. *Sclerophomella*, see this paper under *Plenodomus complanatus*, no. 11. It is known that some strains of this common species on Umbelliferae may produce pycnidia in vivo which have mainly 1-septate conidia, similar to those of Allescher's fungus (see Fig. 13B). Therefore we consider both fungi to be conspecific, which also means that *Sclerochaetella* should be considered as a synonym of *Phoma* sect. *Sclerophomella*.

38. **Plenodomus spurius** (Vestergren) Petrak

Plenodomus spurius (Vestergren) Petrak, Fl. Boh. Morav. exs. II, 1 (1918) No. 2431 [compare Annls mycol. 39 (1941) 307]. — *Phoma spurius* Vestergren, JahresKat. Wien. Krypt. Tauschanst. (1897) 4. — *Paradiscula spuria* (Vestergren) Petrak, Annls mycol. 39 (1941) (307–)308.

Material examined. Collection on stem pieces of *Potentilla argentea* (Rosaceae), Mt. Svrčow near Mähr.-Weisskirchen (now Hranice), Czechia (former Czechoslovakia): coll. F. Petrak, May 1936, distributed as Petrak, Myc. gen. No. 195 (FH).

IDENTIFICATION

= ***Paradiscula spuria*** (Vestergren) Petrak (l.c.), type species of the genus *Paradiscula* Petrak.

This only known species of the genus *Paradiscula* is fully illustrated and described by Morgan-Jones (1975). Petrak's initial classification of the fungus in *Plenodomus* was based on over-ripe material. The fungus produces eustromatic conidiomata, 200–500 µm diam. Wall thicker at the base than the sides and above, made up of thin-walled pale brown cells. Dehiscence by a widely opening longitudinal wall fissure. Conidiogenous cells lageniform, 5–14 × 2–3.5 µm, formed from the basal and lateral walls. Conidia oblong-ellipsoidal, 4–6 × 1.5–2 µm. Petrak (1941) noted that this fungus is exceptional in its tendency to produce abnormal structures; deeply immersed conidiomata may become very irregular in shape, semi-multilocular and without the common thick basal stroma.

39. **Plenodomus strobilinus** (Desm.) Höhnel

Plenodomus strobilinus (Desm.) Höhnel, Sber. Akad. Wiss. Wien [Math.-naturw. Kl., Abt. I] 119, 1 (1910) 647. — *Sporonema strobilinum* Desmazières, Annls Sci. nat. (Bot.) III, 18 (1852) 368. — *Discella strobilina* (Desm.) Diedicke, Krypt.-Fl. Mark Brandenb. 9, Pilze 7 (1915) 752. — *Sirococcus strobilinus* (Desm.) Petrak, Sydowia 1 (1947) 155 [illegitimate; proposed as substitute for *Sirococcus strobilinus* Preuss, Linnaea 27 (1853) 716, the type of *Sirococcus* Preuss].

Material examined. Type of basionym on cones of '*Abies excelsa*' = *Picea abies*, the Vosges, France, 'winter' no date: coll. J.B. Mougeot (PC); duplicates distributed as Pl. cryptog. France No. 700 (PC).

IDENTIFICATION

= ***Sirococcus conigenus*** (DC.) P. Cannon & Minter, Taxon 32 (1983) 57, type species of the genus *Sirococcus* Preuss.

Examination of the above type specimens confirmed Petrak's (l.c.) inference that *Sporonema strobilinum* Desm. is conspecific with the type species of the genus *Sirococcus* Preuss (l.c.), presently known as *Sirococcus conigenus*. For the characteristics of this fungus see Sutton (1980: fig. 371). Thick-walled stromatic conidiomata, uni- or multilocular, initially closed, then opened by breakdown of the upper wall. Conidiophores filiform, branched and septate, up to 50 µm long × 2.5 µm wide, tapering to 1.5 µm. Conidia (6–)12–15(–16) × (2.5–)3(–3.5) µm, arising from the apices of main and short lateral branches, fusiform, straight or curved, medianly 1-septate; smaller ones occasionally remaining aseptate. The fungus is found on cones and needles of various conifers in Eurasia and North America, where it causes Short Blight and Tip Dieback. In phytopathological literature it is commonly named either *Ascochyta piniperda* Lindau [in Engler & Prantl, Nat. Pfl. Fam. 1 (1) (1899) 368] or *Sirococcus strobilinus* Preuss. Von Höhnel's interpretation of the fungus as *Plenodomus* dates from the period when he regarded *Plenodomus* Preuss as an older synonym of *Phomopsis* (Sacc.) Sacc. (Von Höhnel, 1909, synonymy recanted in 1918). He noted that the 'cartilagenous-gelatinous-plectenchymatous' *Plenodomus strobilinus* probably belonged to *Diaporthe occulta* (Fuckel) Nitschke. This suggestion, initially adopted by Wehmeyer (1932: 251), was later questioned (Wehmeyer, 1933: 72).

40. **Plenodomus sylvaticus** (Sacc.) Rupprecht

Plenodomus sylvaticus (Sacc.) Rupprecht, Sydowia 13 (1959) 21 [as '*silvatica*'].

Material examined. Type of basionym on stems of *Melampyrum sylvaticum* (Scrophulariaceae), near Rouen, Dep. de l'Eure, France: coll. A. Malbranche, no date (Herb. Saccardo, PAD); specimens on stems of *Melampyrum nemorosum*, Podluze near Stanislau (now Ivano-Frankovsk), the Ukraine (former USSR): coll. Petrak, 9 June 1918, distributed as Petrak, Fungi Pol. exs. No. 481 (U); specimens on *Melampyrum nemorosum*, Hrabuvka, Mähr.-Weisskirchen (now Hranice), Czechia (former Czechoslovakia): coll. Petrak, 28 Sept. 1923, distributed as Petrak, Fl. Boh. Morav. exs. II, 1 No. 1870 (U).

IDENTIFICATION

= ***Phoma sylvatica*** Saccardo, Michelia 2 (2) (1881) 337; Sylloge Fung. 3 (1884) 128 [as '*silvatica*'].

A very common fungus on *Melampyrum* spp. in Europe, characterized by small pycnidia, c. 150 µm diam., with a relatively thick wall made up of round polygonal cells. The contents of these cells stains red with addition of JKJ (typical for species of *Phoma* sect. *Sclerophomella*, type *P. complanata*, see no. 11). The conidia of this species, ellipsoidal to subcylindrical, (3.5–)4–5 × 1–1.5(–2) µm, are very similar to those of *Phoma petrakii* Boerema & v. Kest., a member of sect. *Plenodomus*, which also commonly occurs on stems of *Melampyrum* spp. (Contribution III–1 no. 10). The combination *Plenodomus sylvaticus* made by Rupprecht is partly based on misidentified collections of *P. petrakii* on *Melampyrum* spp. and partly on confusion with *P. ruttneri* (Petrak) Boerema & v. Kest., another species of sect. *Plenodomus* (Contribution III–1 no. 6), see Boerema & van Kesteren (1981). The pycnidia of *P. sylvatica* are often accompanied by pseudothecia of *Didymella winteriana* (Sacc.) Petrak, its teleomorph according to Petrak (1922: 323). However, a single identity of these two morphs has not yet been proved with isolates in pure culture.

41. **Plenodomus syriacus** Petrak

Plenodomus syriacus Petrak, Sydowia 1 (1947) 42.

Material examined. Original collection on stem pieces of *Phlomis brevilabris* (Labiatae), subalpine region of Mt. Sanin (1700–1900 m), Lebanon (Flora Syriaca No. 1340): coll. J. Bornmüller, 21 July 1897, placed in two paper packets as type specimens of '*Plenodomus syriacus* n. sp.' and '*Didymella syriacus* n. sp.' (Herb. Petrak, W).

IDENTIFICATION

= ***Phoma syriaca*** (Petrak), *comb. nov.* (probable teleomorph: *Didymella syriaca* Petrak).

The relatively large pycnidia (200–350 µm diam.) of this 'alpine' collection resembled a *Plenodomus* type: thick-walled (35–50 µm thick) and initially closed (late development of a pore instead of a predetermined ostiole). However, typical scleroplectenchyma was lacking: JKJ did not stain the walls of cells but only their contents. These characteristics point to *Phoma* sect. *Sclerophomella* (type *P. complanata*, see this paper no. 11). The conidia are notably broad, ovate-ellipsoidal, occasionally with somewhat truncate ends, mostly 6–8 × 3.5–6 µm. The pycnidia, scattered or arranged in small groups, often occurred in association with pseudothecia of *Didymella syriaca* Petrak, the teleomorph according to Petrak (1947). Pycnidia and pseudothecia developed subepidermally on the stems, in both cases with at the sides dark, twisting, short-celled hyphae. The identity of the two morphs has not yet been proved with isolates in pure culture, but in this connection it should be noted that various species of *Phoma* sect. *Sclerophomella* belong to *Didymella* spp.

42. **Deuterophoma ulmi** (Verrall & May) Goid. & Rugg.

Deuterophoma ulmi (Verrall & May) Goidànich & Ruggieri, Ricerca scientifica 17 (1947) 1137 ['pro tempore']. — *Dothiorella ulmi* Verrall & May, Mycologia 29 (1937) 322. — *Plectophomella ulmi* (Verrall & May) Redfern & Sutton, Trans. Br. mycol. Soc. 77 (1981) 383.

Material examined. Type of basionym on *Ulmus* sp. (Ulmaceae), Britton, Oklahoma, USA: coll. J.M. Turner, 1 Oct. 1935 (BPI no. 70805).

IDENTIFICATION

= ***Plectophomella ulmi*** (Verrall & May) Redfern & Sutton, l.c.; synanamorph *Phialophora* sp.

Goidànich & Ruggieri, l.c., transferred this American wilt pathogen of *Ulmus* spp. (Verrall & May, 1937) to the genus *Deuterophoma* Petri, mainly because of the in vitro production of a *Phialophora* synanamorph, just like the type species of Petri's *Deuterophoma* (*Phoma tracheiphila* (Petri) Kant. & Gik., see Contribution III–1 no. 21). However, the stromatic pycnidia of the American pathogen, c. 100 µm diam., usually multiloculate or convoluted, are not scleroplectenchymatous and the conidia arise from distinct conidiophores (Redfern & Sutton, 1981, with figure). The latter are either short and 1-septate or long and up to 6-septate, with mostly short lateral branches produced below the septa, and branched irregularly at the base, 10–32.5 × 2–2.5 µm. Conidia ellipsoidal to cylindrical, 2.5–4 × 1–1.5 µm. These characteristics agree neither with '*Deuterophoma*' (*Phoma* sect. *Plenodomus*) nor *Dothiorella* Sacc. (cf. type study, Sutton, 1980), but fit well with *Plectophomella* Moesz. For cultural characteristics of the fungus and the *Phialo-*

phora synanamorph (conidia 4.5 × 2 µm), see Verrall & May, l.c. *Plectophomella concentrica* Redfern & Sutton (l.c.: 383–385), a related fungus lacking a *Phialophora* synanamorph, is known to cause canker and dieback of *Ulmus glabra* in Europe (Great Britain).

43. **Leptophoma urticae** (Schulzer & Sacc.) Höhnel

Leptophoma urticae (Schulzer & Sacc.) Höhnel, Hedwigia 59 (1917 [vol. dated 1917–1918]) 262. — *Phoma urticae* Schulzer & Saccardo, Hedwigia 23 (1884) 91; Sylloge Fung. 3 (1884) 140.

Material examined. Collection of *Phoma urticae* on dead stem pieces of stinging nettle, *Urtica dioica* (Urticaceae), distributed as D. Saccardo, Mycoth. ital. (1904) No. 1267 (Herb. Saccardo, PAD). Dried culture of *Phoma urticae* 'strain 25', obtained by Dennis (1946) from a previous season's stem of *Urtica dioica*, Corstorphine, near Edinburgh, Scotland, 20 March 1944 (K).

IDENTIFICATION

= ***Phoma herbarum*** Westend., Bull. Acad. r. Belg. Cl. Sci. 19 (1852) 118; type species of *Phoma* (sect. *Phoma*).

The original material of *Phoma urticae* on stems of *Urtica dioica*, collected in Vinkovce, Hungary, is not preserved, but Boerema (1964, 1970) provided evidence for its conspecificity with the cosmopolitan saprophyte *P. herbarum*. This interpretation is confirmed by the specimens listed above. The fungus usually produces non-papillate pseudoparenchymatous pycnidia with one ostiole; conidia measure (3.5–)4–5.5(–8) × 1.5–2(–3) µm. For additional data on cultural characteristics see Contribution I–2 no. 4 (de Gruyter, Noordeloos & Boerema, 1993).

Von Höhnel's interpretation of *P. urticae* relates to the quite different fungus *Pyrenochaeta fallax* Bres. emend. Sutton & Pirozynski (1963), a specific necrophyte of *Urtica dioica*, with more or less setose scleroplectenchymatous pycnidia, branched septate conidiophores from which the relatively small conidia (5–6 × 1.5 µm) arise apically or just below the septa. The scleroplectenchymatous wall structure of this species fully agrees with the anamorph of another specific nettle fungus on which Von Hohnel had founded his genus *Leptophoma*: *Phoma acuta* (Hoffm.: Fr.) Fuckel subsp. *acuta* (sect. *Plenodomus*, Contribution III–1, teleom. *Leptosphaeria doliolum* Ces. & de Not. subsp. *doliolum*). Both anamorphs may occur on the same nettle stem [Schneider (1979) found only *P. acuta* on authentic collections of *Pyrenochaeta fallax*!]. Several species producing scleroplectenchyma probably occur within the genus *Pyrenochaeta* de Not. emend. Schneider, l.c. (see also no. 12, *Pyrenochaeta* 'sect. *Plenodomopsis*').

44. **Plenodomus valentinus** Caballero

Plenodomus valentinus Caballero, An. Jard. bot. Madr. 1 (1941) 195–196.

Material examined. Type on leaves of the wild date palm, *Phoenix silvestris* (Palmae), Botanical Garden Valencia, Spain: coll. A. Caballero, 10 April 1938 (MA).

IDENTIFICATION

= ***Phomopsis phoenicis*** (Cesati) Camara, Anais Inst. sup. Agron. Univ. téc. Lisb. 3 (1929) 102.

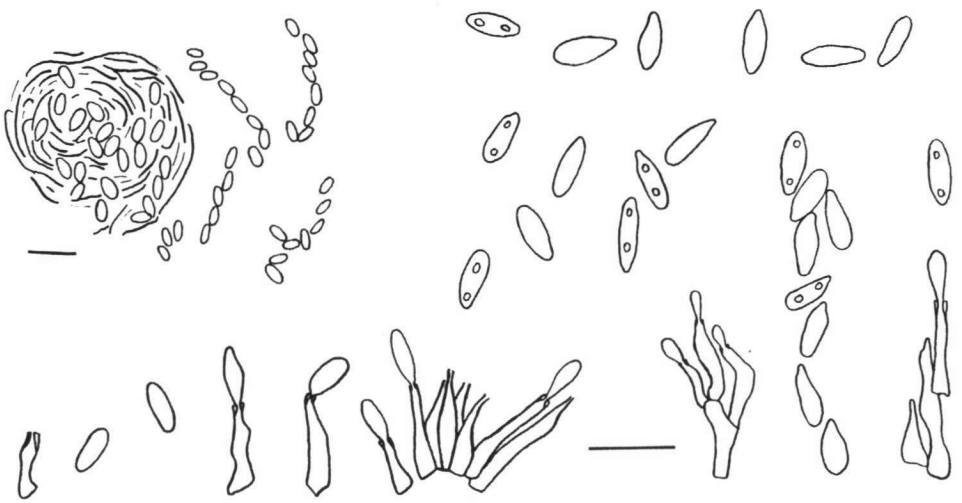

Fig. 14. *Phomopsis phoenicis*. Drawings of α-conidia and conidiophores from the holotype of the synonym *Plenodomus valentinus* (MA). Bar 10 µm. The reproduction from Caballero (1941) clearly shows that the conidia are enveloped in mucilage and often produced in series of eight ('ascus'-like rows).

Plenodomus valentinus refers to a curious species of *Phomopsis* often producing 'ascus-like' rows of eight α-conidia (Fig. 14.). Pycnidia subepidermal, mostly globose and uniloculate, up to 130 µm diam., sometimes aggregated and convoluted, initially closed, later with an erumpent papillate ostiole. Conidiophores short-filiform, sparingly branched, up to 13 µm long, producing apically a series of a-conidia enveloped in mucilage. Conidia ellipsoidal-fusiform, 0–2 guttulate, mostly (5–)6.5–7.5(–8) × 2–2.5(–3) µm. This species fully agrees with *Sphaerella phoenicis* Cesati, described on spathes of a date palm from the Naples botanical garden, Italy and distributed as Rabenhorst, Fungi europ. exs./Klotzschii Herb. mycol. Cont. No. 2531 (1881) (e.g. in BR); it was then transferred to *Phoma* by Saccardo: *P. phoenicis* (Ces.) Sacc., Bull. Soc. r. Bot. Belg. 31 (1892) 232. The first classification in *Phomopsis* dates from the early twenties when Gonzáles Fragoso in Assoc. Esp. Progr. Ci. Congr. Oporto Ci. Nat. 6 (1921) 39 proposed replacing Saccardo's combination by *Phomopsis cesatii* Gonz.-Frag. (illegitimate nom. nov.). Another synonym is *Phoma magnusii* Bommer & Rousseau, Bull. Soc. r. Bot. Belg. 25 (1886) 177, reported on leaves of a date palm in the Gent botanical garden, Belgium (cf. holotype, BR).

45. **Plenodomus verbascicola** (Schw.) Moesz

Plenodomus verbascicola (Schw.) Moesz, Bot. Kozl. 28 (1931) 167–168. — *Sphaeria verbascicola* Schweinitz, Trans. Am. phil. Soc. II, 4 (1832 ['1834'] = Synopsis Fung. Am. bor.) 221 [No. 1726.581]. — *Phoma verbascicola* (Schw.) Cooke "in Ravenel, Fungi Am. No. 141" (1878). — *Sclerophomella verbascicola* (Schw.) Höhnel, Hedwigia 59 (1917 [vol. dated '1917–1918']) 239. — *Mycosphaerella verbascicola* (Schw.) Fairman, Proc. Rochester Acad. Sci. 4 (1905) 176.

Material examined. Representative portion of type material of *Sphaeria verbascicola* on three stem pieces and a capsule of *Verbascum* sp. (Scrophulariaceae), Bethlehem, Pennsylvania, USA, mounted with

the reference '1726.581 - Syn Fung.' (written by Michener cf. Arthur & Bisby, 1918) and duplicates on stem pieces in three original paper packets: coll. L.D. von Schweinitz ['L.v.S.'] (Herb. von Schweinitz, PH). Duplicates of the original material in the 'National Fungus Collections' (BPI) and the 'Collins Collection' (PH), each consisting of one stem piece.

IDENTIFICATION

= Basionym refers to immature pseudothecia, probably belonging to a species of ***Pleospora*** Rabenh. ex Ces. & de Not.

The original material of *Sphaeria verbascicola* in Von Schweinitz's herbarium and the National Fungus Collections contains many immature pseudothecia. The duplicate in the Collins Collection bears also some mature pseudothecia with cylindrical clavate asci containing eight dark brown ascospores, 17.5–24 × 5.5–7 µm, with 4–6 transverse septa and 1–3 longitudinal septa in the central cells. These characteristics point to a species of *Pleospora* resembling *P. scrophulariae* (Desm.) Höhnel recorded on various herbaceous plants in Europe, see Munk (1957). There are no indications that the immature ascomata refer to a species of *Mycosphaerella* as suggested by Fairman, l.c. The pycnidial interpretation of Von Schweinitz's *Sphaeria verbascicola*, especially the records under *Phoma* (Cooke, l.c. and Allescher, 1899), refers in many cases to *Phoma poolensis* var. *verbascicola* (Ell. & Ev.) van der Aa & Boerema (sect. *Phoma*, see Contribution I–2, de Gruyter, Noordeloos & Boerema, 1993). The records under *Sclerophomella* and *Plenodomus* (Von Höhnel, l.c., Moesz, l.c. and Petrak, 1923a) relate to a typical representative of sect. *Plenodomus*, viz. *Phoma acuta* subsp. *errabunda* (Desm.) Boerema et al. (teleom. *Leptosphaeria doliolum* subsp. *errabunda* Boerema et al., see Contribution III–1 no. 15b).

APPENDIX

Documentation of herbarium specimens which refer to members of *Phoma* sect. *Plenodomus* (incorporated in the index).

'Plenodomus galeopsidis Rupprecht'

'*Plenodomus galeopsidis* m. det. Rupprecht' in herb. B [manuscript name].

Material examined. Collection, originally labelled '*Phoma* Berkeley Sacc.', on stem pieces of *Galeopsis ochroleuca* (Labiatae), Siegen, Westfalen, Germany: coll. A. Ludwig, 1 May 1947 (Herb. Ludwig, B).

IDENTIFICATION

= ***Phoma doliolum*** P. Karsten, Meddn Soc. Fauna Flora fenn. 16 (1888) 9–10 (teleomorph: *Leptosphaeria conoidea* (de Not.) Sacc.).

The morphological characteristics of the typical '*Plenodomus*'-like pycnidia in this collection on *Galeopsis* agree with the in vivo pycnidia of the plurivorous *Phoma doliolum* of sect. *Plenodomus* (cf. Contribution III–1 no. 19). Pycnidia depressed globose with a short sunken papillate neck, mostly 250–300 µm diam.; wall scleroplectenchymatous with basal more or less parallel cell-structure. Conidia oblong-ellipsoidal to subcylindrical, eguttulate, 6–9 × 2–3 µm (av. 7 × 2.5 µm). The '*Phoma acuta*' recorded on *Galeopsis tetrahit* (Magnus, 1898: 85) may also refer to this plurivorous *Phoma* species. However, it should be noted that the host specific *Leptosphaeria galeopsidicola* Petrak (see Holm, 1957; Shoemaker, 1984) may produce a similar scleroplectenchymatous *Phoma* anamorph.

'Plenodomus glechomae Rupprecht'

'*Plenodomus glechomae* n. sp. det. Rupprecht' in herb. B [manuscript name].

Material examined. Collection, originally labelled '*Phoma herbarum*?', on old stolons of ground ivy, *Glechoma hederacea* (Labiatae), in 'Kleinwaldchen' near Forbach, Lotharingen (Lorraine), France: coll. A. Ludwig, 16 April 1914 (Herb. Ludwig, B).

IDENTIFICATION

= ***Phoma enteroleuca*** Sacc. var. ***enteroleuca***.

This collection on ground ivy contains typical previous season's scleroplectenchymatous pycnidia of *Phoma enteroleuca*, commonly found on bark and wood of deciduous trees and shrubs in Europe (cf. Contribution III–1 no. 23a). Subglobose pycnidia becoming papillate; wall often with irregular invaginations and consisting of scleroplectenchyma cells of variable size. Conidia relatively small, 3–4(–4.5) × 1–2 µm, ellipsoidal or ovoid, mostly eguttulate. It is conceivable that in the vicinity of trees and shrubs this fungus could occasionally also spread to herbaceous plant remains. The non-fluorescing variety of *P. enteroleuca* has also been reported on a herbaceous plant (Boerema & Loerakker, 1985: table 1).

'Plenodomus scrophulariae Rupprecht'

'*Plenodomus scrophulariae* n. sp. det. Rupprecht' in herb. B [manuscript name].

Material examined. Collection originally labelled '*Phoma herbarum* det. Sydow', on stems of figwort, *Scrophularia nodosa* (Scrophulariaceae), in 'Kleinwäldchen' near Forbach, Lotharingen (Lorraine), France: coll. A. Ludwig, 17 Dec. 1911 (Herb. Ludwig, B).

IDENTIFICATION

= ***Phoma acuta*** subsp. ***errabunda*** (Desm.) Boerema et al. (teleomorph: *Leptosphaeria doliolum* subsp. *errabunda* Boerema et al.).

The scleroplectenchymatous pycnidia in this collection on dead figwort stems fully agree with those of the plurivorous *Phoma acuta* subsp. *errabunda* (compare Contribution III–1 no. 15b). Pycnidia subepidermal, depressed globose, with a short poroid papilla; wall scleroplectenchymatous with somewhat elongated basal cells. Conidia subcylindrical, eguttulate, 4–5 × 1.5–2 µm (av. 4 × 2 µm). This necrophyte has been previously recorded on *Scrophularia* spp.: Saccardo (1884: 133) and Lucas & Webster (1967).

Plenodomus svalbardensis Lind

Plenodomus svalbardensis Lind, Skr. Svalbard Ishavet 13 (1928) 35.

Material examined. Two small fragments of the type collection on basal leaves of *Draba alpina*, Magdalena Bay, Svalbard: coll. H. Resvoll-Holmsen, 17 August 1907 (O). Most material was sent to Prince Albert I^{er} of Monaco, who financed the expedition cf. inf. Dr I. Jörstad (1966), but apparently not preserved cf. inf. Dr. J. Alinat (1973), Inst. Océanographique, Monaco-Ville.

IDENTIFICATION

= ***Phoma pedicularis*** Fuckel.

The description of *Plenodomus svalbardensis* and detailed study of a single pycnidium found on the sparse original material, convinced us that it belonged to the plurivorous

arctic-alpine *Phoma pedicularis* of sect. *Plenodomus* (cf. Contribution III–1 no. 20): pycnidia subglobose, initially closed and relatively small, 200–300 µm diam., containing eguttulate cylindrical conidia, mostly 5–6 × 2 µm.

Phoma pedicularis was first found on dead leaves of a *Pedicularis* sp. near the Matochkin Shar (Straits) of Novaya Zemlya. The pycnidia usually become larger under snow cover and may develop conspicuous dark elongated beak-like necks. The conidia of *P. pedicularis* vary markedly in shape and size; they may be oblong-ellipsoidal to cylindrical, 4–6(–8.5) × 2(–3) µm, as recorded for *Plenodomus svalbardensis*, but also oval-ovoid to nearly spherical, 4–6 × 2.5–4.5 µm. For other characteristics of *P. pedicularis* in vivo and in vitro see Boerema, van Kesteren & Loerakker (1981: 65–71).

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