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PHOMA PISKORZII (PETRAK) COMB. NOV., THE ANAMORPH OF LEPTOSPHAERIA ACUTA (FUCKEL) P. KARST.

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The pycnidial state of *Leptosphaeria acuta* appeared to be identical with the lectotype of *Diploplenodomus piskorzii*, and belongs to *Phoma* sect. *Plenodomus*. The binomials *Phoma acuta*, *Leptophoma acuta* and *Plenodomus acuta* are misapplied ambiguous names often referring to the anamorph of *Leptosphaeria doliolum* sensu stricto.

The conical perithecia (pseudothecia) of *Leptosphaeria acuta* (Fuckel) P. Karst. can be found in Europe nearly everywhere in winter and spring at the base of dead nettle stems, particularly *Urtica dioica*. Nettles are apparently the only hosts of this fungus; old records on other plants have not been confirmed by recent workers (Müller, *1950*; Holm, *1957*).

Superficially the perithecia of *L. acuta* may be confused with those of *Leptosphaeria doliolum* (Pers. ex Hook.) Ces. & de Not. sensu stricto (=subsp. *doliolum* var. *doliolum* cf. Boerema, *1976*), which occur in late summer and autumn on dead last year's nettle stems. *L. acuta*, however, is easy to distinguish by the relatively long and multiseptated ascospores: mostly 45–54 × 4.5–7 µm with 8–13 septa (in *L. doliolum* sensu stricto mostly 25–30 × 4–5 µm with 3 septa).

The perithecia of *L. acuta* are just like those of *L. doliolum*, characterized by the development of more or less thick-walled hyaline cells in the peridium: scleroplectenchyma (Holm, l.c.) Typical scleroplectenchyma can be differentiated by addition of Lugol's iodine: their cell walls then stain red by adsorption of the iodine (blotting-paper effect).

Most species of *Leptosphaeria* with a typical scleroplectenchymatous wall structure (Holm l.c.: 'group doliolum') also produce *Phoma*-like pycnidia which have a similar wall structure. This has been demonstrated experimentally for the various infraspecific taxa of *L. doliolum*, see Boerema l.c. These scleroplectenchymatous *Phoma*-like anamorphs are at present arranged under *Phoma* sect. *Plenodomus* (Boerema *& al., 1981*) originally founded as a separate form-genus *Plenodomus* Preuss (*1851*); synonyms *Leptophoma* Höhnel (*1915*) and *Diploplenodomus* Diedicke (*1912*). According to this classification the correct name of the anamorph of the collective species *L. doliolum* is *Phoma hoehnelii* Kest. (van Kesteren, *1972*). The anamorph of *L. doliolum* sensu stricto, which commonly occurs on dead nettle stems can be classified as *Phoma hoehnelii* subsp. *hoehnelii* var. *urticae* Boerema & Kest. (Boerema, *1976;* conidial dimensions usually (3–)3.5–5(–5.5) × 1–1.5(–2) µm).

In older literature it has been repeatedly suggested that the anamorph of *Leptosphaeria acuta* is represented by *Phoma acuta* (Cooke, *1871;* Karsten, *1873;* Grove, *1935*), also

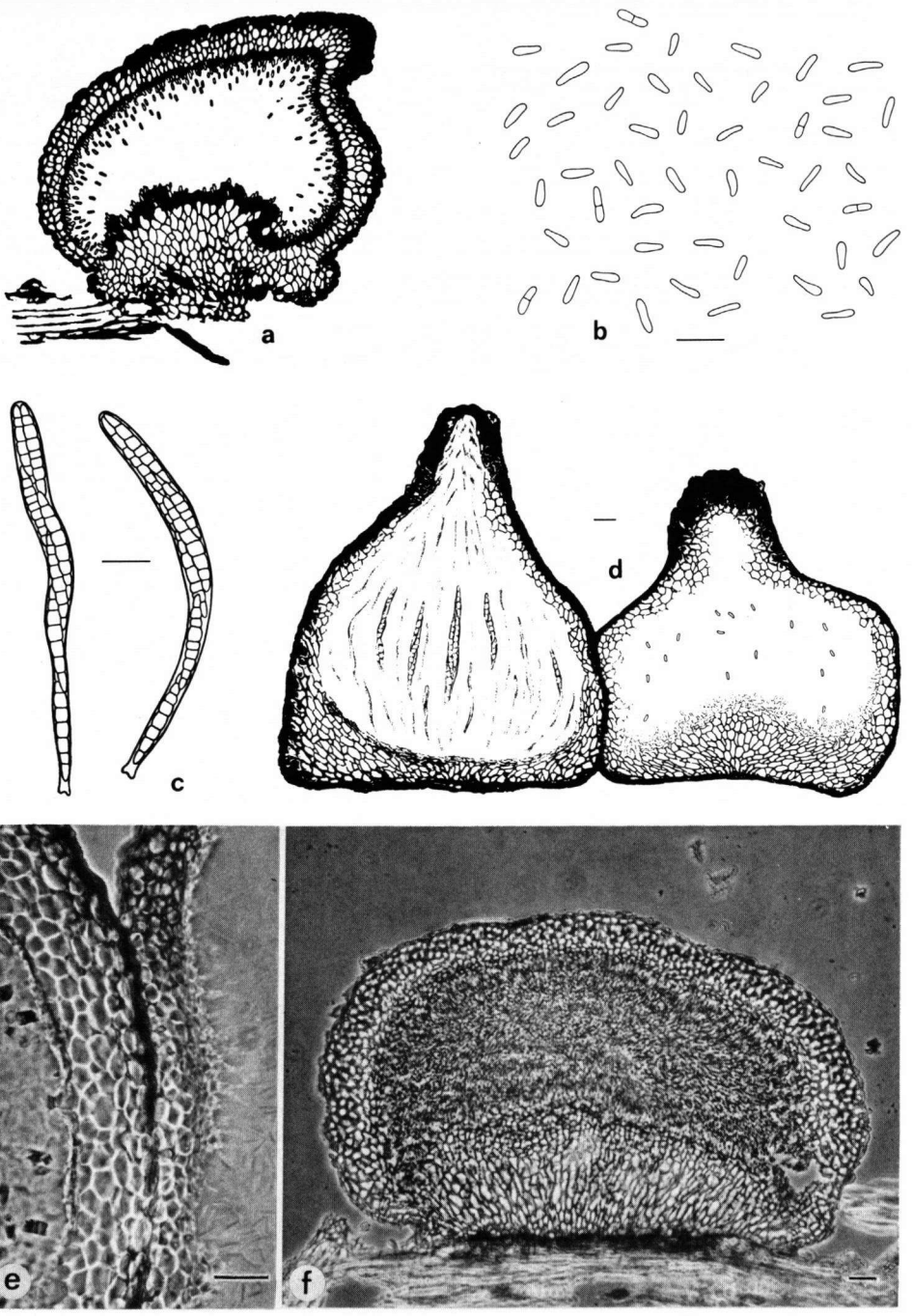
known as *Leptophoma acuta* (von Höhnel, *1915*) and *Plenodomus acutus* (Bubák, *1915;* Petrak, *1921*). The epithet of these names can be traced back to *Sphaeria acuta* Hoffmann (*1787*) ex S. F. Gray (*1821*), a *Sphaeronaema*-like pycnidial state described from branches and bare wood, which is certainly not related to *Leptosphaeria acuta*. The descriptions under the misapplied binomials *Phoma acuta, Leptophoma acuta,* and *Plenodomus acutus* refer partly to the above mentioned *Phoma hoehnelii* var. *urticae,* the anamorph of *Leptosphaeria doliolum* sensu stricto on *Urtica dioica,* and partly to two other species of *Phoma* sect. *Plenodomus,* viz. *Phoma leonuri* Letendre, the anamorph of *Leptosphaeria slovacica* Picb. on *Ballota nigra,* and *Phoma sydowii* Boerema *& al.* on *Senecio fuchsii* (Boerema *& al., 1981*). For more details of the concatenation of misapplications of *Sphaeria acuta* Hoffm. ex Gray reference may be made to Boerema (*1976*), who concluded that this name (epithet) should be rejected according to Art. 69 of the Code (ambiguous name).

Using the normal laboratory procedure of culturing fungi on standardized agar media at room temperature with alternating periods of light and darkness, ascospore isolates of *Leptosphaeria acuta* produce only sterile mycelium. The first record of cultural experiments which demonstrated the metagenetic relation between a *Phoma*-like anamorph and *Leptosphaeria acuta* can be found in Müller & Tomaševič (*1957*). These authors, however, did not give any details of their experiments and also adopted the misapplied name *Phoma* (*Leptophoma*) *acuta*. Exact information on the anamorph of *Leptosphaeria acuta* was first given in the cultural study of this fungus by Lacoste (*1965*). He found that the fungus requires relatively low temperature of about 10 °C, for fructification. At this temperature Lacoste obtained pycnidia in vitro on sterilized stems of *Urtica dioica* and leaves of *Typha latifolia* inoculated with single ascospore cultures. On nettle the pycnidia developed simultaneously with perithecia; on *Typha latifolia* the pycnidia were produced before the development of perithecia. In culture on synthetic media the fungus produced perithecia at 10 °C. He concluded: 'La formation des fructifications asexuelles semble donc exiger, outre les mêmes conditions physiques que celles, nécessaires à la fructification sexuelle, des conditions nutritives, mal définies mais assez strictes.'

Lacoste further notes that the *Plenodomus*-like anamorph of *L. acuta* also frequently occurs in nature, but 'en raison de la multiplicité des formes de même type sur la tige sèche d'ortie, elle peut souvent être confondue avec celle des espèces voisines, de *L. doliolum* notamment.' Lacoste's drawing of a vertical section of a pycnidium of *L. acuta* on a nettle stem has been reproduced in Fig. 1a (with permission of the author). He added the following description.—

'La coupe ci-jointe permet de se rendre compte de la structure puissante de ces curieuses pycnides souvent imperforées, qui s'ouvrent par rupture et jamais par un pore bien organisé. La paroi est constituée à l'extérieur de plusieurs couches de cellules fortement pigmentées. Vers l'intérieur les

Fig. 1. *Leptosphaeria acuta,* stat. anamorph *Phoma piskorzii.* on dead nettle stems. — a. Pycnidium after Lacoste (*1965*). France. — b. Conidia from pycnidium coalesced with perithecium (see d.), Netherlands, 1977. — c. Asci after Lacoste (*1965*), France. — d. Coalesced perithecium and pycnidium, Netherlands, 1977. — e. Micrograph of detail of d: coalesced perithecial and pycnidial wall. — f. Micrograph of pycnidium from lectotype of anamorph (W), Czechoslovakia, 1922. Scale bars = 20 µm.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couches de cellules deviennent de plus en plus hyalines. La cavité interne est tapissée de très nombreux conidiophores, serrés, les uns contre les autres et très courts. Leur ensemble constitue une couche plus pigmentée. A la partie inférieure, un épaississement de la paroi forme une sorte de base d'appui sur la tige d'ortie et une saillie dans la cavité interne. Les conidies hyalines, cylindriques, longues de 8–9 µ sur 2 à 3 µ sont produites en très grande quantité.'

In the springtime we repeatedly find this anamorph of *L. acuta*, which can be distinguished at once from the anamorph of *L. doliolum* by the relatively large conidia. At first the pycnidia develop usually inside the hollow nettle stems, which may explain why they often have been overlooked. Later, the pycnidia also develop on the outside of the stems, between the perithecia. Sometimes the fruitbodies of the anamorph and teleomorph of *L. acuta* are even coalesced, see Fig. 1d, e. Specimens collected in winter often showed only the teleomorph, so that in nature the development of perithecia apparently precedes the development of pycnidia. The previous year's dead nettle stems may bear in autumn only the anamorph.

The pycnidia are variable in shape, up to 500 µm diam., flattened-subglobose, usually papillate but also with a prolonged neck. They may be opened by rupture or by the development of a narrow ostiole (pore; compare Boerema & van Kesteren, *1964*). The conidia we measured (compare Fig. 1b) varied usually between (6–)8–10(–12) × 2–2.5(–3) µm, but incidentally also extreme long conidia (up to 16 µm) have been observed. They are mostly continuous but occasionally two-celled by an indistinct septum, which phenomenon had been apparently overlooked by Lacoste.

Comparative study with old herbarium material revealed that Petrak had already examined and described this anamorph of *L. acuta* in 1923 from dead stems of *Urtica dioica* collected September 1922 by J. Piskoř in the 'Ritscher'-forests near 'Sternberg in Mähren' (Sternberk, Moravia), Czechoslovakia (preserved in Petrak's herbarium, W). Petrak classified it as a species of *Diploplenodomus* on account of the occasionally occurring two-celled conidia: 'Konidien . . .einzellig oder ungefähr in der Mitte mit einer undeutlichen Querwand, 6–12 × 2–2,75 µm'. He notes that Piskoř found similar scleroplectenchymatous pycnidia on dead stems of various other herbaceous plants in the 'Ritscher'-forests, e.g. on *Atropa belladonna*. Petrak therefore concluded that it concerns a plurivorous species, although he observed substantial differences in the conidial dimensions of the specimens on *Urtica* and *Atropa*. He named the species after the collector *Diploplenodomus piskorzii* Petrak.

The scleroplectenchymatous pycnidia on the dead stems of *Atropa belladonna* collected by J. Piskoř (also preserved in Petrak's herbarium, W) appeared to belong to the large spored *Phoma hoehnelii* subsp. *amplior* (Sacc. & Roum.) Boerema & Kest., the anamorph of the plurivorous *Leptosphaeria doliolum* subsp. *pinguicula* Sacc. (Boerema, *1976*). The conidia of *P. hoehnelii* subsp. *amplior* are extremely variable in vivo; they may be still longer than those of the anamorph of *L. acuta*, and moreover they are also occasionally two-celled. The synonymy of *P. hoehnelii* subsp. *amplior* includes e.g. *Diploplenodomus malvae* Diedicke (*1912;* holotype in Herb. von Höhnel, FH) and *Diploplenodomus microsporus* (Berl.) Höhnel (*1918; = Plenodomus microsporus* Berlese, *1889*; representative specimen in Herb. Diedicke, JE), of which Petrak had already noted that their descriptions agreed with the characteristics of the specimens collected by Piskoř. Petrak, however, had not seen herbarium specimens of *D. malvae* and *D. (P.) microsporus* (which he also considered to be indentical), and finally concluded on account of the description of *D. microsporus* by von

Höhnel (*1918*) that *D. piskorzii* represents a different species. This now appears to be correct but only so far as it concerns the specimens on nettle. Therefore we hereby designate Piskoř's collection on *Urtica dioica* as lectotype of *Diploplenodomus piskorzii* Petrak. In accordance with the present classification of this kind of pycnidial states it needs to be transferred to *Phoma* sect. *Plenodomus*.—

Phoma piskorzii (Petrak) Boerema & Loerakk., *comb. nov.*; anamorph of *Leptosphaeria acuta* (Fuckel) P. Karst.

Basionym: *Diploplenodomus piskorzii* Petrak *in* Annls mycol. **21**: 123–124(–125). 1923. — Lectotype: on dead stems of *Urtica dioica*, collected by J. Piskoř, September 1922 in the 'Ritscher'-forests, near Sternberk, Moravia, Czechoslovakia (Herb. Petrak, W as Herb. Mus. Nat. Vind. No. 1225).

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