


Species Placed by Saccardo in the Genus Phoma. Part II
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Source: *Bulletin of Miscellaneous Information (Royal Botanic Gardens, Kew)*, Vol. 1919, No. 10 (1919), pp. 425-445
Published by: Springer on behalf of Royal Botanic Gardens, Kew
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Mendoncia Meyeniana, *Nees* in DC. Prod. xi., p. 51 (1847) *Mendozia Meyeniana,* Nees in Mart. Fl. Bras. vol. ix., p. 11 (1847).

Mendoncia Perottetiana, *Nees* in DC. Prod. xi., p. 53 (1847). *Mendoncia Sellowiana,* Nees, var. *Perrottiana,* Miquel, Stirp. Surinam. Select., p. 128 (1850).

Mendoncia racemosa, *Nees* in DC. Prod. xi., p. 54 (1847). *Mendozia racemosa,* Ruiz et Pav. Syst. Veg. Flor. Peruv. et Chil., p. 158 (1798); Pers. Synops. 2, p. 175 (1807).

Engelia tovarensis, *Kl. et Karst* ex Nees in DC. Prod. xi., p. 721 (1847).

Engelia villosa, *Kl. et Karst* ex Nees in DC. Prod. xi., p. 721 (1847).

Species excluda.

Mendoncia madagascariensis, Radlk. in Bremen, Abh. viii., p. 467 (1884), is *Monochlamys flagellaris,* Baker in Journ. Linn. Soc. xx., p. 217, tab. 26 (1883).

XXXII.—SPECIES PLACED BY SACCARDO IN THE GENUS PHOMA.

PART II.

W. B. Grove.

These notes are a continuation of those which have already appeared in *Kew Bulletin,* 1919, pp. 177–201, and are arranged on the same plan, all figures of spores being × 600.

Since this enquiry was undertaken with a special view to the study of *Phomopsis,* it will be advisable to summarise here what has been learnt further about the species of that form-genus. It is now known to have three kinds of spores—A-spores (true *Phomopsis* spores) fusoid and averaging 8–9 μ long, on sporophores usually longer than themselves; B-spores (*Phlyctaena* spores) filiform, flexuous or bent more or less like a walking-stick, on very short sporophores; and C-spores (*Fusicoccum* or *Septomyxa* spores) averaging 12–15 μ, fusoid and often shaped like a fish deprived of fins, on long sporophores. Between the first and the last intermediate forms may be observed, but the two are often quite distinct and produced in separate pycnidia. A and B spores have been found in the following additional species:—

Phomopsis Acanthi.
,, *denigrata.*
,, *multipunctata.*
,, *occulta.*

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As regards the delimitation of the species it is plain that, while there is a considerable amount of variety, the A-spores tend to a great uniformity and are in themselves of little use. But the spores as a whole, combined with the variations in external appearance, and in the nature of the *Diaporthe* to which the *Phomopsis* belongs, enable one to delimit the species with fair success. Yet it is also plain that, until the forms of *Phomopsis* are all correlated with their ascophorous stage, it will be necessary in many cases to rely on the host-plant for their identification.

Further, there is sufficient evidence to make it highly probable that the same species can attack any part of the same plant, not only stems and branches, but twigs, petioles, leaves, fruits, and even galls.

Thus such a "species" as *P. petiolorum* (Desm.), supposed to be confined to petioles, is an absurdity which must now be given up. Its various forms must be assigned to one of the species of *Diaporthe* that infest each particular host. A similar statement may be ventured, among others, of *P. glandicola* on acorns, and *P. pteraphila* on ash-keys; as knowledge becomes more accurate, we may expect these to be proved to be forms of some species on oak and ash respectively.

Some authors would take us further still in this simplifying process. It is known to all mycologists that the genus *Diaporthe* was divided by Nitschke and Saccardo into three subgenera:— (1) *Chorostate*, with clustered perithecia, (2) *Euporthe*, with scattered or gregarious perithecia immersed in the wood, and (3) *Tetrastaga*, with similar perithecia immersed in the bark; and it was held by Saccardo that two species belonging to different subgenera were different from one another, even though they occurred on the same host. If, therefore, a *Phomopsis* belonged to a *Euporthe*, it was considered to be different from a *Phomopsis* that belonged to a *Chorostate* or a *Tetrastaga* on the same plant. A good illustration is seen in *P. oncostoma* and *P. Pseudacaciae*, on *Robinia* (see *supra*, p. 179). But if von Höhnel had his way (Annal. Mycol. 1918) all this would be altered, and the three subgenera would be considered to be growth-forms merely. Thus the same species, on the same host, might have a *Chorostate* form, a *Euporthe* form, and a *Tetrastaga* form.

Nor is this the climax. He goes further and considers that, not *genera*, but *families*, should be the biological basis of distinction. Thus all the species of *Diaporthe* (and consequently of *Phomopsis*) on *Sambucus*, *Viburnum*, *Lonicera*, *Symphoricarpus*, and *Leycesteria*, should be classed together under the title *D. spiculosa*, Nits. This is lumping with a vengeance, and probably few would be ready to go so far, without more evidence.

It must be remembered that, with one exception, no cultures of these genera have yet been made. Only let our friends, the petri-dish laboratory culturists, get to work and, judging by what we see in that line to-day, the tendency will be very much the reverse of von Höhnel's. The nine or ten species on Caprifoliaceae, lumped by him under *D. spiculosa*, Nits., would more likely be split up into innumerable biological races. Luckily there is a limit to the capacity of one poor human brain: *medio tutissimus ibis*.

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SPECIES TO BE TRANSFERRED TO PHOMOPSIS.

764. **Phoma acanthina,** *Sacc. & Roum.*

This is now called *Macrophoma acanthina,* Berl. & Vogl. in Syll. Addit. p. 308, and nothing more is known concerning it. It can hardly be doubted that it is a young state of a *Diplodia,* but the only specimen at hand (Roum. Fung. Gall. exs. no. 1020!) shows no sign of becoming so.

But on the same sheet were two specimens of *Phoma Acanthae,* Roum. (Fung. Gall. exs. no. 717) which obtruded themselves at once upon the eye as representing a *Phomopsis,* and on examination turned out to be evidently the same as *Phoma Acanthi,* Sacc. & D. Sacc. (Syll. xviii. 257); they agreed with the description in detail, but showed A and B spores, not A spores only, as Saccardo's did.

PHOMOPSIS ACANTHI, *Grove.*

Phoma Acanthi, Sacc. & D. Sacc. Annal. Mycol. 1905, p. 166.
Phoma Acanthae, Roum. Fung. Gall. exs. no. 717!

Pycnidia gregarious and arranged more or less longitudinally along the stem, occupying partly a large oblong bleached spot, but also extending on to the darkened (rufous-fuscous) parts surrounding it, oblong-lanceolate, 500–750 μ diam., blackish-brown, surrounded by a faint brownish stain, depressed, mouthless or opening irregularly, the apex of each pycnidium where it will open being marked by a pale dot, due to the loosened epidermis. A-spores ellipsoid, about 7 × 2 μ; B-spores about 20 × 0·75 μ, both on short sporophores. (Fig. 1, *a.*)

On dead stems of *Acanthus mollis,* Rome and Perpignan.

Probably the pycnidial stage of *Diaporthe picea* f. *Acanthi* (Sacc. Syll. i. 648). Pycnidia very imperfect, often represented merely by the darkened epidermis. As Saccardo remarks, the pycnidia occur on both the bleached and the darkened portions of the stem.

768. **Phoma Veronicae,** *Roum.*

On this exsiccatum (Roum. Fung. Gall. exs. no. 2960) there are three fungi in the Kew exemplar. The first is that named above, a true *Phoma;* the second is a *Pleospora,* to which doubtless the *Phoma* belongs, and the third is a form of *Phomopsis hysteriola,* which, since that species is not well understood, had better be described here:—

PHOMOPSIS HYSTERIOLA, *Grove.*

f. *Veronicae* nov.

Pycnidia imperfecta, atra, lentiformia vel subglobosa, papillata, in maculis dealbatis singula vel seriata disposita, subter fibrillas ligni nidulantia (corticis partibus et superiore et interiore dilapsis) easque rima singula vel pluribus parallelibus diffindentia, tandem emergentia, halone leviter nigrescente cincta. Sporulae copiosae, lanceolati-ellipsoideae, altero saltem apice acutatae, 1–3-guttulatae, saepius curvatae vel flexae, 6–8 × 2–3 μ, sporophoris subulatis, curvulis, 10–12 μ longis, e strato molli pallide fuligineo oriundis suffultae.

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Hab. in caulibus emortuis *Veronicae spicatae*, Grand Quevilly Galliae (Roum. Fung. Gall. exs. no. 2960!).

This species is distinguished from *P. striaeformis*, Dur. & Mont., under which Saccardo places it, by its occurrence on herbaceous stems where it forms little linear groups, hidden at first under the blackened fibres of the wood, and at length splitting them apart in an hysteriiform fashion. Varieties of the same species occur on *Atropa* and *Chaerophyllum*.

773. **Phoma Marrubii,** *Sacc.*

PHOMOPSIS MARRUBII, *Grove.*

Sphaeronema Marrubii, Dur. & Mont. Flor. Alg. p. 580.

Pycnidia gregarious on bleached spots, black, up to 250 μ diam., imperfect, lens-shaped, depressed, covered by the epidermis, each surrounded by a faint blackish stain and without any pale spot in the centre. Spores oblong-lanceolate, curvulous, acute below, 8–10 × 2·5 μ; sporophores subulate, curvulous, 18–20 × 2 μ, rising from a dusky-olive stratum.

On dry dead stems of *Marrubium vulgare*, Toulouse (Roum. Fung. Gall. exs. no. 2120!).

The bleached spots resemble those of *P. albicans* and *P. hysteriola*, f. *Veronicae*, but the pycnidia are slightly different and in the latter species are differently arranged. The description in Flore d'Algérie is obviously that of a *Phomopsis*, all the external points that distinguish the genus being unconsciously recorded.

778. **Phoma denigrata,** *Desm.*

PHOMOPSIS DENIGRATA, *Trav.* Flor. Ital. Crypt. ii. 230.

Phoma denigrata, Desm. in Ann. Sci. Nat. 1853, xx. 218.

Pycnidia loosely scattered more or less along the entire stem, which is blackened over the whole occupied part, 250–350 μ long, convex, irregular, longitudinally placed, black, immersed, then erumpent by the shining black papilla; pycnidial wall hard and thick above, and sometimes the whole upper part falls away as described in other species, leaving a whitish pit behind. A-spores "fusoid, biguttulate, 10–12 × 3·5–4 μ" (Sacc.): B-spores filiform, curved or hamate, 20–22 × 1 μ, on short ampulliform sporophores: C-spores broadly fusoid or fish-shaped, very acute at both ends, pluriguttulate, 12–15 × 3·5-4 μ; sporophores subulate, curvulous, but never hamate, a little longer than the spore or half as long again, rising from a dusky proliferous stratum. (Fig. 1, *b*.)

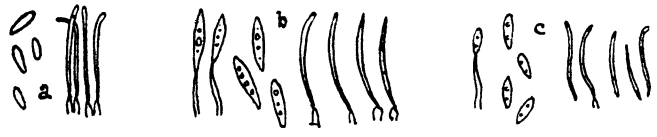


Fig. 1. *a*, *Phomopsis Acanthi*, from *Roum.* no. 717; *b*, B and C spores of *P. denigrata*; *c*, A and B spores of *P. multipunctata*.

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On dead stems of *Prunella vulgaris* (Desm. Crypt. Fr. sér. ii. no. 353!). No doubt the pycnidial stage of *Diaporthe Desmazieri*, Niessl, which sometimes occurs with it. The latter has been found in Britain (*Diaporthe Labiatae*, Cooke in Grevill. v. 63), but the *Phomopsis*-stage has not yet been recorded here.

The same *Phomopsis* was issued by Vestergren (Micromyc. rarior. sel. no. 64!), on stems and leaves of *Prunella grandiflora* in Sweden. Since the leaf-form differs externally somewhat from the stem-form, a description is appended:—

Pycnidia on the fading leaves, epiphyllous, densely scattered, but the leaf is not blackened, round, convex-depressed, 250 μ diam., piercing the epidermis by the papilla, but less prominent than on the stem. The proliferous stratum is much yellower, but all the spores are the same.

B and C spores could be found in abundance in each pycnidium, but no certain A-spores could be found and their description is copied from Saccardo. Desmazières gives the A-spores as "oblong, straight, subfusiform, about 10 × 3 μ"; what Saccardo's description represents is doubtful, perhaps a confusion of A- and C-spores. There seems to be a tendency for the C-spores to become 1-septate.

This species is recorded by Diedicke on *Melampyrum*, *Euphrasia*, and *Odontites*. as well as on *Prunella*.

779. **Phoma multipunctata,** *Sacc.*

Phomopsis multipunctata, *Died.* Annal. Mycol. ix. 26.

Pycnidia crowded, arranged more or less in lines along the stem, oblong, convex, 500–700 μ long, imperfect, very black, covered by the epidermis, then opening by an impressed pore, each pycnidium surrounded by a faint black stain. A-spores elliptic-fusoid or oblong, often acute at one end, but also often obtuse at both ends, bi-tri-guttulate, 6–8 × 1·5–2 μ; sporophores subulate, acute, 10–12 μ long: B-spores filiform, flexuous or hamate, 15–20 (or occasionally 24) × 1–1½ μ, on short sporophores. (Fig. 1, *c*.)

On dead stems of *Lamium album*, Padua (Mycoth. Ven. no. 1545!). *Not* Roum. Fung. Gall. exs. nos. 5274! and 5549! (f. *major*), neither of which at all resembles Saccardo's specimens.

A very typical *Phomopsis*, recognisable as such at a naked-eye view. No doubt the pycnidial stage of *Diaporthe Tulasnei*, Nits. f. *Lamii*; it bears a close resemblance to *Phomopsis Solani*, Grove, which is also possibly a stage of the same *Diaporthe*, but, in view of the total absence of cultural experiments, the external differences are sufficient to justify their separation for the present.

792. **Phoma Spiraeae,** *Desm.*

Phomopsis Spiraeae, *Grove.*

Pycnidia gregarious, arranged longitudinally on the stem, oval, imperfect, shining, black, 250–500 μ long, immersed, not prominent, at length opening by an impressed pore, each surrounded by a brownish halo and sometimes in the midst of an

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effused blackish *Diaporthe*-like stain. Spores oval-oblong or even subcylindric, but often strictly fusoid, mostly acute at both ends, occasionally rounded above, biguttulate, 8–10 × 2·5–3 μ; sporophores subulate, pointed, 12–15 μ long, with a base 2·5–3 μ wide, rising from a dark-olivaceous stratum. (Fig. 2, *a*.)

On dead stems of *Spiraea Aruncus*, France (Desm. Crypt. Fr. sér. i. no. 481!; Roum. Fung. Gall. exs. no. 1109! p.p.). Undoubtedly the spermogone of *Diaporthe Lirella*, Fckl.

When old the upper part of the pycnidium disappears, as often happens in some species of *Phomopsis;* they may then look like an old *Leptostroma*. The sporophores seem to lengthen after they have lost their spore, and look like "paraphyses"; in fact such structures have often been called by that name, both in the Coelomycetes and in the Uredinales. The British specimens on *Spiraea Ulmaria*, Kew Gardens, recorded by Cooke under the name *Phoma Spiraeae*, are mixed with *Leptostroma spiraeinum* Vest. (which Cooke mistook for *Diaporthe Lirella*), but they are certainly not a *Phomopsis*.

823. **Phoma Phytolaccae**, *Berk & Curt.*

Phomopsis Phytolaccae, *Grove*, in *Kew Bull.*, 1917, p. 66.

Septoria phlyctaenoides, Berk. & Curt. in Grevill. iii. 10.

Phlyctaena septorioides, Sacc.

Phlyctaena vagabunda, Desm. f. *Phytolaccae*.

Non *Phoma maculans*, Cooke, in Herb. in *Phytolacca decandra*, Marseilles.

Pycnidia densely scattered, situated beneath the bleached epidermis, oblong-hysteriiform with an impressed pore, or subglobose-depressed with occasionally a small papilla, at length erumpent by the vertex, black, up to 400 or 500 μ long. A-spores fusoid, more tapering below, bi-tri-guttulate, 9–10 μ long; sporophores subulate, a little longer than the spore. (Fig. 2, *b*.)

On dead stems of *Phytolacca*, New Jersey (Herb. Berk. no. 4702!). It has been suggested that this is the pycnidial stage of *Diaporthe aculeata*, Sacc., but see below.

The description is taken from Berkeley's original specimens. Berkeley noted at the time the resemblance of the spores to those of *Phoma pallens*, Berk. & Curt., which of course was merely the result of their being congeneric (See p. 184, *supra*).

On other specimens of this fungus (Ell. & Ev. North Am. Fung. ser 2, nos. 2552! and 2939!) equally from New Jersey, both B and C spores, in addition to the A-spores, occur abundantly as described below. It is worthy of notice that here again all attempts to find the three kinds of spores in the same pycnidium failed; A and B, B and C, as well as A and C spores could be found together, but not A, B, and C. This may depend upon the production of the spores at different periods of the life-history of the fungus, though this supposition does not entirely explain the matter.

The sketch given here, showing A and C spores growing side by side, can be exactly paralleled by one made by Berkeley on the sheet of his specimens of *Phoma mixta* on *Datura* (see p. 186, *supra*) as long ago as 1873, which shows accurately A and B spores

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both rising from the same hymenium—a remarkable fact considering the time when it was done.

B-spores filiform, flexuous or mostly hamate, 22–25 × 0·5–0·75 μ, on very short sporophores.

C-spores fusoid or fish-shaped, acute at both ends, pluriguttulate, 12–15 × 2·5–3·5 μ, on sporophores varying from about as long to half as long again. (Fig. 2, *b*.)

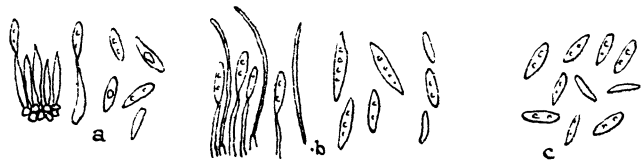


Fig. 2. *a, Phomopsis Spiraeae*; *b*, A, B, and C spores of *P. Phytolaccae*; *c, P. atriplicina.*

The shape of the C-spores resembles that of a fish from which all the fins have been removed. If they stood alone they would pass for a *Fusicoccum*, as in *Diaporthe leiphaemia*, Sacc. But, in some pycnidia, every possible length of spore between 10 and 15 μ could be found, although A and C spores were usually separated.

It will be noted that Berkeley describes the pycnidia of his *Septoria phlyctaenoides* (l.c.) as "hysteriiform"; such pycnidia do occur on the same stems side by side with the lens-shaped papillate pycnidia, but on examination both kinds were found to contain exactly similar spores. Saccardo notes (Syll. iii. 139) the presence of two kinds of spores (A and C), just as Berkeley did of the A and B spores on *Datura*, but in both cases without realising their significance.

Since *Diaporthe* (*Eu.*) *aculeata* (Schwein.) is common in the same region as the *Phomopsis*, and occurs with it, they are probably connected, though this would contradict the theory expressed *supra*, p. 179.

830. **Phoma atriplicina**, *Westd.*

PHOMOPSIS ATRIPLICINA, *Grove.*

Pycnidia gregarious, arranged more or less longitudinally on the stem, oval-oblong, 300–500 μ long, convex, black, covered by the blackened epidermis which is at length pierced by the small black papilla; when mature the blackened epidermis forms a halo round the pycnidium, finally the whole of the upper part falls away and leaves a dingy-white pit. Spores fusoid, acute at both ends, biguttulate, 8–9 × 2·5 μ; sporophores subulate, 12–20 μ long. (Fig. 2, *c*.)

On stems of *Atriplex hortensis*, Belgium (Westd. Herb. Crypt. Belg. no. 1233!).

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On stems of *Kochia prostrata* there is f. *Kochiae* (Roum. Fung. Sel. Gall. no. 514!) mixed with other fungi, notably *Camarosporium Roumegueri*, var. *Kochiae*, Sacc. But Roum. Fung. Gall. exs. no. 859!, and Fung. Sel. Gall. exs. no. 214! are both quite different, though under the same name.

Diedicke seems to regard a *Phomopsis* on *Atriplex* as belonging to *Diaporthe picea*, Sacc.

835. **Phoma macropyrenia**,, *Thüm.*

On the Kew exemplar of Thümen's exsiccatum, named in his writing "*Phoma macropyrenium*, Thüm. nov. spec.," are three fungi, all black and all somewhat similar, intermingled, but differing from one another in the character of the spores and sporophores.

The first is that intended by Thümen, a true *Phoma*, having an all-round pycnidium with a wall about one cell thick.

I.—Phoma macropyrenia, *Thüm.*

Pycnidia gregarious, immersed, covered by the epidermis, then erumpent, subsuperficial, globose, about 100 μ diam., black, pierced at the vertex by a minute impressed pore; texture truly *Phoma*-like, brown, parenchymatous. Spores ellipsoid, oblong, or subcylindrical, rounded and scarcely subacute at both ends, at times somewhat curvulous, 6–8 × 2·5–3 μ (or rarely 10 μ long), rather variable, and having, apparently, in many cases, as Thümen says, "two large nuclei," *i.e.* guttules, one at each end. On closer examination, however, it is seen that this appearance is caused by what Berkeley used to call "a retraction of the protoplasm to either end," leaving a kind of vacuole in the middle. No perceptible sporophores: one spore was seen which appeared to have a median septum. (Fig. 3, *a*.)

On dead stems of *Ricinus communis*, Coimbra, Portugal, legit Moller (one of the original specimens issued by de Thümen in *Flora lusitanica*).

The specimens issued by Roumeguère under the same name (in Fung. Gall. sel. no. 4349!), from Luchon, are quite different.

The second fungus is a *Phomopsis*, which is different from *Phomopsis Ricini* described below; it may belong to *Diaporthe spiculosa*, var. *Ricini*, Trav. (Flor. Ital. Crypt. Fung. ii. 244) which should, it seems, be considered distinct from *D. spiculosa*, Nits.

II.—Phomopsis praetervisa, sp. nov.

Pycnidia copiosa, subgregaria, nec conferta, atra, rotundata, apice pertusa, interdum confluentia, ca. 250 μ diam., velata, dein erumpentia, denique parte superiore crassa dilapsa discum incusum atrum opacum epidermide fracta cinctum relinquentia. Sporulae copiosae, cylindraceo-ellipsoideae vel fusoideae, utrinque subacutae, 1–2-parviguttulatae, 8–10 × 2–2·5 μ, sporophoris stipatis, subulatis, erectis, achrois, apice saepe acutis, 16–20 × 1·5–2 μ, e strato dilute olivaceo oriundis suffultae. (Fig. 3, *b*.)

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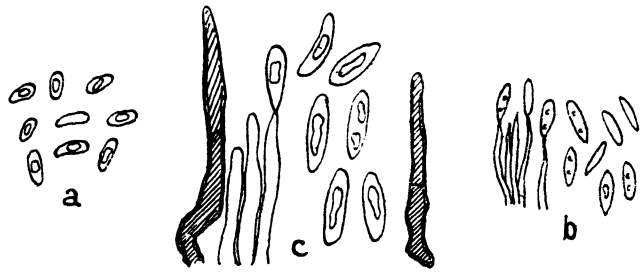


Fig. 3. *a, Phoma macropyrenia*; *b, Phomopsis praetervisa*; *c, Colletotrichum*, all from Moller's specimen.

Hab. ibidem. The " perithecia " described by Thümen seem to be a confusion of these two species.

This *Phomopsis* differs from *P. Ricini*, Gr. in (1) the epidermis not blackened over the pycnidium, (2) each not being surrounded by a black stain, (3) the upper part falling away and leaving a disc (*see* below, p. 437).

III.—The third fungus, which is small in quantity, is a *Colletotrichum*, very like *C. gloeosporoides*, Penz. or *C. Malvarum*, Southw. It has spores longer and more cylindric than those of the two just described, 14–18 × 4–4·5 μ, filled with granular protoplasm, and provided occasionally with an irregular guttule: the sporophores are pale-brownish, oblong, crowded, obtuse at apex, 20–35 × 3–4 μ, rising from a thick soft yellowish-brown stratum of minute parenchymatous cells. The proliferous stratum is surrounded by a small number (15–20) of inconspicuous brown hairs of the usual kind, 40–60 μ long. (Fig. 3, *c*.)

836. **Phoma Euphorbiae,** *Sacc.*

Phomopsis Euphorbiae, *Trav.* l.c. p. 233.

Pycnidia occupying little oblong-sinuous dark-grey (not black) areas of the stem, covered by the epidermis, greyish-black, about 180 μ diam. Spores oblong-ellipsoid, rather obtuse at both ends, often biguttulate, 6–7 × 2–2·5 μ; sporophores crowded, acicular, 12–14 × 1·5 μ.

On stems of *Euphorbia Characias*, Collioure, France (Roum. Fung. Gall. exs. no. 1105!). On stems of *Euphorbia palustris*, Birmingham. The pycnidial stage of *Diaporthe Euphorbiae*, Cooke.

871. **Phoma lathyrina,** *Sacc.*

Phomopsis lathyrina, *Grove.*

Pycnidia gregarious, orbicular, convex or globose-depressed, covered but rather prominent, black, somewhat shining, up to 400 μ diam., surrounded by a dull blackish halo, and sometimes two or three enclosed by a sinuous *Diaporthe*-like line, at length dropping out and leaving a paler pit; texture thick above, blackish-brown. Spores oblong-ellipsoid, subobtuse at both ends, often biguttulate, sometimes inequilateral, 8–10 × 2–2·5 μ;

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sporophores crowded, erect, acicular, 16–20 × 1–1·5 μ, rising from a thick brownish stratum.

On dead pods of *Lathyrus silvestris*, Padua (Mycoth. Venet. no. 1542!).

A true *Phomopsis*, but no *Diaporthe* on *Lathyrus* seems to be known. The halo is due to dark creeping fibres. Cf. *Diaporthe inaequalis*, Nits.

893. **Phoma occulta**, *Sacc.*; and 894. **Phoma conorum**, *Sacc.*

The investigation of the specimens placed under these heads disclosed a "Comedy of Errors" which took a considerable time to unravel. Westendorp published, in Herb. Crypt. Bot. Belg. no. 913!, under the name "*Sphaeria conorum*; Desm.," a species on cone-scales of *Picea excelsa* which was not that of Desmazières, but was *Diaporthe occulta*, (Fckl.) Nits. This error was discovered by Niessl, who pointed out (in Hedwig. 1876, p. 1) that Desmazières' species was on cones of Pine and was stated by him (Ann. Sci. Nat. 1846, xvi. 76) to have ascospores measuring 8·3 μ long, while the specimens of Westendorp, Niessl said, had spores 12 μ long or more.

This correction, however, made matters worse. An examination of the Kew example of Desmazières' own co-type exsiccatum (*Sphaeria conorum*, Desm. Crypt. Fr. no. 1773!, on the rhomboidal apophysis of cone-scales of *Pinus silvestris*) shows that it possesses well-developed asci containing spores that measure 12–14 μ long, and are therefore practically indistinguishable from those of *D. occulta*. But the same exsiccatum also contains, glued on the paper by Desmazières, other scales on which were spermogones, with spores measuring about 8 × 3 μ. These are what should rightly be called *Phomopsis conorum*; evidently Desmazières gave the length of these pycnidial spores instead of that of the ascospores.

Saccardo, taking Niessl's word for it, introduced this mistake into the Sylloge (i. 647), and thus misled later mycologists. So when Muller found at Eastbourne a *Diaporthe* on cone-scales of Pine, having spores 12–14 × 4 μ, it was of course concluded by Cooke that this was *D. occulta*, instead of being as it is, *D. conorum*; so far, ascophorous *D. occulta* has not been noticed in Britain, although the late Dr. J. W. Ellis discovered the *Phomopsis*-stage at Malvern and Dolgelley.

The description of *D. occulta* in Saccardo (p. 647), taken from Nitschke, is, like all that Nitschke wrote, very accurate and complete; but as that of *D. conorum* (*ibid.*) is incorrect, a description taken from Desmazières' specimens is given below. It appears that, though the spores are so similar, the fungi differ much in outward appearance, as well as in host.

DIAPORTHE CONORUM (*Desm.*).

Stromata 3–5 mm. across, angular, distinctly limited, usually deep-black and shining outside; within, the matrix is undiscoloured but bordered by a black line. Perithecia globose, about 250 μ diam., gregarious, immersed and at first hidden, but at length bursting the epidermis and protruding slightly, showing

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a short black papilla surrounded by an erect collar. Asci about 45 × 8 μ; spores biseriate, fusoid, subacute at both ends, 4-guttulate, 12–14 × 3·5–4 μ, remaining for a long time eseptate.

On the apophysis of the cone-scales of *Pinus silvestris* (Desm. Crypt. Fr. no. 1773!).

Distinguished at once from the fully developed state of *D. occulta* by the absence of the long cylindrical ostioles of the latter; in *D. occulta* the stroma is outwardly brownish-black and opaque; in *D. conorum* it is mostly shining and inky-black—in both it is bounded within by a narrow black line. The difference of host seems, so far as known, to be constant, but that question must be left for the future to decide.

Let us assume that it is constant. Then it is plain that *Phoma conorum*, Sacc. (Syll. iii. 150), since it is on "*Abies*," is not the spermogone of *Diaporthe conorum* (Desm.), as Saccardo asserts. Moreover it does not agree with Desmazières' own exsiccatum, named "*Sphaeria conorum*, Desm." It is really one of the spore-forms of *Phomopsis occulta*, Trav. (see below).

Of *Phomopsis conorum* (Desm.) ? Died. not enough was found to justify description at present, except that the spores are ellipsoid and measure 8–9 × 2·5–3 μ. Of *Phomopsis occulta* Trav. three spore-forms were seen.

PHOMOPSIS OCCULTA, *Trav.* l.c. p. 221.

A-spores—Pycnidia roundish or more often oblong, 200–250 μ long, black, imperfect, immersed, convex, then bursting the epidermis above for the most part in an hysteriiform manner, often arranged more or less in lines; texture rather thick above; the epidermis all round is faintly stained with blackish longitudinal streaks. Spores numerous, narrow-oblong, somewhat sausage-shaped, curved in profile view, rounded above, obliquely apiculate below, at times faintly biguttulate, 9–10 μ, then 10–13 × 2–2·5 μ, when mature; sporophores crowded, filiform, acute at apex, usually straight, 12–15 × 1–1·5 μ, rising from a soft brownish stratum.

On outer surface of cone-scales of *Picea excelsa*, at the tip, Nannau Park, Dolgelley (Ellis). (Fig. 4, *a*.)

Except that the spores are longer (? more mature), these specimens are much like those described by Fuckel (Nachtr. iii. 23). He did not issue any dried specimens of the spermogones, but observes that they occurred on the outside of the scales, on the same stroma which, on the inside, produced the ascophorous perithecia.

Here it should be noted that Fuckel (? in error) records (Symb. Myc. p. 210) the host of his *Valsa occulta* (Fung. Rhen. no. 622) as *Pinus excelsa*, whereas the scales in the exsiccatum are obviously those of *Picea excelsa*, or as he calls it thereon "*Pinus Abies*."

Those who have to examine the exsiccata issued by Roumeguère are aware that they are very disappointing, being frequently badly named and often deficient in quantity. But in this case it was decidedly different, for his exsiccatum no. 1727, under the name "*Phoma* (*Diaporthe*) *conorum*, Sacc. *Sphaeria* Desm.

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West. H. C. no. 913," which is on "*Abies*," surprisingly yielded both the B and C spores of *D. occulta*.

B-spores—Pycnidia gregarious, immersed, thick-walled above, convex, black, erumpent in short hysteriiform groups. Spores numerous, filiform, but thickened subclavately upwards, falcate or hamate, obtuse at apex, much attenuated below, pluriguttulate in the upper half, 32–40 × 2 μ at the widest part; sporophores short, papilliform, rising from a thick soft pale-brownish stratum. (Fig. 4, *b*.)



Fig. 4. *a*, A-spores; *b*, B-spores; *c*, C-spores of *Phomopsis occulta*; *d*, *Phomopsis Ricini*.

The same exsiccatum (Fung. Gall. exs. no. 1727!), as well as *ibid.* no. 1735! (under the name "*Phoma strobilina*, Desm. Pl. Cr. Fr. 1876") on the same host, yielded the C-spores.

C-spores—Pycnidia imperfect or rather with no evident pycnidial wall, convex, irregular, for the most part appearing mouthless, black, rugulose, often erumpent in an hysteriiform manner, surrounded by the laciniae of the epidermis. Spores fusoid, fish or torpedo-shaped, acute at both ends, with one or more guttules, 10–14 × 2–3 μ; sporophores acicular, 10–15 × 1 μ, rising from a thick brownish stratum. (Fig. 4, *c*.)

It will be noticed that these spores are exactly what Saccardo describes for his *Phoma conorum* (Syll. iii. 150); his "basidia uncinata, 24 × 1 μ" are no doubt the B-spores, though they seem more like the usual B-spores of a *Phomopsis* than the unusual ones described above. Perhaps both kinds occur. The C-spores are flattened, as if cut out of thick cardboard, so that in profile they look distinctly narrower, and are often curved; in face-view they might sometimes almost be described as "coffin-shaped." There was no true pycnidium: the black mass seemed to be composed entirely of spores.

It was observed that all three kinds tend to occur in short lines, and often burst the epidermis rimosely, exactly as the ascophorous stage of *D. occulta* does at times.

SPECIES TO BE TRANSFERRED TO DIPLODIEAE.

834. **Phoma Ricini,** *Sacc.*

Sphaeropsis Ricini, Cooke in Grevill. xii. 23.

Macrophoma Ricini, Berl. & Vogl. in Syll. Addit. p. 308.

? *Diplodia Ricini*, Sacc. & Roum. in Rev. Mycol. iii. 29. Syll. iii. 369.

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Pycnidia densely scattered, subglobose, more or less depressed, black, covered by the epidermis, then erumpent by a small papilla, at length nearly free, up to 250 μ diam.; texture thick, *Diplodia*-like. Spores elongate-ellipsoid or subfusoid, always colourless, cloudy within, continuous, 15–23 × 5–5·5 μ. (Fig. 5, *a*.)

On stems of *Ricinus communis*, Aiken, South Carolina (Ravenel, Fung. Amer. exs. no. 543!, and Cooke, Fung. North Amer. no. 2630!).

In all these specimens the spores are in length very variable (some only 13 μ long, others reaching even 30 μ) though remaining constant in width; they are colourless, but evidently not mature, and all continuous except that in one a faint median septum could be discerned. They are closely similar to those previously treated of under the names *Phoma fusigera* and *P. fusispora* (see *supra*, pp. 191–3), and like them are strongly reminiscent of a *Diplodia*. They must all stand or fall together; in this case the *Diplodia* is probably *D. Ricini*, Sacc. & Roum., but no specimen of this was at hand for comparison.

But on the same sheet of one of Ravenel's specimens, and on the same stem which contains the "*Sphaeropsis*" just referred to, is a very different fungus:—

PHOMOPSIS RICINI, sp. nov.

Pycnidia dense gregaria, rotundata, convexa, ca. 200 μ diam., atra, epidermide obscurata tecta, halone nigrescente cincta, tandem ostiolo emergentia; contextu partis superioris crasso, atro-brunneo. Sporulae fusoideae, utrinque subacutae, biguttulatae, 7–9 × 1·5–2 μ, sporophoris subulatis, acutis, achrois, 12–15 μ longis, deorsum 3 μ latis, e strato crasso atro-olivaceo oriundis suffultae. (Fig. 4, *d*.)

Hab. in stipite emortuo *Ricini communis*, Aiken Carolinae australis. It may be conjectured that this is the pycnidial stage of the South American *Diaporthe Ricini*, Speg.

872. **Phoma Triacanthi,** *Sacc.*

Sphaeropsis Gleditschiae, Cooke in Grevill. vi. 134 (non *Thüm.*).

Macrophoma Triacanthi, Berl. & Vogl. in Syll. Addit. p. 310.

On the sheet bearing this name are two different fungi, but probably both belonging to the same life-cycle. The first, which is that intended by Cooke, shall be described as:—

I.—DOTHIORELLA GLEDITSCHIAE, *Grove*.

Sphaeropsis Gleditschiae, Cooke.

Pycnidia compound, forming a roundish or angular erumpent mass, 300–500 μ diam., black, convex, with a thick texture of minute dark-brown parenchymatous cells; cavity divided into several pseudo-locelli by paler translucent walls. Spores quite cylindrical, obtuse at both ends or faintly acute below, straight, hyaline; sporophores similar to the spores, but shorter. (Fig. 5, *b*.)

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On legumes of *Gleditschia Triacanthos*, Aiken, South Carolina (Ravenel, nos. 250! and 2330!).

Probably a stage of the *Botryodiplodia* referred to below. See Journ. Bot. 1918, p. 294, and *Kew Bull. supra*, p. 188.

The other fungus, on the same sheet, shall be described as:—

II.—Haplosporella Gleditschiae, sp. nov.

Pycnidia in greges erumpentes confluentesque digesta, quandoque longitudinaliter seriata, atrobrunnea, ca. 300 μ lata, peridermio laciniato margine pallidiore cincta, contextu crasso parenchymatico conflata. Sporulae oblongae, utrinque rotundatae, continuae, dilute olivaceo-brunneae, plerumque 1–2-guttulatae, 16–22 × 6–10 μ, sporophoris diplodioideis, oblongis, erectis, fasciculatis, achrois, apice obtusis, ca. 30 × 9 μ suffultae. (Fig. 5, *c*.)

Hab. in ramulis *Gleditschiae Triacanthi* (Ravenel, no. 2380!) et in ejusdem leguminibus (Rav. no. 2347!), Aiken Carolinae australis.

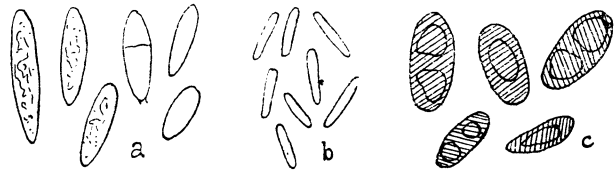


Fig. 5. *a, Sphaeropsis Ricini*, Cooke; *b, Dothiorella Gleditschiae*; *c, Haplosporella Gleditschiae.*

This cannot possibly be anything else than a young state of a *Botryodiplodia*, before the septum is developed, being exactly in the same condition as the British species which have been named *Haplosporella melogrammata*, *H. viticola*, and *H. caespitosa* (all known to be the mere states of species of *Botryodiplodia*). It is probably, therefore, = *Botryodiplodia Gleditschiae* Berl. (Sacc. Syll. x. 294), but since no specimens of that were at hand for comparison, it is recorded here under an *ad interim* name. There is every reason to believe also that the *Botryodiplodia* is a congested state of *Diplodia Gleditschiae*, Pass. (Syll. iii. 335), with *D. macrostoma*, Lév. (Syll. iii. 350) f. *Gleditschiae* as an intermediate form.

With regard to these names which are admittedly *ad interim*, pending the results of cultures to be carried out by the younger generation, it may be remarked that, so long as they are recognised to be what they are, they are a help rather than a hindrance. For many of these Imperfect Fungi occur so widely and so persistently in the unfinished state that, if no definite reference is made to that state, one who is not expert in the subject may easily go astray. It seems, therefore, a mere common-sense business precaution to list them under the preliminary name, always of course with cross-references as in a library catalogue. This does no harm except in the minds of believers in the sacrosanctity of Linnean binomials. We do not call the " fruit of an oak-tree " by that name, but " an acorn."

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SPECIES TO BE TRANSFERRED TO HYALODIDYMAE.

831. **Phoma Rheea,** *Cooke.*

ASCOCHYTA RHEAE, *Grove.*

Pycnidia scattered, round, covered by the epidermis, then emergent by the upper half, about 300 μ diam., blackish, at length falling away and leaving a little white pit; texture thin, soft, plectenchymatous, brown. Spores oblong-ellipsoid, somewhat obtuse at the ends, biguttulate, for a long time continuous, at length 1-septate, not constricted, 7–9 × 3–3·5 μ; sporophores about as long as the spore.

On dead stems of *Boehmeria nivea,* Assam and Kew Gardens.

The British specimens correspond exactly with those from Assam, no doubt having been introduced with the plant. Only a few of the spores were distinctly 1-septate, but many showed indications of becoming so. This species might be placed in *Diplodina,* but it has the pycnidial texture of an *Ascochyta*; the distinction between the two genera should lie in the texture of the wall of the pycnidium, not in the nature of the habitat.

884. **Phoma cucurbitalis,** *Berk. & Curt.*

Spots none. Pycnidia gregarious, subglobose, flattened, erumpent and at length somewhat superficial, black, shining, about 100 μ diam., with a minute ostiole in the centre; texture of brown polyhedral cells, truly *Phoma*-like. Spores ovoid, rounded at the ends, biguttulate, 5–7 × 2–2·5 μ; sporophores obsolete.

On seeds of *Citrullus,* South Carolina (Herb. Berk. no. 5033!).

Though all the spores seen were continuous, there were not wanting indications (as by the constriction of numerous spores in the middle) that they would ultimately become 1-septate. The species would then belong to the genus *Diplodina.*

SPECIES TO BE TRANSFERRED TO LEPTOSTROMACEAE.

842. **Phoma hysteriiformis,** *Cooke.*

Pycnidia black, up to 500 μ long, densely gregarious and frequently confluent, forming an elongated *Hysterium*-like tubercle; mycelium arising in the epidermal cells, covered at last only by their outer walls, but penetrating deeply into the mesophyll, composed of thick-walled dark-brown parenchymatous cells, somewhat radiating at the margin, enclosing a cavity which is lined by the sporophores above and below. Spores more or less ellipsoid, obtuse at both ends, colourless, cloudy within, 12–14 × 4–6 μ; sporophores short, oblong, erect, obtuse at apex, pale brownish, sometimes transversely septate below, reminding one of those of *Piggotia astroidea,* B. & Br. (Fig. 6, *a.*)

On an herbaceous stem, Houston, Texas, legit Ravenel (Cooke, North Amer. Fung. no. 224!).

Externally very like the less crowded specimens of *Placosphaeria Onobrychidis,* var. *anaxaea* (Speg.) Keissl., as issued by

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Keissler, but not like the description of *Phoma anaxaea*, Speg. (Syll. iii. 121) to which he assigns it, but of which, it is true, neither Keissler nor I have seen a specimen. Saccardo seems to be in error in regarding the latter as the spermogone of a *Diaporthe*. The fungus is also somewhat similar to specimens of *Placosphaeria Balanseana*, Sacc. & Roum. (Syll. x. 237), in external appearance. But since each stroma contains only one spore-bearing cavity, it must belong rather to the Leptostromaceae: *Placosphaeria* has numerous dothideoid cavities in each stroma, though I believe that it is more akin to the Leptostromaceae, than to the Sphaerioideae where Saccardo places it.

In view, however, of the confusion in which the Leptostromaceae now stand, with the generic limits perfectly undefined, it is useless to assign the present species to a genus. The whole group requires thorough re-examination, a long and arduous task. Thus under *Leptostroma herbarum*, Fr., we find placed by various authors species presenting at least three or four types of pycnidium, nor can these be disentangled by any other means than by examining their vertical sections.

It is known that some *Leptostromaceae* arise *between* the cuticle and the epidermal cells, others arise *within* the epidermal cells, which they ultimately destroy. The process by which the stroma arose in the present species could be clearly followed. The purplish-brown hypha starts in a single epidermal cell, branches and fills that cell with pseudo-parenchyma, then grows through the pits into the neighbouring cells, where it again branches and continues the process. Finally there is produced a cluster of epidermal cells of which the lateral walls are completely destroyed, while the mycelium also penetrates deeply into the mesophyll. Then the cuticle is burst, and round the free margin the hyphae grow outwards in a somewhat radiating fashion. Meanwhile a cavity arises in the stromatic mass, round the inside of which erect hyphae (conidiophores) produce the spores, which finally escape through a hole formed at the apex of the mass. The structure exactly resembles that of Diedicke's § A, as described for *Leptostroma Equiseti*, Jaap, and figured in his article *Die Leptostromaceen* (Annal. Mycol. 1913, xi. 177, f. 3). The name of this fungus should then be *Leptostroma hysteriiforme*, but it opens by a pore, not a slit, and therefore does not belong to *Leptostroma* in Saccardo's sense, but to *Leptothyrium*.

SPECIES TO BE TRANSFERRED TO GLOEOSPORIUM.

883. **Phoma lagenicola**, *Sacc.*

GLOEOSPORIUM LAGENARIAE, *Grove.*

Phoma Lagenariae, Thüm. in Contr. Myc. Flor. Lusit. ser. iii. no. 567 (1880), *non* Sacc.

There are in the Herbarium on *Lagenaria* fruits a number of specimens on which the name "*Phoma Lagenariae*, Cooke" has been written. These on examination yield numerous spores, which are evidently those of a *Gloeosporium;* there is no trace

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of any pycnidial wall. The spores measure 5–6 × 2–2·5 μ, although occasional ones reach as high as 8·5 μ long. They are all obviously the same, and agree excellently well with the description of *Phoma Lagenariae*, Thüm., of which there are unfortunately no specimens for comparison. Saccardo, who also had not seen specimens, lists Thümen's species under the name *P. lagenicola.*

The following is the description of Cooke's specimens, named "*Phoma Lagenariae*," Cooke in Herb.

Spots up to 2 cm. across, roundish or (if contiguous) angular, greyish-ferruginous, with a darker border. Pustules densely gregarious, subepidermal, 200–250 μ diam., blackish, paler in the centre where the epidermis at length bursts open. Spores ovoid or oblong, hyaline, continuous, 5–6 × 2–2·5 μ, rarely longer, usually rounded at the ends, often with one or more guttules; sporophores subulate-acicular, acute, crowded, 20–25 × 1·5 μ, rising from a faintly brownish stratum. (Fig. 6, *b*.)

On epicarp of *Lagenaria vulgaris*, Marseilles, 1873, no. 55!

There is no indication by whom it was sent to Cooke, but the writing is distinctly French. If, as seems hardly in the slightest degree doubtful, it is identical with Thümen's species, its name according to the rules must be *Gloesporium Lagenariae*; it does not agree with any other described. There are no setae visible. Thümen's species was gathered by Moller in 1879.

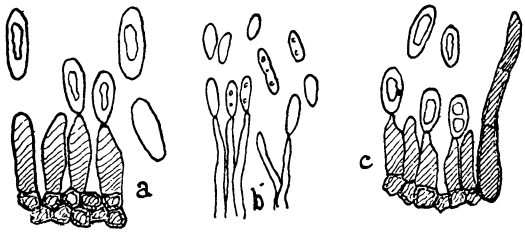


Fig. 6. *a*, "*Phoma hysteriiformis*"; *b*, "*Phoma lagenicola*", from Marseilles; *c*, *Colletotrichum Janiphae.*

It may here be mentioned that, though no specimens have been seen, *Phoma Lagenariae*, Sacc. (Syll. iii. 148) (*Sphaeropsis Lagenariae*, Thüm.) is according to the description merely a young state of some *Diplodia*, and the same guess might be hazarded for *Phoma Citrulli*, Berk. & Curt., and for *Phoma seminalis*, Sacc.; in fact all three may be the same species. But, to show the danger of such methods, it should be noticed that, in the same way, and apparently on equally good grounds, one might have conjectured that *Phoma Lagenariae*, Cooke was the same as *Phoma cucurbitalis*, Berk. & Curt., and this conjecture would have been wrong.

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SPECIES TO BE TRANSFERRED TO COLLETOTRICHUM.

833. **Phoma Janiphae,** *Sacc.*

COLLETOTRICHUM JANIPHAE, *Grove.*

Sphaeropsis Janiphae, Thüm. in Flora, 1878, p. 179.

Macrophoma Janiphae, Berl. & Vogl. in Syll. Addit. p. 307.

Pustules densely gregarious, very numerous, sub-epidermal, black, paler in the centre, roundish or subangular, nearly flat, usually 150–180 μ diam., each with a few (20–25) blackish bristles arranged round the periphery or rarely scattered over the disc; bristles short, curved or straight, tapering slightly upwards, rarely septate, dark olivaceous-brown, 30–40 μ long. Spores oval or oblong, rounded at both ends, with one or more guttules, quite hyaline, 10–13 × 4–5 μ; sporophores erect, fasciculate, oblong, cuspidate at apex, pale-brown, 12–14 × 4–5 μ. (Fig. 6, *c.*)

On dead stems of *Jatropha Janipha* (*Manihot carthaginensis*), Aiken, South Carolina (Thüm. Mycoth. univ. no. 1191!), legit Ravenel.

The black *Phoma*-like appearance, which Thümen so mistakenly describes, is due to the coloured sporophores and subhymenium; the black margin is due to the bristles. When the epidermis is raised in the centre, it shows as a whitish dot on the black pustule, and ultimately bursts at that point. When the pustule is older, the disc becomes quite pale, but is still surrounded by a narrow black border due to the bristles.

Roumeguère (Fung. Gall. exs. no. 718!) issued a similar fungus, from Collioure, in France, which shows pustules of two sizes. The larger appear to be merely an immature state of the *Colletotrichum,* before the bristles are developed or the spores have reached their proper shape and size. But what the smaller are, unless they are the same thing in a still earlier state (as seems probable), I do not care to pronounce: they have spores, some about 5 × 3 μ, as Saccardo says (f. *microspora,* Syll. 141), but they are very variable, usually a sign of immaturity.

In a paper, which it is hoped will soon be published in this Bulletin, I have shown that *Colletotrichum* and *Vermicularia* should be kept as two distinct genera of Melanconiales, separated by the fact that in *Vermicularia* the bristles are the most conspicuous part and are often well-developed before the spores appear; while in *Colletotrichum* the reverse is the case, the bristles being as it were an afterthought, developed only as the pustule matures, so that fully-formed spores are often plentifully produced before a single bristle can be detected.

A few other species, listed by Saccardo, may now be more briefly referred to:—

841. **Phoma irregularis,** *Sacc.*

Sphaeropsis irregularis, Berk. & Curt. Cub. Fung. no. 563.

This name should be dropped: the type specimen (Herb. Berk.

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no. 789!) yielded various irregular spores, but none like those described. Berkeley sketched some "spores" on the sheet, it is true, from which the account may be taken, but they do not look like real spores, and in the absence of all knowledge of the host the fungus can never be recognised again.

853. **Phoma minutissima,** *Cooke.*

Asteroma Liatridis, Berk. & Curt. in Herb.

This specimen, on leaves of *Liatris odoratissima,* South Carolina (*Ravenel,* no. 1920!), consists of a dematioid mycelium, chiefly on the upper side of the leaf, forming greyish-black oblong or oval patches, 10–11 mm. across, often confluent into large irregular blotches and dotted over with innumerable little black lumps of mycelium which are the beginnings of pycnidia or perithecia, but in which no spores could be found anywhere, although there is ample material. It cannot be recognised unless one should find it again, with the same external facies and on the same host, in a more advanced state. Meanwhile, if it is worth keeping in memory, *Asteroma Liatridis* B. & C. is the correct name: it is certainly no *Phoma.*

861. **Phoma Violae,** *Westd.*

The pycnidia in Westd. Crypt. Belg. no. 525! on examination are seen to be situated in sori of *Puccinia Violae* containing both uredo and teleutospores. They have exactly the same structure and texture as *Darluca Filum,* Cast., but produced no real spores, though the contents appear to be what Westendorp described as "spores." The fungus is evidently the *Darluca,* immature, and with the cavity filled with subsclerotioid tissue.

895. **Phoma arctica,** *Sacc.*

Sphaeropsis arctica, Berk. & Curt. in Proc. Amer. Acad. Arts, Sci. iv. 1858, p. 125, no. 124.

Pycnidia few, scattered, erumpent, convex, black, irregular in shape, often compressed. Spores numerous, fusoid, acute at both ends, hyaline, often biguttulate, straight in front view, curved and narrower in profile, 10–12·5 × 1–2 μ; sporophores straight, linear, hyaline, 7–8 μ long.

On outer surface of cone-scales of *Picea ajanensis,* Fisch. ex Trautvetter & Meyer. Kamtchatka (Herb. Berk.). The host was wrongly given in the original description as "*Pinus ajanensis.*"

Neither a true *Phoma,* nor a *Phomopsis.* Pycnidial wall minutely parenchymatous, opening in the upper half. It is most likely that this is a form or variety of *Sporonema strobilinum,* Desm., the spores being very similar to those of that species. But the material is too small in quantity for perfect certainty.

903. **Phoma brunneotincta,** *Berk. & Curt.*

Berkeley gave the name *Phoma brunneotincta* to specimens in his herbarium on a Sweet Chestnut (*Castanea*) from New England. Cooke gave the same name to a fungus which grew on the inside of a dead husk of Horse Chestnut (*Aesculus*) in Kew Gardens,

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thinking they were the same. But the Kew specimens are a *Phomopsis*, and probably identical with one of the species known to occur on *Aesculus*. Since Berkeley's New England specimen is very small in quantity, and he seems to have published no description, while Cooke's description in Grevillea (xvii. 42) is apparently a compound of the two sets of specimens (for its spores are not those of the Kew fungus), it would be better to drop the name altogether.

In the vain endeavour to decide to which of the species of *Diaporthe* on *Aesculus* the Kew fungus should be assigned, it was thought well to examine *D. aesculicola*, Cooke, *D. Hippocastani*, Cooke, and *Cryptospora Aesculi*, Fckl. The examination showed clearly that these three species, which were represented by authentic specimens, are all identical. All three are accompanied by *Septomyxa Aesculi*, Sacc., the C-spores of the *Diaporthe;* but in the first the ascophorous stage predominates, in the second the pycnidial stage, and so they present different aspects by which Cooke was misled, while Fuckel's is merely the young state before the septum of the ascospores is developed. The species should be called *D. Hippocastani* (Cooke), since that is the earliest name to which a correct description was appended.

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XXXIII.—MISCELLANEOUS NOTES.

Dr. J. G. Baker.—The honorary degree of D.Sc., has been conferred by the University of Leeds upon Mr. J. G. Baker, F.R.S., late Keeper of the Herbarium and Library.

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