THE BRITISH SPECIES OF THE GENUS *DIAPORTHE* NITS. AND ITS SEGREGATES*

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The following account of the British species of the genus *Diaporthe* is based largely upon the collections in the herbarium of E. W. Mason. I have included such collections of British species as I have examined in the course of a study of this genus and also species described from Great Britain. No extensive examination of British herbaria and collections has been made, however, and there are probably a number of other species which have been collected from this region. Grove and others have reported a number of species of *Phomopsis* which are supposed to be the pycnidial stage of various species of *Diaporthe*. Inasmuch as these are merely supposed or observational connections, such species have not been included. Nevertheless, the species here considered will probably represent the bulk of those occurring in Great Britain and will serve as a basis for the study of this genus there. Only such collections as have been actually examined are cited.

No attempt has been made to make a critical study of the conidial stages such as the species of the form-genus *Phomopsis*, etc. Such conidial stages as are recorded in the literature in connection with the species of *Diaporthe* are listed under these respective species. It should be kept in mind, however, that many of these connections are merely assumed from association with the perithecial stage. The frequent occurrence of more than one species of *Diaporthe* or *Phomopsis* on one and the same host together with the variation and difficulty of determination of species within *Phomopsis* and related form-genera make such assumptions liable to error from several sources.

The genus *Diaporthe* is here limited to those species with equally two-celled ascospores and showing blackened outlining zones within the substratum. This includes a compact related group of species, practically all members of which have a conidial stage of the *Phomopsis* type. Species with unequally two-celled ascospores are placed in the genus *Apioporthe* v. Höhn., and those with one-celled ascospores in the genus *Diaporthopsis* Fabre. The remaining species, consisting of a heterogeneous group with two-celled ascospores but no outlining zones within the substratum, are included in the genus *Cryptodiaporthe* Petrak. The species of this genus have various types of conidial stages and show relationships to various other genera, the details of which are not as yet clear.

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The stromata of these fungi consist of two rather distinct elements. The first to be formed is usually the *ectostroma* which consists of a conical or pulvinate mass of fungous tissue produced on the bark surface just beneath the periderm or extending somewhat into the superficial layers of the bark. The conidial hymenium, when present, is formed within locules in this tissue. The ectostroma also serves as a mechanical tissue for the rupture of the periderm on woody stems.

The *entostroma*, within which the perithecial initials arise and develop, occurs within the bark or woody tissues usually beneath the ectostroma. It consists of a more or less strongly developed proliferation of fungous mycelium within the host tissues. In some species this region is scarcely recognisable as a differentiated area, but in others it becomes definitely modified in colour and texture through the disintegration of the host tissue and the compacting of these remains by the growth of fungous hyphae. In the genus *Diaporthe*, as here recognised, these areas are more or less definitely outlined by a blackening of their periphery, as often occurs in sclerotial or other stromatic formations.

The configuration of the entostroma and the arrangement of the perithecia are various. The old terms of effuse, diatrypoid, valsoid and isolate, as applied to stromatic organisation, have never been clearly or sharply defined, and numerous transitional and variable forms exist. I have found a division into *evenly effuse*, *pustulate-effuse* and *isolate* types to be much more serviceable in the diagnosis of species.

An *effuse* stroma is one in which a number of separately erumpent perithecia or more than one group of collectively erumpent perithecia occur within the same entostromatic area.

An *effuse* stroma is considered as *evenly effuse* if there is no blackened dorsal zone, or if the dorsal blackening is limited to the surface of the bark and does not dip into this tissue. It is considered as *pustulate-effuse* if there is present a dorsal zone which dips into the bark between the perithecia or perithecial groups.

An *isolate* stroma is one which contains only one definitely orientated group of collectively erumpent perithecia. This type is not of such great value in the separation of species because many species with pustulate-effuse stromata may often produce entostromata with a single group of perithecia which are then of the isolate type.

The orientation of the perithecia into definite groups, although quite distinct and characteristic in some species, is extremely variable in others.

The custom of describing as new each occurrence upon a distinct host genus has made the separation of species upon a purely morphological basis a difficult one. Some species are definitely limited in their host range and have a correlated morphological identity. In others a given morphological species appears to occur on a wide range of hosts

with a wide range of morphological variation. The host forms in such species-complexes show a widely overlapping range of morphological characters and cannot be separated on this basis. I recognise, however, that there may exist host varieties or even species in such groups which might be separated when further comparative data, especially in regard to connected conidial stages, becomes available. For this reason such host forms, with their synonymy, are listed separately under the morphological species in question.

The following abbreviations have been used in the citation of collections:

K. Herbarium of the Royal Botanic Gardens, Kew.
M.H. Herbarium of E. W. Mason.
W.H. Herbarium of L. E. Wehmeyer.

KEY TO SEGREGATED GENERA

I. Spores one-celled. *Diaporthopsis*

II. Spores two-celled.

A. Spores unequally two-celled. *Apioporthe*

B. Spores equally two-celled.

1. Blackened zones present in the substratum (usually absent in *D. decedens* and scanty in *D. leiphaemia*). *Diaporthe*
2. Blackened zone not present in substratum. *Cryptodiaporthe*

DIAPORTHE Nits. emend.

Perithecia formed within the substratum, erumpent to the exterior through an ectostroma or directly through the overlying tissues by means of a more or less elongated perithecial neck; scattered singly, irregularly clustered or in definitely orientated groups; formed within an area of entostromatic development which shows a marginal blackening of the tissues, at least at some points. Asci clavate to cylindric with a refractive ring in the thickened apical wall, sessile, soon freed from their attachment by dissolution of the basal portion and coming to lie free within the perithecium. Paraphyses broad, band-like, present at first but disappearing at maturity. Spores elliptic-fusoid to cylindric, straight inequilateral or curved, two-celled, hyaline, sometimes appendaged and biseriate to uniseriate in the ascus.

In the following key an attempt is made to separate the species without reference to the host inhabited. As there are often overlapping forms in some groups and as the host is often a great aid in the identification of species, the host is given in parentheses after each species.

KEY TO BRITISH SPECIES OF *DIAPORTHE*

I. Entostroma evenly effuse.

A. On herbaceous stems.

1. Spores narrow, 2–2·5 (3)μ in diam., ostioles long filiform. 2, *D. Chailletii* (*Atropa*).

2. Spores broader, 2·5–4μ in diam., ostioles conical to cylindric, spine-like.

a. Entostroma sharply margined, on the surface, by a blackened line or ridge.

(I) Entostroma small, strongly developed, becoming pseudoparenchymatous, raised above the substratum and heavily blackened. 4, *D. eumorpha* (*Astragalus, Daucus, Vinca*)

(II) Entostroma not so strongly developed, varied in size, shape and surface blackening. 3, *D. pardalota*

b. Entostroma not sharply margined on the surface. 1, *D. Arctii*

B. On woody stems (many of these species grade one into the other and are often difficult to separate).

1. Spores narrow, 2–2·5 (3)μ in diam. 8, *D. pulla* (*Hedera*)

2. Spores broader, 2·5–5μ in diam.

a. Spores 9–15, never over 15μ long.

(I) Perithecia irregularly scattered or clustered, erumpent singly or in loose clusters.

(A) Spores broad, 10–12 × 3·5–5μ, two-guttulate at maturity, perithecia scattered singly. 9, *D. Hederae* (*Hedera*)

(B) Spores narrower, 9–15 × 2·5–4μ, four-guttulate at maturity, perithecia scattered singly or clustered.

(1) Ostioles short conical to cylindric, scattered. 5, *D. eres*

(2) Ostioles often elongate, filiform or sinuous, erumpent singly or in large loose clusters. 6, *D. medusaea*

(II) Perithecia usually grouped in definite clusters and erumpent as a compact disc-like fascicle of ostioles. 7, *D. spiculosa*

b. Spores 13–22μ long, usually some spores beyond the range (15μ) of the above group.

(I) Blackened zones present within the substratum.
10, *D. Sarothamni* var. *Dulcamarae* (*Solanum*)

(II) Blackened zones normally absent.
11, *D. decedens* (*Corylus*)

II. Entostroma pustulate-effuse (dorsal zone dipping into bark tissue).
A. Spores never more than 5·5μ in diam. (except in *D. varians* which has spores 4–6·5μ).
1. Entostromatic areas blackened or dark.
17, *D. syngenesia* (*Rhamnus*)
2. Entostromatic areas not blackened, usually light.
a. With a well-developed conical ectostroma through which the fascicle of ostioles is erumpent as a compact disc-like cluster.
(I) A definite obvious ventral zone within the wood.
19, *D. impulsa* (*Sorbus*)
(II) No obvious ventral zone present.
(A) Spores 11–15 × 2–3μ. 18, *D. strumella* (*Ribes*)
(B) Spores 15–20 × 2·5–5·5μ.
21, *D. leiphaemia* (*Quercus*)
b. Ectostroma not well developed, obliterated by the loose fascicle of ostioles erumpent through it.
(I) Stromata only slightly pustulate if at all.
(A) Ventral zone absent. 7, *D. spiculosa*
(B) Ventral zone present.
10, *D. Sarothamni* var. *Dulcamarae* (*Solanum*)
(II) Stromata definitely pustulate to isolate.
(A) Spores mostly 2–4μ in diam. (occasionally 5μ in *D. pustulata*).
(1) Stromata often isolate in character, often outlined on the surface by a blackened marginal line or ridge, ventral zone definite, complete. 14, *D. pustulata* (*Acer*)
(2) Stromata rarely isolate, not outlined on surface, ventral zone often incomplete.
12, *D. oncostoma* (*Robinia*)
(B) Spores 4–6·5μ in diam.
(1) Spores characteristically curved or inequilateral, ventral zone definite.
15, *D. varians* (*Acer*)
(2) Spores straight at maturity, ventral zone faint or absent.
13, *D. Crataegi* (*Crataegus*)

B. Spores 5·5μ or more in diam.
1. Spores not over 18μ long.
a. Entostromatic areas dark. 20, *D. fibrosa* (*Rhamnus*)
b. Entostromatic areas light.
16, *D. inaequalis* (*Cytisus*, *Amorpha*, *Genista*)
2. Spores 17–55μ long, always some over 18μ.
a. Spores 17–25μ long, ventral zone present.
23, *D. taleola* (*Quercus*)
b. Spores 35–55μ long, ventral zone absent.
22, *D. tessella* (*Salix*)

1. **Diaporthe Arctii** (Lasch) Nits.

Pyr. Germ. (1870), 268

Entostroma widely effuse and indefinitely outlined on surface: appearing as slightly, irregularly or heavily blackened effuse or confluent areas, or merely as numerous conical to spine-like ostioles erumpent singly or in loose groups. Surface of bark usually blackened to form a dorsal zone, but often masked by the overlying epidermis. Ostioles conic to cylindric, erumpent singly or in small groups. Ventral zone present or absent, usually present at least at the margins of the stroma. Perithecia 280–480 × 160–320μ, widely scattered or at other times crowded or tending to be clustered in small groups, usually in wood but sometimes in the bark when that tissue is well developed. Asci clavate with a refractive ring in the apex, 47–60 × 7–10μ. Spores biseriate, fusoid-ellipsoid, straight or more or less inequilateral or curved, two-celled (often tardily septate), hyaline, constricted at the septum when mature, 12–15 (17) × 2·5–4μ.

This species*, according to the writer's conception of it, has been described under a number of names and on a number of hosts. There is considerable variation in different characters on these different hosts, and on some hosts a rather characteristic appearance occurs. When one considers the entire range of variation, however, on all of the different hosts, there are no good diagnostic characters for the separation of species. The range of variation on any one host always shows a wide overlapping of the variation of other host forms. Inasmuch as some of these forms may prove to be good varieties after further study and comparison, they are listed separately with their descriptions and synonymy.

On Arctium:

Sphaeria Arctii Lasch in *Herb. Myc.* (1846), 1046.
S. immersa Fuck. *Fung. Rhen.* (1866), 1795.
Diaporthe immersa (Fuck.) Nits. *Pyr. Germ.* (1870), 274.

* For more detailed accounts of this and other species see L. E. Wehmeyer, *The genus* Diaporthe *Nit. and its segregates.*

Surface of substratum blackened over wide areas. Ostioles numerous, spine-like with conical apices, separately erumpent. Ventral zone definite, within the wood. Perithecia scattered singly in the wood. Spores straight to inequilateral, 11–15 × 2·5–3·5μ.

Hosts: *Arctium* spp.

British collections examined: Plowr. *Sphaer. Brit.* II, 34.

This is the typical form from which the species was described by Nitschke. It is common both in Europe and America.

CONIDIAL CONNECTIONS:

Phoma Arctii Sacc. in *Mich.* II (1881), 340.

Phomopsis Arctii (Sacc.) Trav. in *Fl. Ital. Crypt.* II (1906), 226.

Given as the pycnidial stage of *D. Arctii* by Saccardo, who describes the alpha conidia as 7 × 3–3·5μ and the "basidia" as 25 × 1·5μ. Obtained in ascospore culture by the writer (*Papers Mich. Acad. Sci.* VI (1927), 390). Alpha conidia 8–10 × 2–2·5μ. Beta conidia 18–25 × 1μ.

Phoma immersa Sacc. *Syll.* III (1884), 122.

Phomopsis immersa (Sacc.) v. Höhn. in *Sitz. Akad. Wiss. Wien,* CXV (1906), 680.

Given as the pycnidial stage of *D. immersa* by Saccardo. Nitschke (*Pyr. Germ.* 270) describes the "spermatia" as fusiform, 6–7 × 2–2·5μ and the "stylospores" as filiform, curved, 34 × 1μ.

On Brassica:

Diatrype coramblycola Berk. & Br. in *Ann. Mag. Nat. Hist.* ser. 5, I (1878), 29.

Diaporthe coramblycola (Berk. & Br.) Sacc. *Syll.* I (1882), 623.

Surface heavily blackened, somewhat raised above surrounding areas. Ostioles short, stout, conical, singly erumpent. Ventral zone definite. Perithecia scattered singly or crowded. Spores 11–13 × 2·5–3·5μ.

Host: *Brassica* sp.

British collections: **K**, Herb. Berk. April 17th, 1875 (type).

On Rumex:

Diaporthe maculosa Sacc. & Speg. in *Mich.* I (1878), 383.

D. Rumicis Nits. in *Grev.* VIII (1879), 107.

D. discors Sacc. in *Mich.* II (1880), 60.

D. discrepans Sacc. in *Mich.* II (1882), 568.

Dorsal blackening of bark surface showing through the epidermis as irregular blackened areas. Ventral zone present, incomplete or faint, usually just within the wood. Perithecia scattered singly. Spores often somewhat inequilateral, 12–14 × 2·5–3·5μ.

Host: *Rumex.*

British collections: Plowr. *Sphaer. Brit.* III, 41 (*D. Rumicis*).

Nitschke's *D. Rumicis* was based upon Italian specimens of Passerini but never published. It was issued in Plowright's exsiccata from King's Lynn and listed in *Grevillea.*

CONIDIAL CONNECTIONS:

Phoma Durandiana Sacc. & Roum. in *Rev. Myc.* VI (1884), 29.

P. Rumicis Auersw. in sched.

Phomopsis Durandiana (S. & R.) Died. in *Ann. Myc.* IX (1911), 24.

Phoma Durandiana was cited as the imperfect stage of *Diaporthe maculosa* by Saccardo. The conidia were given as 7–9 × 2–3μ.

On Umbelliferae:

Sphaeria inquilina Wallr. *Elench. Fung.* II (1828), 100.

S. umbellatarum Schw. *Syn. Am. Bor.* (1832), 208 (*1467).

Diaporthe inquilina (Wallr.) Nits. *Pyr. Germ.* (1870), 272.

D. Faberi Kze in *Fung. sel.* 1877, 266 (*sine diagnosi*); Sacc. *Syll.* I (1882), 649.

D. umbellatarum (Schw.) Ell. & Everh. *N. Amer. Pyr.* (1892), 739.

Surface heavily blackened or encrusted, or more or less masked by the overlying epidermis. Blackened spots limited in area or widely effuse. Marginal ridges often outlining the smaller spots or running irregularly in the larger areas. Perithecia 280–480μ in diameter, scattered singly. Ventral zones present or absent. Spores tardily septate, 9–15 × 2·5–3·5μ.

Host: *Conium Aquifolium.*

British collections: Plowr. *Sphaer. Brit.* I, 82 (*S. inquilina*). Vize, *Mic.-Fung. Brit.* 182 (*S. inquilina*).

No host is given for Plowright's collection but it appears to be on an umbelliferous host. The spores of this form on Umbellifers are tardily septate and may be confused with *Diaporthopsis Berkeleyi* which occurs on the same hosts. The spores, however, are narrower fusoid and four-guttulate rather than three-guttulate as in the *Diaporthopsis.* The surface is also more heavily blackened and the perithecia are larger and nearer the surface.

2. **Diaporthe Chailletii** Nits.

Pyr. Germ. (1870), 276

Sphaeria picea Pers. *Icon. Desc.* (1798), 40.

S. spiculosa Belladonnae Fr. *Elench. Fung.* II (1828), 75.

Forming widely effuse, irregularly blackened areas on the bark or wood surface, which are often exposed by the falling away of the periderm or bark. Ventral zone definitely present in the wood. Perithecia

320–480 × 160–320μ, scattered singly and separately erumpent as fine cylindric or somewhat elongated ostioles. Asci clavate, 40–50 × 6–7μ. Spores biseriate, ellipsoid-fusoid, two-celled, hyaline, straight, constricted at the septum, 11–12 × 2–2·5 (3)μ.

Host: *Atropa Belladonna.*

British collections: Plowr. *Sphaer. Brit.* III, 32.

This species differs from *D. Arctii* in the somewhat shorter and narrower spores and in the more elongated filiform ostioles.

3. **Diaporthe pardalota** (Mont.) Fuck.

Symb. Myc. (1869), 206

Appearing on the surface as sharply outlined entostromatic areas with a marginal blackened line or ridge where the central zone abuts upon the surface. Entostromatic areas limited in extent (1–7 mm.), confluent, or more widely effuse, margin even, or, more usually, irregularly lobed. Surface of substratum blackened heavily, only slightly, or not at all. Perithecia spherical or somewhat flattened, 160–480 × 120–300μ, scattered singly or occasionally in small groups of 2–3. Ostioles short cylindric to conical, slightly erumpent. Ventral zone definite within the wood. Asci clavate, 40–55 × 6–8μ. Spores biseriate, fusoid-ellipsoid, two-celled, hyaline, slightly constricted at the septum, straight or sometimes inequilateral or slightly curved, 9–15 × 2·5–4μ.

This species, as described above, differs from *D. Arctii* in the rather constant presence of superficial lines or ridges bounding the entostromatic areas beneath. There are some host forms which are more or less intermediate between this species and *D. Arctii*. This species also occurs on a variety of hosts, which occurrences have been described as new species in many cases. Here again the overlapping of morphological differences makes the separation of species on this basis impossible, and these variations are described as host forms.

On Cornus:

Diaporthe crassicollis Nits. *Pyr. Germ.* (1870), 258.
D. intermedia Nits. in Herb. (inedit.).
D. Corni Fuck. *Symb. Myc.* (1869), 207.
D. Brenckleana Sacc. in *Myc.* XII (1920), 202.

Entostromata somewhat limited in area or widely effuse. Margin usually irregularly lobed and sinuous. Usually where the dorsal blackening is developed just beneath the epidermis, the stromatic areas are outlined on the surface by a blackened line or ridge. When the periderm is well developed, however, this marginal line is obscured or absent. Surface of bark heavily blackened over entire area or in a spot-like manner. Ventral zone definite in wood, or only lateral.

Perithecia 240–400 × 160–240μ, scattered singly or loosely grouped. Spores 11–14 × 2·5–4μ.

Hosts: *Cornus* spp.

British collections: Vize, *Mic.-Fung. Brit.* 590.

This form on woody stems grades off into typical *D. eres*. The European collections (*D. Corni*) show the tendency towards the formation of the superficial outlining zones as in *D. pardalota*. American specimens (of *D. cornicola*), on the other hand, do not show these superficial zones and are typical of *D. eres*.

CONIDIAL CONNECTIONS:

Phoma Corni Sacc. in *Mich.* II (1880), 94.

Phomopsis Corni (Sacc.) Trav. in *Fl. Ital. Crypt.* II (1906), 268.

Fuckel cites the conidia of his *D. Corni* as cylindric-oblong, curved, 8 × 3μ. Saccardo describes the conidia as 8–10 × 2–3μ and the "basidia" as uncinate, 25 × 1μ.

On Epilobium:

Dothidea striaeformis Fuck. non Fr. in *Fung. Rhen.* (1864), 1012.

Diaporthe Epilobii Cke (non Fuck.) *Fung. Brit.* II (1879), 686. Sacc. *Syll.* I (1882), 690.

D. striaeformis Nits. in litt. in Fuck. *Symb. Myc.* (1868), 206.

On surface as elongate blackened patches. Stromata abruptly but not prominently margined, limited in area (1–3 mm.) or confluent and extending for some distance. Surface of bark heavily blackened. Ventral zone definite just within the wood. Perithecia scattered singly, crumpent as very short ostioles. Spores 11–12 × 2·5–3·5μ.

Host: *Epilobium.*

British collections: Cke, *Fung. Brit.* II, 686. Vize, *Micr.-Fung. Brit.* 591.

Saccardo gives Plowr. *Sphaer. Brit.* III, 42 as being *D. Epilobii* Cke. The copy in the Farlow Herbarium, although showing no spores, appears to be the *D. Epilobii* of Fuckel (*Didymella tosta*). Vize, *Mic.-Fung. Brit.* 591, shows only pycnidial pustules. The conidia seen were fusiform, 8–10 × 2–2·5μ.

On Euphorbia:

Diaporthe Euphorbiae Cke in *Grev.* III (1874), 67.

On surface as small (1–10 (15) × 1–3 mm.), fusoid or elliptic, blackened patches, or as more widely effuse areas. Ventral zone definite in the wood. Perithecia scattered singly. Margin of stromata sharp but not prominent. Spores 9–12 × 2·5–3·5μ.

Host: *Euphorbia amygdaloides.*

British collections: Plowr. *Sphaer. Brit.* III, 38.

CONIDIAL CONNECTIONS:

Phoma Euphorbiae Sacc. in *Mich.* II (1881), 339.
Phomopsis Euphorbiae (Sacc.) Trav. in *Fl. Ital. Crypt.* II (1906), 233.

Given by Saccardo as the conidial stage of *D. Euphorbiae*. Conidia ovoid-oblong, 7 × 3–3·5μ.

On Ilex:

Diaporthe ilicina Cke in *Grev.* XVIII (1890), 74.

Entostromatic areas rather extensive, sharply outlined but irregular in shape. Surface of bark heavily blackened only about the ostioles and appearing as blackened spots on the surface. Ventral zone within the wood. Perithecia 400–440 × 240–280μ, scattered singly or in small groups of 2–3. Spores 12–15 × 2·5–4μ.

Host: *Ilex aquifolium.*

British collections: Plowr. *Sphaer. Brit.* III, 40. Cke, *Fung. Brit.* II, 490. **M.H.** 763, Minstead, July, 1925.

Another of the forms on woody stems which differ from *D. eres* only in the presence of outlining zones on the surface, and which might better be placed under that species, as they are probably merely variations of it as is shown by the occurrence of specimens without this superficial marginal zone. The specimen in the Mason Herbarium is intermediate, showing the marginal zones only occasionally.

On Polygonatum:

Sphaeria pardalota Mont. in *Ann. Sci. nat.* sér. 2, I (1834), 304.
Diaporthe pardalota (Mont.) Nits. in litt. Fuck. *Symb. Myc.* (1869), 206.

Entostromatic areas elliptical to oblong, limited in area (2–5 (15) mm.). Surface blackened or not, margin even, sharply defined by a blackened zone. Perithecia 320–480 × 120–160μ, scattered singly. Ventral zone definite. Spores 9·6–12 × 2·5–3·5μ.

Host: *Polygonatum (Convallaria) multiflora.*

British collections: Berk. *Brit. Fung.* III, 175 (*S. pardalota*). Cke, *Fung. Brit.* II, 687.

The form which is the type of the species, with sharply outlined limited stromata.

CONIDIAL CONNECTIONS:

Phoma Convallariae West. in *Bull. Acad. Roy. Belg.* XIX (1852), (15), 50.
P. polygonatea Sacc. in *Mich.* II (1882), 617 (*Syll.* III (1884), 161).
Phomopsis Convallariae (West.) Grove in *Kew. Bull.* (1921), 138.

Grove considers *P. Convallariae* as the *Phomopsis* stage of *D. pardalota* and *P. polygonatea* as the same species. He gives the alpha conidia as

ellipsoid-fusoid, 8–9 × 1·5–2·5μ and as sometimes appearing one-septate (due to guttulae?). Saccardo describes the conidia of *P. polygonatea* as oblong, 9–10 × 3μ.

4. **Diaporthe eumorpha** (Dur. & Mont.) Maire.

Myc. Bor.-Afr. (1917), 246

Appearing upon the surface as numerous circular to elliptical or irregularly shaped, blackened, often somewhat raised areas, 0·5–5 × 0·5–1·5 mm., through the surface of which the ostioles are barely and separately erumpent. Margin of stroma even, sharp, often differentiated or ridge-like as in *D. pardalota*. Surface of stem heavily blackened. Entostroma well developed, ventral zone definite. Perithecia 200–320 × 120–240μ, scattered singly and separately erumpent. Asci clavate, 40–47 × 6–8μ. Spores biseriate, fusoid-ellipsoid, straight or slightly inequilateral, one-celled at first becoming two-celled, hyaline, finally constricted at the septum, four-guttulate, 9–15 × 2·5–4μ.

This species also occurs on a number of hosts and has been described under a number of names. It differs from *D. pardalota* in the smaller more definitely organised and more richly developed entostroma, which in some forms becomes raised above the surface in a somewhat *Diatrype*-like formation. The writer has seen it from Great Britain on only the one host below. The spore measurements given by Cooke (20–22μ) are incorrect.

On Vinca:

Sphaeria Vincae Cke in *Grev.* v (1876), 63.
Diaporthe Vincae (Cke) Sacc. *Syll.* i (1882), 656.

On surface as small heavily blackened areas, 0·2–0·5 mm. in diameter. Margin sharp and even but not differentiated. Ventral zone definite in the wood. Perithecia scattered singly, only a few in each stromatic area. Spores often inequilateral, 9–12 × 2·5–3μ.

Host: *Vinca.*

British collections: Cke, *Fung. Brit.* ii, 493. Vize, *Micr.-Fung. Brit.* 293.

5. **Diaporthe eres** Nits.

Pyr. Germ. (1870), 246

Appearing upon the surface as small pustulate ruptures or angular perforations of the periderm, often exposing the blackened surface of the bark or ectostromata. Ostioles short cylindric to somewhat elongated, erumpent singly or in small loose clusters, or occasionally in crowded masses. On twigs which are decorticated or have the periderm exfoliated, as widely effuse blackened areas with numerous erumpent ostioles. Entostroma mostly evenly effuse, usually over wide areas. Surface of bark usually blackened, dorsal blackening sometimes local,

chiefly about the erumpent ostioles, sometimes entirely lacking, rarely dipping slightly into the bark. Ventral zone present, at least at the extreme margins of the fruiting areas, usually more or less complete beneath, occasionally entirely absent. Numerous small conical or pulvinate ectostromata are formed on the bark surface causing the ruptures or perforations of the periderm. Perithecia spherical to flattened, 240–800 × 160–500μ, scattered singly, irregularly crowded, or more or less definitely grouped, separately or collectively erumpent, not definitely orientated beneath the ectostromata, but usually erumpent through them, immersed in either the bark or the wood. Asci clavate with a refractive ring in the apex, 40–60 × 5–8μ. Spores biseriate, hyaline, long narrow fusoid or often inequilateral, one-celled when young and immature, becoming broader, two-celled, fusoid, constricted at the septum, 9·5–15 × 2·5–4μ at maturity.

The forms included in the description as outlined above constitute the largest species-complex of the genus. Such forms have been described under a multitude of names on a variety of hosts, but any attempt to separate valid species on morphological grounds breaks down on account of the widely overlapping ranges of variation. One or a few specimens from a given host may present what appears to be a characteristic appearance, but an examination of larger series of specimens presents all intermediate types and when such characteristic appearances are further discounted on the basis of the effect of the host substratum, no valid criteria for separation remain. It is possible, however, that a more careful and detailed comparative study of both pycnidial and perithecial stages of these forms may indicate the presence of distinct host varieties, and host forms are therefore listed separately.

On Acer:

Diaporthe fallaciosa Nits. *Pyr. Germ.* (1870), 254.
D. protracta Nits. *Pyr. Germ.* (1870), 255.
D. Petrakiana Sacc. in *Ann. Myc.* XII (1914), 290.

Quite variable. On surface as small pustulate groups of short cylindric ostioles or as wider angular ruptures exposing the blackened bark surface. Dorsal blackening of bark surface present or absent. Ventral zone definite within wood or only at lateral margins of the fruiting areas. Ostioles short cylindric, usually erumpent in groups but sometimes singly. Perithecia thickly scattered or loosely grouped. Spores 10–14 × 2·5–4μ.

Hosts: *Acer campestris; A. Pseudo-platanus.*

British collections: Cke, *Fung. Brit.* II, 244 (*S. blepharodes*); 685 (*D. Aceris*). Plowr. *Sphaer. Brit.* III, 35 (*D. protracta*). **M.H.** (*D. protracta*) 193, Hadzor Hall, March, 1930 (parasitised by *Nectria*); 194, King Thorpe Wood, September, 1930.

On Aesculus:

Specimens of a *Phomopsis* in the Mason Herbarium appear to be *P. coneglanensis* (Sacc.) Trav., which is cited as the pycnidial stage of *Diaporthe coneglanensis* which is in turn a form of *D. eres* on *Aesculus*. A note in Mason's No. 1206 (labelled *D. coneglanensis*) gives ascospores as 12–14 × 4μ. No ascospores were found, but typical ventral zones were seen within the wood.

The pycnidial stage appears on the surface as fusoid to circular pustules often seriately arranged and erumpent through the lenticels. The pycnidial stromata were 0·5–2·5 mm. in diameter, light olive-brown to greenish black and contained irregularly chambered locules. The alpha conidia were oblong to fusoid, one-celled, hyaline, two-guttulate, 5–8·5 × 2–2·5μ. The beta conidia were filiform, straight to curved or hamate and (12) 16–25 × 0·8–1μ. The dried spore masses were olive-green.

On Conifers:

Sphaeria conorum Desm. in *Ann. sci. nat.* sér. 3, v (1846), 76.
S. strobilicola Lib. in Herb.
Valsa occulta Fuck. *Fung. Rhen.* (1863), 622.
Diaporthe occulta (Fuck.) Nits. *Pyr. Germ.* (1870), 266.
D. pitya Sacc. *Fung. Ven.* ser. 4, VII (1875).
D. conorum (Desm.) Niessl in *Hedw.* XV (1876), 2.
D. pinophylla Plowr. & Ph. in *Grev.* IV (1876), 124.
D. pinicola Hazsl. in *Math. es term. Közlem.* XXV (1892), 2, 200.
D. conigena Feltg. *Vorst. Pilz. Lux.* Nachtr. III (1903), 136.
D. thujana Petr. in *Ann. Myc.* XIX (1921), 50.

On surface as minute pustules or pustulate ruptures. Ostioles fine cylindric, sometimes elongate filiform, erumpent singly, or in small clusters. Dorsal blackening irregular or present only about the ostioles. Ventral zones definite, usually within the bark. Entostromata often limited in area. Perithecia irregularly scattered or loosely grouped. Spores 9–12 × 2·5–4μ.

Hosts: *Pinus sylvestris, Pseudotsuga taxifolia, Cedrus.*

British collections: Plowr. *Sphaer. Brit.* III, 37 (*D. pinophylla*). **W.H.** ex Herb. G. G. Hahn (*D. pitya*) FP43976, Welshpool, Wales, September, 1926; FP43975, Lake Vyrnwy, Wales, September, 1926. **M.H.** 1132, Ham Paddock.

Occurring on a variety of conifers on twigs, cones and needles. There is a possibility of physiological forms or varieties occurring on the different conifer hosts, but so far there is no definite evidence of such a differentiation. The specimen on cedar in the Mason Herbarium is on a decorticated limb and presents a widely effuse heavily blackened surface with scattered elongated ostioles appearing like a form of

D. Arctii, but is probably merely a variation of this species. Hahn's material on *Pseudotsuga* shows many elongated ostioles.

CONIDIAL CONNECTIONS:

Phoma occulta Sacc. *Syll.* III (1884), 150.
Phomopsis occulta (Sacc.) Trav. in *Fl. Ital. Crypt.* II (1906), 221.
Sporonema strobilina Desm. in *Ann. sci. nat.* sér. 2, XVIII (1852), 368.
Plenodomus strobilinus (Desm.) v. Höhn. in *Sitz. Akad. Wiss. Wien*, CXIX (1910), 647.

The above have been given as the pycnidial stage of *Diaporthe occulta*.

Phoma conorum Sacc. in *Mich.* II (1882), 615.
Phomopsis conorum (Sacc.) Died. in *Ann. Myc.* IX (1911), 22.
P. conorum (Sacc.) v. Höhn. var. *naviculispora* Trav.
P. pitya (Sacc.) Lind pro parte, non *Phoma pitya* Sacc. Reported by Saccardo as the pycnidial stage of *Diaporthe conorum*.

The above synonymy is taken from Hahn (*Trans. Brit. Myc. Soc.* XIII (1928), 282), who gives a detailed account of this species, but reports no connection with the perithecial stage.

Phoma pitya Sacc. in *Mich.* I (1881), 126.
Sclerophoma pitya (Sacc.) Died. in *Ann. Myc.* IX (1911), 281, non *S. pitya* (Thum.) v. Höhn.
S. Magnusiana Wilson & Hahn in *Trans. Brit. Myc. Soc.* XIII (1928), 267.

Given by Saccardo as the conidial stage of *Diaporthe pitya*. The above synonymy and a detailed account of this species is given by Wilson and Hahn (*Trans. Brit. Myc. Soc.* XIII, 261), but no perithecial connection is reported.

Wilson (*Bull. Forestry Comm. Lond.* VI (1925), 11) gives *Phomopsis Pseudotsugae* Wils. (*Trans. and Proc. Bot. Soc. Edinburgh*, XXVIII (1920), 47–9) as the imperfect stage of *D. pitya*. Hahn (*in litt.*) states that he has failed to verify this and has obtained *P. occulta* from single ascospores of *D. pitya*.

Hahn (*Phytopath.* X (1920), 249) also reports a *Phomopsis juniperovora* Hahn as a parasite occurring on *Juniperus*, *Cupressus* and *Pseudotsuga* but not on *Pinus* and *Picea*.

From the above it can be seen that there is great confusion as to the species of *Phomopsis* on conifers and their perithecial connections. Hahn in a recent comparative study of these forms has reported eight distinct species (*Trans. Brit. Myc. Soc.* XV (1930), 32–93). Only one complete life history (*Diaporthe conorum—Phomopsis occulta*) is definitely established in this group, which illustrates the haphazard nature of observational connections.

On Corylus:

Diaporthe revellens Nits. *Pyr. Germ.* (1870), 302.
Sphaeria tumulata Cke & Ell. in *Grev.* v (1876), 49.
Diaporthe tumulata (Cke & Ell.) Sacc. *Syll.* i (1882), 634.
D. pusilla Sacc. in *Ann. Myc.* xii (1914), 289.

On surface as numerous pulvinate pustules with a central angular blackened disc through which the short cylindric ostioles are erumpent singly or in small clusters. Dorsal zone present or absent except about the ostiolar discs. Ventral zone within the wood. Perithecia loosely grouped or irregularly scattered. Spores 10·5–14 × 3–4μ.

Host: *Corylus Avellana.*

British collections: **M.H.** (*D. revellens*) 389, August, 1925; 390, Grabhurst, Minehead, March, 1927; 391, Llanbedr, Wales, September, 1924; 466, Mickleham, May, 1925; 467, Ashtead Downs, May, 1926; 468, Cambridge, May, 1925.

On Euonymus:

Sphaeria rostellata Lasch in Herb. Nits.

Ostioles barely and separately erumpent. Bark surface irregularly blackened. Ventral zone present. Perithecia thickly scattered. Spores 10–15 × 2·5–4μ.

Host: *Euonymus europaeus.*

British collection: Plowr. *Sphaer. Brit.* ii, 41 (*D. Laschii*).

On Fraxinus:

Sphaeria controversa Desm. in *Ann. sci. nat.* sér. 2, xvii (1842), 102.
S. ciliaris Curr. in *Journ. Micr. Soc.* vii (1859), 231.
Diaporthe scobina Nits. *Pyr. Germ.* (1870), 293.
D. Fraxini Fuck. *Fung. Rhen.* (1869), 2258.
D. controversa (Desm.) Nits. in Fuck. *Symb. Myc.* Nachtr. i (1871), 319.
D. samaricola Ph. & Plowr. in *Grev.* iii (1875), 126.
D. obscurans Sacc. *Fung. Ven.* ser. 4, vii (1875).
D. ciliaris (Curr.) Sacc. *Syll.* i (1882), 676.
D. priva Sacc. & Roum. in *Rev. Myc.* vi (1884), 27.
D. scobinoides Schulz. & Sacc. in *Rev. Myc.* vi (1884), 69.

Quite variable. On surface as numerous minute angular pustules. Bark surface often heavily blackened or sometimes free from such blackening. Ventral zones usually present, often deep in the wood. Perithecia 260–400 × 160–480μ, irregularly scattered, mostly singly, in either bark or wood. Spores 10–14 × 2·5–4μ.

Host: *Fraxinus excelsior.*

British collections: Plowr. *Sphaer. Brit.* ii, 40 (*D. scobina*); ii, 42 (*D. samaricola*, on samaras). **K**, Herb. Currey, December, 1881 (*D. ciliaris*). **M.H.** (*D. controversa*) 691 to 696, Bristol, Hadzor Hall, King-

thorpe Wood, Llanbedr, Lessness Woods, Mickleham, September to March.

CONIDIAL CONNECTIONS:

Phoma controversa Sacc. in *Mich.* II (1882), 616.
Phomopsis controversa (Sacc.) Trav. in *Fl. Ital. Crypt.* II (1906), 273.
Phoma scobina Cke in *Grev.* XIII (1885), 92.
Myxolibertella scobina (Cke) v. Höhn. in *Ann. Myc.* I (1903), 526.
Phomopsis scobina (Cke) v. Höhn. in *Sitz. Akad. Wiss. Wien*, CXV (1906), 681.

Phoma controversa was given by Saccardo as the conidial stage of *D. controversa*, with conidia fusoid 7–8×2–2·5μ and "basidia" curved, 12×1μ. Cooke cited *Phoma scobina* as the conidial stage of *D. scobina* and described the conidia as fusoid to clavate, 10–12×3–3·5μ. Von Höhnel gave the alpha conidia of his *Myxolibertella* as 8–12×1·5μ and the beta conidia as filiform, curved and 20–25×1μ. Number 697 in the Mason Herbarium contains pycnidia with fusoid, bi-guttulate alpha conidia 6–7×1·5–2·5μ and filiform hamate beta conidia 15–24×1μ. This pycnidial stage on Ash has the alpha conidia of *Phomopsis controversa* and the beta conidia of *P. scobina*.

Phomopsis pterophila (Fuck.) Died. (*Krypt. Mark. Brand.* 9, Pilze 7 (1915), 255), given as the conidial stage of *D. samaricola*, has fusoid alpha conidia which are 7–8×2·5μ and, therefore, also similar to those on Mason's specimen (see also Grove in *Kew Bull.* (1917), 61).

On Hedera:

Diaporthe Nitschkei Kze, *Fung. sel.* (1875), 124.
D. Helicis Niessl, *Notiz. Pyr.* (1876), 50.
Chorostate Helicis (Niessl) Trav. in *Fl. Ital. Crypt.* II (1906), 200.

On surface as perforations of the periderm through which one or a few short cylindric ostioles are barely erumpent. Surface of bark more or less heavily blackened and often exposed as blackened areas by the exfoliation of the periderm. Ventral zones within wood. Perithecia scattered singly or in small groups. Spores 11–14×2·5–4μ.

Host: *Hedera Helix.*

British collections: **M.H.** (*D. pulla*) 748, Minstead, August, 1925.

This form on *Hedera* is doubtfully distinct from *D. pulla* on the same host. Typical specimens of *D. pulla* have irregularly pustulate dorsal zones, more filiform ostioles and somewhat narrower spores.

On Lonicera:

Variable, on surface as barely erumpent ostioles or as small circular, blackened, ectostromatic discs or as pulvinate confluent pustules. Surface of bark irregularly blackened. Ventral zones present or absent. Perithecia large, 400–800μ in diameter, usually scattered singly or

loosely grouped in the wood, but sometimes more crowded in the bark. Spores 11–14×2·5–3·5μ.

Host: *Lonicera Periclymenum.*

British collections: **M.H.** 782.

This specimen differs from the typical occurrence on this host. The perithecia are usually buried in the wood and barely erumpent as short ostioles. Here the perithecia are clustered in the very thin bark, causing hemispherical pustulate stromata which are often confluent and appear superficially like a *Eutypella.* The entire wood tissue is stained a dark grey and the ventral zones are irregularly present. This illustrates the difference in appearance which the formation of the perithecia in the bark instead of the wood may bring about.

CONIDIAL CONNECTIONS:

Phoma cryptica Sacc. in *Mich.* I (1879), 521.
Phomopsis cryptica (Sacc.) v. Höhn. in *Sitz. Akad. Wiss. Wien,* CXV (1906), 680.

Nitschke describes the "spermatia" of his *D. cryptica* as fusiform 7–8×2μ and the "stylospores" as filiform, variously curved, 33×1μ. Such conidia were seen on this type material.

On Lycium:

Diaporthe importata Nits. *Pyr. Germ.* (1870), 315.

On surface as small ectostromata or irregular clusters of ostioles erumpent through pustulate ruptures of the periderm. Dorsal blackening present or absent. Ventral zone present or absent. Perithecia irregularly scattered, often collectively erumpent. Spores 11–14×2·5–4μ.

Host: *Lycium barbarum.*

British collections: Plowr. *Sphaer. Brit.* III, 29.

CONIDIAL CONNECTIONS:

Phoma importata Sacc. in *Mich.* II (1881), 380.
Phomopsis importata (Sacc.) Died. in *Ann. Myc.* IX (1911), 24.

Given as the conidial stage of *D. importata* by Saccardo. Alpha conidia cylindric-fusoid, 7–8×2·5–3μ and "basidia" fasciculate, acicular, 18–20×2μ.

On Phillyrea:

Diaporthe Phillyreae Cke in *Grev.* VII (1879), 81.

On surface as numerous pustulate ruptures exposing the blackened bark surface. Dorsal blackening only above the perithecia. Ventral zone deep in wood. Perithecia 320–400×240μ, scattered singly,

often erumpent in small groups. Spores rather small, straight or inequilateral, strongly constricted, 11–12 (13) × 2–2·5μ.

Host: *Phillyrea.*

British collections: **K**, Herb. M. C. Cooke.

On Populus and Salix:

Valsa convergens Fuck. *Enum. Fung. Nass.* (1860), 24.
Diaporthe forabilis Nits. *Pyr. Germ.* (1870), 259.
D. putator Nits. *Pyr. Germ.* (1870), 306.
D. Briardiana Sacc. *Misc. Myc.* I (1884), 3.
D. simplicior Feltg. *Vorst. Pilz. Lux.* Nachtr. III (1903), 154.
D. extranea Sacc. in *Ann. Myc.* XII (1914), 289.

Variable. On surface as numerous pustulate ruptures through which the ostioles are erumpent singly or in small clusters. Ostioles sometimes slightly elongated. Surface of bark heavily or irregularly blackened. Ventral zones definite in wood. Entostromatic areas sometimes limited in area. Perithecia scattered singly or irregularly crowded, often collectively erumpent. Spores 11–15 (16) × 2·5–4μ.

Host: *Populus tremula.*

British collections: Plowr. *Sphaer. Brit.* III, 30 (*D. putator*).

This form has spores which tend to be somewhat longer than the average spores of *D. eres* and in this respect is transitional to such species as *D. sociabilis.*

On Rhus:

Diaporthe Rhois Nits. *Pyr. Germ.* (1870), 315.
Valsa Rhois Cke, *Fung. Brit.* I, 245.
Gnomonia rhoina Feltg. *Vorst. Pilz. Lux.* Nachtr. II (1901), 131.
Diaporthe rhoina (Feltg.) Rehm in *Sitz. Akad. Wiss. Wien,* CXV (1906), 1250, non *D. rhoina* (Cke & Ell.) E. & E., non *D. rhoina* Feltg.

On surface as numerous pustulate blackened ruptures. Surface of bark blackened evenly or only about the barely erumpent ostioles. Ventral zone complete or sometimes merely lateral. Perithecia usually small (240–400 × 100–320μ), irregularly scattered. Spores 10–13·5 × 2·5–4μ.

Host: *Rhus.*

British collections: Cke, *Fung. Brit.* II, 228.

CONIDIAL CONNECTIONS:

Phoma Rhois Sacc. in *Mich.* II (1881), 340.
Phomopsis Rhois (Sacc.) Trav. in *Fl. Ital. Crypt.* II (1906), 258.

Described by Saccardo with alpha conidia oblong-cylindric 10 × 2–2·5μ and "basidia" filiform-hamate, 25 × 1μ.

On Rosa:

Diatrype incarcerata Berk. & Br. in *Ann. Mag. Nat. Hist.* ser. 3, III (1859), 364.
Diaporthe incarcerata (Berk. & Br.) Nits. *Pyr. Germ.* (1870), 297.
D. simulans Sacc. *Fung. Ven.* ser. 4 (1875), 11.
D. oligocarpoides Rehm in *Hedw.* XXVI (1887), 90.

On surface as numerous papillate swellings or circular ruptures of the periderm. Surface of bark irregularly blackened. Ventral zone definite in the wood. Perithecia usually scattered singly and singly erumpent. Spores 11–14×2·5–4μ.

Host: *Rosa* sp.

British collections: **K**, Herb. Berkeley, 1879 (*S. incarcerata*). Vize, *Mic.-Fung. Brit.* 592 (*D. incarcerata*).

CONIDIAL CONNECTIONS:

Phoma incarcerata Sacc. in *Mich.* II (1880), 95.
Phomopsis incarcerata (Sacc.) v. Höhn. in *Sitz. Akad. Wiss. Wien*, CXV (1906), 681.

Nitschke describes the "spermatia" of his *D. incarcerata* as subcylindric, 7×2μ and the "stylospores" as filiform, curved, 24–30 × 1μ.

On Symphoricarpos:

Sphaeria Ryckholtii West. in *Bull. Acad. Roy. Belg.* sér. 2 (1864), 7.
Valsa Ryckholtii (West.) Kickx, *Fl. Crypt. Flandres*, I (1867), 323.
Diaporthe Ryckholtii (West.) Nits. *Pyr. Germ.* (1870), 319.

On surface as pustulate ruptures through which one or a few short stout ostioles are erumpent. Dorsal blackening irregularly present. Often tending to dip slightly into the bark. Perithecia rather large, somewhat grouped and collectively erumpent. Ventral zone usually present. Spores 11–13×2–3μ.

Host: *Symphoricarpos racemosus.*

British collections: Plowr. *Sphaer. Brit.* III, 28.

CONIDIAL CONNECTIONS:

Phlyctaena phomatella Sacc. var. *Symphoricarpi racemosae* Sacc. in *Mich.* II (1880), 104.
Phoma Ryckholtii Sacc. *Syll.* III (1884), 70.
Phomopsis Ryckholtii (Sacc.) v. Höhn. in *Sitz. Akad. Wiss. Wien*, CXV (1906), 681.

Nitschke described the "spermatia" of his *D. Ryckholtii* as fusoid 6–8×2·5μ. Grove considers Saccardo's variety of *Phlyctaena phomatella* as pycnidia of *D. Ryckholtii* containing beta spores which are given by Saccardo as 20–22×1μ.

On Syringa:

Diaporthe resecans Nits. *Pyr. Germ.* (1870), 314.

On surface as minute blackened pustulate ruptures. Ostioles short, usually erumpent in small clusters. Surface of bark blackened about the erumpent ostioles or over the entire surface. Perithecia scattered or in small groups. Ventral zone present. Spores 11–14×2·5–4μ.

Host: *Syringa vulgaris.*

British collections: Plowr. *Sphaer. Brit.* II, 43. Cke, *Fung. Brit.* I, 492 (*Valsa Syringae*).

CONIDIAL CONNECTIONS:

Sphaeropsis depressa Lév. *Descr. Champ. d. L'Herb. Mus. Paris* (1846), 295.

Phoma resecans Sacc. in *Mich.* I (1878), 257.

P. depressa (Lév.) Sacc. in *Mich.* II (1880), 94.

Phomopsis depressa (Lév.) Trav. in *Fl. Ital. Crypt.* II (1906), 272.

Given by Saccardo as the conidial stage of *D. resecans.* Alpha conidia 10×2·5–3μ; "basidia" filiform-uncinate, 20–28×1·5μ.

On Tilia:

Sphaeria velata Pers. *Syn. Fung.* (1801), 32.

Diaporthe velata (Pers.) Nits. *Pyr. Germ.* (1870), 287.

Valsa pyreniostoma Auersw. in Herb. Nits.

Chorostate melaena Rehm in *Ann. Myc.* XI (1913), 152.

Diaporthe melaena (Rehm) Petr. *Fung. Pol.* 345 and *Myc. Carp.* (1917), 89.

D. velata f. *melaena* (Rehm) Petr. in *Hedw.* LXV (1925), 207.

Ostioles cylindric, usually erumpent in small definite clusters through small blackened pustulate ectostromata. Entostromatic areas widely extended, strongly differentiated. Dorsal blackening absent except about the ostioles or present and then often dipping slightly into the bark. Perithecia scattered, crowded or clustered, usually collectively erumpent. Ventral zone absent or present deep in the wood. Spores 11–13×2·5–3·5μ.

Hosts: *Tilia* spp.

British collections: **M.H.** 956, Shrawley Wood, Worcester, June, 1930.

This form has a well-developed entostroma and the dipping into the bark of the dorsal zone when it is present indicates the transition towards the pustulate-effuse species.

CONIDIAL CONNECTIONS:

Phoma velata Sacc. in *Mich.* II (1880), 96.

Phomopsis velata (Sacc.) v. Höhn. in *Sitz. Akad. Wiss. Wien,* CXV (1906), 681.

Nitschke gives the "spermatia" of his *D. velata* as fusoid 7–9×2μ, and the stylospores as filiform, hamate and 24–27×1μ. Saccardo describes a forma *minor* of his *P. velata* with alpha conidia 7–7·5×1·75–2μ, and "basidia" 10–14×1μ.

On Ulex:

Diatrype nucleata Curr. in *Trans. Linn. Soc. Lond.* XXII (1859), 270.
D. ligulata Nits. *Pyr. Germ.* (1870), 291.
D. nucleata (Curr.) Sacc. *Syll.* I (1882), 617.

On surface as pustulate blackened ruptures through which the sometimes elongated ostioles are erumpent singly or in small groups. Surface of bark blackened over wide areas and often exposed by loosening of the periderm. Ventral zones within the wood. Perithecia irregularly scattered. Spores 11–14×2·5–4μ.

Host: *Ulex europaeus.*

British collections: Plowr. *Sphaer. Brit.* 37. Cke, *Fung. Brit.* I, 455; II, 671. **M.H.** 976, 980, 981, Esher Common; Sugar Fen, King's Lynn; April to June: 977 to 979, 982 (Pycnidial), Ham Common; Malvern; March to June.

CONIDIAL CONNECTIONS:

Pycnidia found on Nos. 981, 982, 977 and 979 in the Mason Herbarium show pulvinate pycnidial stromata formed on the surface of the bark or wood which is heavily blackened. The stromata are white at first, becoming a greyish green and with a superficial blackened layer above. The locules are flattened and irregular. The alpha conidia are oblong to fusoid-ellipsoid, bi-guttulate, hyaline, one-celled, (5·5) 6·5–8·5×(1·5) 2–3μ. The beta conidia are slightly curved to definitely hamate, 10–21×1μ.

The pycnidia on No. 978 are of a different type, with a spherical cavity and ovoid to ellipsoid, one-celled, hyaline conidia which are smaller (2·5–3×1·5μ).

On Ulmus:

Sphaeria discutiens Berk. in Smith, *Eng. Fl.* V (1836), 245.
Diaporthe eres Nits. *Pyr. Germ.* (1870), 245.
Valsa Woolworthi Pk in *N.Y. St. Mus. Rep.* XXVIII (1876), 73.
Diaporthe Malbranchei Sacc. in *Mich.* I (1879), 509.
D. discutiens (Berk.) Sacc. *Syll.* I (1882), 677.
D. Woolworthi (Pk) Sacc. *Syll.* I (1882), 615.
D. ulmicola Ell. & Everh. in *Proc. Acad. Nat. Sci. Phil.* (1893), 141.

On surface as numerous, minute, pustulate ruptures through which the ostioles are erumpent singly or in small groups. Surface of bark more or less regularly blackened. Ventral zone present or absent.

Perithecia irregularly scattered or loosely grouped. Spores 9·5–14 × 2·5–4μ.

Host: *Ulmus campestris.*

British collections: **K**, Edinburgh, from Greville (*S. discutiens*). Plowr. *Sphaer. Brit.* II, 64 (*S. discutiens*). **M.H.** 1008, 1016 to 1027, Arundel; Ashtead; nr. Westwood Park, Worcester; Teme Valley, Worcester; April to October: 1028, 1094 to 1099, 1205 (pycnidial), Ashtead; Kew; Oscott College; Peebles; Piper's Hill Common; Richmond; September to May.

This is the typical form of this species and the type of the genus. The European specimens usually show a definite ventral zone in the wood, but this is usually lacking in American material.

CONIDIAL CONNECTIONS:

Phoma oblonga Desm. in *Ann. sci. nat.* sér. 3, XX (1853), 218.
P. eres Sacc. in *Mich.* I (1879), 521.
Phomopsis oblonga (Desm.) v. Höhn. in *Sitz. Akad. Wiss. Wien,* CXV (1906), 680.
Phoma Malbranchei Sacc. in *Mich.* I (1879), 521.

Nitschke describes the "spermatia" of *D. eres* as ellipsoid 6–7 × 3μ and the "stylospores" as filiform curved, 33 × 1μ. Cultures of *D. eres* made by me from ascospores on *Ulmus* produced *Phomopsis* pycnidia containing alpha conidia which were fusoid and 6–9 × 2–2·5μ and beta conidia which were filiform, hamate, 15–18 × 1μ. These measurements correspond to those obtained for the material of *P. oblonga* in the Mason Herbarium, the alpha conidia being (5) 6–8·5 (10) × (1·5) 2–3μ and the beta conidia 20–27 × 1μ. These beta conidia are longer than those obtained in culture, but the length of this type of spore is often quite variable. The pycnidia appear on the surface as minute pustulate ruptures caused by the small ectostromatic pycnidia formed on the bark surface. The bark surface is often blackened and the locules are usually flattened and irregular in shape. In No. 1205 the pycnidia are formed within the wood between the fibres and as a result have a quite characteristic structure, being long, fusoid, flattened stromata with a heavily blackened outer layer and a lighter coloured base, the pycnidium appearing on the surface as an isolated, fusoid, blackened spot.

Phoma oblonga is given as having elongate, elliptical alpha conidia, 6–7 × 3μ and this oblong character is typical of these conidia in Mason's material. Saccardo gave *P. eres* as having fusoid alpha conidia 10 × 3μ and beta conidia ("basidia") 15–18 × 2μ. Von Höhnel considers *P. ulmicola* Rich as a synonym of *P. eres*. *P. Malbranchei* is cited by Saccardo as the conidial stage of *D. Malbranchei*. The alpha conidia are given as ovoid-oblong, 14–15 × 5μ which suggests that it does not belong with this species.

NO HOST GIVEN:

Sphaeria quadrinucleata Curr. in *Trans. Linn. Soc. Lond.* XXII (1859), 325.
Diaporthe quadrinucleata (Curr.) Sacc. *Syll.* I (1882), 689.
Diatrype Badhami Curr. in *Trans. Linn. Soc. Lond.* XXII (1859), 270.
Diaporthe Badhami (Curr.) Sacc. *Syll.* I (1882), 635.

Although no hosts are given, the types of both these species are typical of *D. eres*. No setaceous appendages were seen on the spores of *Diatrype Badhami*, as described by Currey.

British collections: *S. quadrinucleata*: **K**, Herb. Currey, Weybridge, September, 1856; Eltham, January, 1855; from Plowright, 1873; December, 1872, on Ash. Non Plowr. *Sphaer. Brit.* I, 84.

S. Badhami: **K**, D. Badham, December, 1854; Herb. Cooke, September, 1859; non Fung. N.J. and Fung. N. Amer. No. 2595.

6. **Diaporthe medusaea** Nits.

Pyr. Germ. (1870), 251

Appearing on the surface as elongate-cylindrical or filiform sinuous ostioles which are erumpent, singly or variously aggregated in loose clusters. Bark surface in some forms heavily blackened, in others not at all blackened. Perithecia 200–500μ in diameter, irregularly scattered or tending to be in groups or crowded clusters, often forming pustulate swellings. Ventral zone present or absent. Asci clavate with a refractive ring in the apex and 40–47 × 6–9μ. Spores biseriate, hyaline, two-celled, fusoid-ellipsoid, 10–15 × 2·5–3·5μ.

Under this species are grouped a number of host forms which are characterised by the tendency of the ostioles to become elongate, filiform or often sinuous, so differing from *D. eres*. This tendency is sometimes accompanied by a heavy blackening of the bark surface and a crowding of the perithecia. Many intermediate forms exist and the elongation of the ostioles does not always occur. The species, therefore, is at times difficult to distinguish, and some specimens might easily be considered as a variety of *D. eres*. There is a rather distinct group of host forms, however, which are separated out here for convenience. So far, I have records of this species in Great Britain only from *Fagus*, though it probably occurs on other hosts.

On Fagus:

Valsa faginea Curr. in *Trans. Linn. Soc. Lond.* XXII (1859), 281.
Diaporthe macrostoma Nits. *Pyr. Germ.* (1870), 284.
D. faginea (Curr.) Sacc. *Syll.* I (1882), 619.

On surface as pustulate clusters of fine filiform sinuous ostioles. Surface of bark irregularly blackened. Ventral zone present or absent.

Perithecia usually in large crowded clusters or sometimes scattered. Spores often somewhat inequilateral, 11–14×2·5–3·5μ.

Host: *Fagus* sp.

British collections: **K**, Herb. Currey, Eltham Grove, October, 1856.

CONIDIAL CONNECTIONS:

Phomopsis Diaporthes-macrostomae (Nits.) Trav. in *Fl. Ital. Crypt.* II (1906), 280.

Nitschke describes the "spermatia" of *D. macrostoma* as fusoid, 8–9×3μ and the "stylospores" as filiform, hamate and 32–36×1μ.

7. **Diaporthe spiculosa** (Alb. & Schw.) Nits.

Pyr. Germ. (1870), 256

On surface as compact, circular pustulate discs of cylindrical ostioles which are occasionally elongate and sinuous. Stromata widely effuse. Dorsal blackening absent, or present as an evenly effuse blackening of the bark surface or as a slightly pustulate dorsal zone. Ventral zone usually absent or faint, rarely definitely present. Perithecia 200–500μ in diameter, thickly scattered or, more usually, clustered in small groups, often in slightly pustulate areas beneath small ectostromata and collectively erumpent. Asci clavate with a refractive ring in the apex, 40–47×6–9μ. Spores biseriate, ellipsoid-fusoid, two-celled, hyaline, 12–15×2·5–4μ.

This species differs from *D. eres* in the more definitely clustered perithecia, more definite ostiolar discs and the sometimes slightly pustulate dorsal zone. It is also rather difficult to separate but indicates the next step in the pustulate organisation of the stromata and the formation of definite ostiolar discs. Records of this species are also limited to one host genus.

On Sambucus:

Sphaeria spiculosa Alb. & Schw. *Consp. Fung. Nisk.* (1805), 16.
S. circumscripta Fr. in *Ann. sci. nat.* sér. 2, 1 (1834), 298.
Valsa circumscripta Mont. *Syll. Pl. Crypt.* (1856), 220.
V. tortuosa Fuck. *Enum. Fung. Nass.* (1860), 55.
Diaporthe spiculosa (Alb. & Schw.) Nits. *Pyr. Germ.* (1870), 256.
D. leucostroma Nits. in *Fung. Rhen.* (1867), 1989.
D. circumscripta Otth in Fuck. *Symb. Myc.* (1869), 207.
D. Robergeana f. *Sambuci* Feltg. *Vorst. Pilz. Lux.* Nachtr. II (1901), 125.

On surface as small circular pustulate discs containing a small cluster of cylindric ostioles which are sometimes elongate-sinuous. Dorsal zone absent or present and then sometimes dipping slightly into the bark. Perithecia thickly scattered, usually tending to be

clustered and collectively erumpent. Ventral zone usually absent, rarely present in the wood. Spores 10–14×2·5–4μ.

Host: *Sambucus nigra.*

British collections: Plowr. *Sphaer. Brit.* III, 39.

CONIDIAL CONNECTIONS:

Phoma sambucella Sacc. *Syll.* III (1884), 71.
Phomopsis sambucella (Sacc.) Trav. in *Fl. Ital. Crypt.* II (1906), 244.
Phoma sambucina Sacc. in *Mich.* II (1880), 97.
Phomopsis sambucina (Sacc.) Trav. in *Fl. Ital. Crypt.* II (1906), 269.

P. sambucella is given as the imperfect stage of *D. spiculosa.* The conidia are oblong-ovoid, 8×3–4μ. *P. sambucina* is regarded by Traverso as the conidial stage of *D. circumscripta.* The conidia are described as oblong fusoid, 8–10×3μ. Material in the Mason Herbarium (Nos. 946; 947 and 948) shows a *Phomopsis* on *Sambucus* causing small perforations of the bark or at times almost entirely concealed. Pycnidial stromata are formed in the bark or on the surface of the wood and the wood surface is heavily blackened forming a dorsal zone. The pycnidial cavities are rounded or flattened and irregular and contain alpha conidia which are fusoid-ellipsoid, 5·5–9·5×1·5–2·5μ. Only a few beta conidia were seen but these were filiform, slightly curved to hamate, and 16·5–25×1μ. The alpha conidia are somewhat broader than those given for the above species, but this *Phomopsis* probably belongs to *D. eres.*

8. **Diaporthe pulla** Nits.

Pyr. Germ. (1870), 249

Sphaeria spiculosa Fr. et Auct. pro parte.
S. spiculosa Fuck. *Enum. Fung. Nass.* (1860), 77.

On the surface as scattered or loosely clustered, cylindrical to sinuous filiform, shiny black ostioles, emergent through small breaks in the periderm, or, where the periderm is sloughed off, through the blackened bark surface. Entostroma irregularly pustulate-effuse, strongly differentiated. Dorsal zone irregularly pustulate, but bark tissues above entostromatic areas decaying away so that the blackened zone appears to be on the surface. Ventral zone deep in the wood or along the pith, easily overlooked. Perithecia 400–600μ in diameter, irregularly scattered or loosely clustered. Asci clavate, 35–45×5–6·5μ. Spores biseriate, narrow fusoid-ellipsoid, two-celled, hyaline, 9–13×2–2·5μ.

Host: *Hedera Helix.*

British collections: Vize, *Micr.-Fung. Brit.* 594. **M.H.** 749, Arundel, October, 1928.

This species is very similar to *D. eres* but differs in the elongate

ostioles, the narrower spores and the more pustulate dorsal zone. It is rather doubtful whether both these species exist on *Hedera* although some forms have the structure of *D. eres*; they may all be variations of *D. pulla*.

CONIDIAL CONNECTIONS:

Phoma Hederae Desm. in Fuck. *Symb. Myc.* (1869), 211.
P. pulla Sacc. in *Mich.* II (1880), 96.
Phomopsis pulla (Sacc.) Trav. in *Fl. Ital. Crypt.* II (1906), 244.

Fuckel gives *P. Hederae* as the pycnidial stage of *D. pulla*. He described the "spermatia" as oblong-lanceolate, $6\times3\mu$. Saccardo gives *P. Hederae* Fuck. non Desm. as a synonym of his *P. pulla* and describes the conidia as being $8\times2\mu$.

9. **Diaporthe Hederae** sp.nov.

Seen mostly as decorticated areas of widely effused heavily blackened areas of the wood. Visible through the bark only as scattered exposed areas of this blackening or as isolated elongate ostioles. Perithecia large, 400–750μ in diameter, scattered singly within the wood and erumpent separately as conical to short cylindric or elongate sinuous ostioles. Perithecia often causing small papillate swellings on the surface. Ventral zone present deep in the wood or as a blackening of the pith when the entire stem is entostromatic. Entostroma widely effuse, softening and discolouring the wood a yellowish white. Asci clavate to cylindric with a refractive ring in the apex, $50–60\times6–8\mu$. Spores biseriate to oblique uniseriate, broad fusoid-ellipsoid, hyaline, two-celled, constricted at the septum, at maturity, two-guttulate, $10–12{\cdot}5\times3{\cdot}5–5\mu$.

Host: *Hedera Helix*.

British collections: **M.H.** 751, Box Hill, Surrey, July, 1930.

This species is very similar in structure to *D. Sarothamni* var. *Dulcamarae* but has shorter and broader spores. The spores are similar to those of *D. Kolreuteriae* but the dorsal zone of that species is fine and pustulate effuse instead of a heavy effuse surface blackening as in this species.

A second collection (**M.H.** 750, Arundel, June, 1930) on Ivy shows a structure identical with the above species but the perithecia found in the wood contain different spores which are one-celled at first, becoming two- then four-guttulate and apparently are finally three-septate and are $14–20\times4–6\mu$. The relation of these perithecia, if any, is not clear and further material for study of this species is desirable.

Diaporthe Hederae sp.nov. Late effusa in areis valde nigricantibus decorticatis *Hederae Helicis*, in areis nondum decorticatis solum per rimas

obvia vel fortasse ostiola elongata per corticem penetrantia. Perithecia magna, 400–750μ diam. singulatim ex ligno ostiolis conicis brevicylindricis vel elongate sinuosis erumpentia. Zona ventralis profunde in ligno posita hucusque ad medullam nigricantem in caulibus totaliter entostromaticis. Entostroma late effusum, lignum disintegratum albidoluteum discolorans. Asci clavati vel cylindrici apice annulum refractivum praediti, 50–60 × 6–8μ. Sporae biseriatae vel obliquiter uniseriatae, late fusoideo-ellipsoidales, hyalinae, bicellulae, ad septum maturitate constrictae, bi-guttulatae, 10–12·5 × 3·5–5μ. Collectio typica in Herb. Univ. Mich., *E. W. Mason No.* 751, Box Hill, England.

Structura similis *D. Sarothamni* var. *Dulcamarae* sed differt sporis brevioribus latioribusque. Sporis *D. Kolreuteriae* similis sed zona dorsalis in *D. Hederae* valde effusa superficialis nec tenuis pustulato-effusa.

10. **Diaporthe Sarothamni** (Auersw.) Nits.

Pyr. Germ. (1870), 303

? *Sphaeria tetragona* Duby *Bot. gall.* II (1830), 703.
? *S. interrupta* Mont. & Fr. in *Ann. sci. nat.* sér. 2, I (1834), 295.
? *Diatrype interrupta* Mont. & Fr. *Syll. Crypt.* (1856), 218.
Valsaria Sarothamni Auersw. *in litt.* in Herb. Nits.

On surface as numerous minute, pustulate, erumpent, blackish elliptical to circular discs through which 1–3 small ostioles are barely erumpent. Entostromata evenly effuse, strongly differentiated, often somewhat limited in extent (1–5 cm.). Dorsal blackening mostly absent, when present often dipping slightly into the bark. Ventral zone present within the wood, sometimes incomplete beneath. Perithecia flattened spherical, 320–720×240–350μ, irregularly scattered or loosely grouped in bark or wood. Asci clavate 45–58 × 7–14μ. Spores biseriate, fusoid-ellipsoid, two-celled, hyaline, constricted at the septum, 13–16 (17)×3–4 (4·5)μ.

I have not seen this species from Great Britain, although it may occur; the following variety occurs.

var. **Dulcamarae** (Nits.) Wehm.

Gen. Diap. (in press).

Diaporthe Dulcamarae Nits. *Pyr. Germ.* (1870), 250.

On surface as numerous short cylindric ostioles, erumpent singly or in loose groups of 2–3. Entostromata widely effuse. Surface of bark or wood usually heavily blackened. Ventral zone deep in wood or often along the margin of the pith. Perithecia 400–600 × 300–400μ, scattered singly, usually imbedded in the wood, and often causing slight pustulate swellings. Asci clavate with refractive ring in the apex,

52–60 × 8–9μ. Spores biseriate, fusoid-ellipsoid, two-celled, hyaline, 13–15 (17) × 2·5–4 (5)μ.

Host: *Solanum Dulcamara.*

British collections: Plowr. *Sphaer. Brit.* III, 36.

D. Dulcamarae appears to be a variety of *D. Sarothamni* occurring on stems with a less well-developed bark tissue, resulting in more scattered perithecia and separately erumpent ostioles which are not definitely grouped in ectostromatic discs as in *D. Sarothamni*. The dorsal blackening is also much heavier in var. *Dulcamarae*.

CONIDIAL CONNECTIONS:

Phoma Dulcamarae Sacc. in *Mich.* II (1881), 272.

Phomopsis Dulcamarae (Sacc.) Trav. in *Fl. Ital. Crypt.* II (1906), 247.

Saccardo gives the conidia of his *Phoma* as fusoid, 8–10 × 2μ and the "basidia" as filiform-hamate, 25 × 1·5μ. Pycnidia in Syd. *Myc. March.* 3730 contain rod-shaped hyaline conidia, 5·5–7·5 × 1·5μ. This seems to be the *Sclerophoma solanicola* of von Höhnel (*Hedw.* LIX (1917), 242), the conidia of which are cited as cylindric and 5–7 × 2–3μ.

11. **Diaporthe decedens** (Fr.) Fuck.

Symb. Myc. Nachtr. I (1871), 30

Sphaeria tessella Pers. *Syn. Fung.* (1801), 8.
S. decedens Fr. in Kze, *Myc. Hefte*, II (1823), 49.
Dialytes decedens (Fr.) Nits. in Fuck. *Fung. Rhen.* 1983.
Wuestneia tessera Auersw. in Fuck. *Fung. Rhen.* (1863), 592.
Diaporthe tessera Fuck. *Symb. Myc.* Nachtr. I (1871), 30.
Chorostate tessera (Fr.) Trav. in *Fl. Ital. Crypt.* II (1906), 209.

When young, appearing on the surface as numerous, small, circular, pustulate, ectostromatic discs, 0·2–0·4 mm. in diameter. As the perithecia mature these discs decay and fall away leaving circular perforations about which the papillate ostioles become separately erumpent through the surrounding periderm, forming scattered groups about a central disc. These ostioles may also be scattered singly as minute pustules over the surface of the twig. There is no blackened zone (normally) in either wood or bark. Perithecia spherical or flattened, 480–720 × 320–480μ, in loose clusters or scattered singly, but always separately erumpent. Asci clavate with a refractive ring in the apex and 68–85 × 10–15μ. Spores ellipsoid-fusoid, two-celled, hyaline, constricted at the septum, acute at the ends and variable in size. When young the spores are 13–18 × 3·5–4·5μ, but when fully mature they are 14–22 × 4–5μ. Faint hyaline appendages are sometimes present on these spores, especially when immature, but these are not a constant character.

Host: *Corylus Avellana.*

British collections: **M.H.** 394, Bristol; 393, 395, 396, 447 to 452, Ashtead, October to June.

The above collections from Ashtead are very interesting in that they show a distinct form of *D. decedens* with all intermediate gradations between it and the typical form. When first seen this form was considered to be a distinct species on *Corylus* and apparently has been described as such under the name of *Diaporthe conjuncta* (Nees) Fuck. (*Symb. Myc.* (1869), 206). Various exsiccata of *D. conjuncta* examined by the writer include some five different species of *Diaporthe* among which are several collections of *D. decedens*. The type material (Fuck. *Fung. Rhen.* (1867), 1971), however, shows pustules which are almost identical with the form here mentioned. This form of *D. decedens* is characterised by the very definitely organised pustulate stromata with definite ectostromatic discs through which the ostioles are collectively erumpent. Its identity with the typical form is concluded from the presence of all intermediate conditions in one and the same collection and even on the same twig. Where this form occurs alone on a stem, however, it appears to be quite distinct.

forma **conjuncta** (Nees) comb.nov.

Sphaeria conjuncta Nees *Syst. d. Pilze* (1817), 305.
Valsa conjuncta Nees in Fuck. *Fung. Rhen.* (1867), 1971.
Diaporthe conjuncta (Nees) Fuck. *Symb. Myc.* (1869), 206.

On surface as hemispherical to conical pustules 0·5–1·5 mm. in diameter with a central, circular to fusoid, laterally elongate, ectostromatic disc, through which a cluster of hemispherical to short cylindric ostioles are collectively erumpent. Perithecia large, 350–750×350–500μ, definitely clustered beneath a well-developed, yellowish to greyish ectostroma. No blackened zones present in the substratum. Bark surface sometimes blackened above the perithecia. Asci clavate, 58–70 × 8–10μ. Spores two-celled, hyaline, fusoid-ellipsoid, often inequilateral, with or without a slight median constriction, 2–4 guttulate, 13·5–18·5 × 4–5·5μ. No appendages seen.

In this form, *D. decedens* has the structure of a typical *Melanconis* but other specimens have been seen with a marginal blackened zone, all of which make it a variable, intermediate and puzzling species.

CONIDIAL CONNECTIONS:

In ascospore cultures, I have obtained *Phomopsis*-like stromata and two types of conidia (*Mycologia*, XIX (1927), 174). The alpha conidia were ellipsoid-fusoid to elongate-fusoid, straight, one-celled, hyaline, 11–15×2–2·5μ and the beta conidia were narrow-cylindric, hyaline, one-celled, somewhat curved or allantoid, 8–13 (15)×1–1·5 (2) μ.

This is the imperfect stage of *Diaporthe* rather than a *Melanconis*.

12. **Diaporthe oncostoma** (Duby) Fuck.

Symb. Myc. (1869), 205

Sphaeria oncostoma Duby in Rab. *Fung. Eur.* (1856), 253.
Valsa enteroleuca Curr. in *Trans. Linn. Soc. Lond.* XXII (1859), 275.
Diaporthe fasciculata Nits. *Pyr. Germ.* (1870), 247.
Valsa oncostoma (Duby) Cke, *Handb. Brit. Fung.* II (1871), 834.
V. personata Cke & Ell. in *Grev.* VII (1878), 9.
D. enteroleuca (Curr.) Sacc. *Syll.* I (1882), 612.
D. personata (C. & E.) Sacc. *Syll.* I (1882), 612.
D. dolosa Sacc. & Roum. in *Rev. Myc.* V (1883), 234.
Chorostate oncostoma (Duby) Trav. in *Fl. Ital. Crypt.* II (1906), 197.

Appearing on the surface as more or less pustulate ruptures or perforations of the periderm through which the short stout cylindric ostioles are erumpent in small loose clusters or somewhat larger irregular groups. Pycnidial ectostromata often present forming papillate pustules which are later open to the exterior. Entostroma strongly differentiated from the colour of the wood, characteristically pustulate effuse, but pustulate areas sometimes crowded, confluent and appearing somewhat evenly-effuse, usually widely extended, but sometimes limited in area and including only one or a few pustules. Dorsal zone definite, dipping into the bark between the perithecial clusters. Ventral zone usually definite and complete beneath, but often interrupted or present only at the lateral margins. Perithecia 350–600 × 350–550μ, in more or less definite clusters within the pustulate areas, occasionally irregularly scattered. Asci clavate with a refractive ring in the apex, 60–80 × 6–9μ. Spores biseriate, rather narrow fusoid-ellipsoid, two-celled hyaline, constricted at the septum, 13–17 (25) × 3–4μ.

Host: *Robinia Pseudacacia.*

British collections: Cke, *Fung. Brit.* II, 240.

This species is common on *Robinia* wherever this host is found. *Sphaeria enteroleuca* is a confused species, but Currey's conception of this species which he names *Valsa enteroleuca* is *D. oncostoma* as is shown by his description and figures. Under favourable conditions, the spores of this species may become very much elongated. A specimen in von Höhnel's Herbarium (A. 4022, May, 1916) has spores 13–20 × 2·5–4μ and material collected by me and matured in a damp chamber produced spores 16–20 (27) × 4μ.

CONIDIAL CONNECTIONS:

Phoma petiolorum Desm. in *Ann. Sci. nat.* sér. 3, VIII (1847), 16.
Sphaerocista Robiniae Preuss in *Linnaea*, XXV (1852), 734.
Phoma oncostoma Thüm. *Myc. Univ.* 877.
Cytispora abnormis B. & C. in *Grev.* II (1874), 98.

Naemospora Russelii B. & C. in *Grev.* II (1874), 157.
Cytospora orthospora B. & C. in *Grev.* II (1874), 98.
Fusicoccum Farlowianum Sacc. & Roum. *Rel. Lib.* IV (1884), 98.
Phoma Pseudacaciae Sacc. *Syll.* III (1884), 69.
Myxosporium Russelii (B. & C.) Sacc. *Syll.* III (1884), 722.
Phoma Robiniae (Pr.) Sacc. *Syll.* III (1884), 69.
Phomopsis oncostoma (Thüm.) v. Höhn. in *Sitz. Akad. Wiss. Wien*, CXV (1906), 681.
P. Pseudacaciae (Sacc.) v. Höhn. in *Sitz. Akad. Wiss. Wien*, CXV (1906), 690.
Cytospora Robiniae Schw. pro parte in Herb. (see Grove in *Kew Bull.* (1919), 178).
Phomopsis petiolorum (Desm.) Grove in *Kew Bull.* (1917), 60.

The above synonymy is taken from von Höhnel (*Sitz. Akad. Wiss. Wien*, CXXVI (1917), 394) and Grove (*Kew Bull.* (1917), 60). The "spermatia" of *D. oncostoma* are given by Fuckel as oblong-lanceolate, 10×2–3μ. Nitschke cites them as 8–$10 \times 2{\cdot}5$–3μ and gives the "stylospores" as filiform, curved, 20–22 $(24) \times 1\mu$. *Phomopsis*-type pycnidia, formed in ascospore cultures, contained fusoid-ellipsoid alpha conidia which were 8–10×2–$2{\cdot}5\mu$. Beta conidia in such pycnidia were filiform, hamate, hyaline, 13–22×1–$1{\cdot}5\mu$ (*Papers Mich. Acad. Sci.* III (1929), 247).

13. **Diaporthe Crataegi** (Curr.) Nits. in litt. ad Fuck.

Symb. Myc. (1869), 204

Valsa Crataegi Curr. in *Trans. Linn. Soc. Lond.* XXII (1859), 278.
Pseudovalsa (*Valsaria*) *Crataegi* Cke in *Grev.* XIV (1885), 48.
Chorostate Crataegi (Curr.) Trav. in *Fl. Ital. Crypt.* II (1906), 197.

Appearing on the surface as small pustulate ruptures of the periderm which expose a minute blackened disc, 0·2–0·8 mm. in diameter and containing the few cylindrical ostioles. Entostromata pustulate-effuse, occasionally isolated. Dorsal zone dipping between the perithecial clusters into the bark or wood. Ventral zone absent or very faint and irregular. Perithecia spherical, flattened or irregular from crowding, 240–800×160–480μ, clustered in the differentiated pustulate areas, collectively erumpent. Very little, if any, ectostromatic development present in the mature disc. Asci clavate with a refractive ring in the apex, 67–95×10–12μ. Spores biseriate, oblong-ellipsoid, two-celled, hyaline, constricted at the septum, often somewhat curved when young, 15–$18 \times 4{\cdot}5$–$5{\cdot}5\mu$. Spores apparently with an outer gelatinous sheath, probably of periplasm, which makes the separation of spores in old material difficult.

Host: *Crataegus Oxyacantha*.

British collections: Cke, *Fung. Brit.* I, 380. Plowr. *Sphaer. Brit.* II, 36.

This species appears to be entirely European in its distribution, all American specimens examined being *D. eres*. It is represented in America on *Crataegus* by the related species *D. aliena*, which has shorter and broader spores and more strongly pustulate dorsal zones.

14. **Diaporthe pustulata** (Desm.) Sacc.

Syll. I (1882), 610

Sphaeria pustulata Desm. in *Ann. sci. nat.* sér. 3, VI (1846), 70.
Aglaospora pustulata (Desm.) Tul. *Sel. Fung. Carp.* II (1863), 163.
Valsaria Fraxini Hazsl. in Herb. Nits.
Diaporthe fraxinea Nits. in litt. ad Hazsl. in Herb. Nits.
D. Niesslii Sacc. (non Kze) in *Mich.* I (1871), 391.
D. Zopfii Kze in *Fung. Sel.* (1878), 264.
Calospora Zopfii (Kze) Sacc. *Syll.* II (1883), 232.
Chorostate Niesslii (Sacc.) Trav. *Fl. Ital. Crypt.* II (1906), 196.

On surface as truncate conical or angular pustules with a central blackened disc through which a small cluster of stout cylindric ostioles are erumpent. Often each pustule is surrounded by a slightly raised or blackened ridge caused by the abutting of the ventral zone upon the periderm at the margin of the entostroma. Entostromata strongly differentiated, limited in area, usually isolate in character containing a single perithecial cluster, but often with two or more pustules within a single entostromatic area. Dorsal blackening absent except on the surface of the blackened entostromatic disc. Ventral zone definite within the wood. Perithecia 250–640μ in diameter, in definite clusters, collectively erumpent. Asci clavate with a refractive ring in the apex, 67–80 × 6–8μ. Spores biseriate, fusoid-ellipsoid, two-celled, hyaline, slightly constricted at maturity, 12–15 (16) × 2–4 (5) μ.

Host: *Acer Pseudo-platanus*.

British collections: **M.H.** 187, Llanbedr, Wales, September, 1924; 188 and 192, Bristol, October, 1929; 189 (pro parte); 190, King Thorpe Wood, September, 1930; 191, Grabhurst, Minehead, March, 1927.

This is one of a group of species on *Acer* which are apparently limited to certain species of that host genus. *D. pustulata* differs from the American species (*D. acerina* and *D. dubia*) in the more isolate character of the stromata and the outlining ridge which is often visible on the surface of the substratum. *D. varians*, on *Acer campestris* in Europe, differs in the inequilateral or curved ascospores.

CONIDIAL CONNECTIONS:

Phoma pustulata Sacc. *Syll.* III (1884), 91.
Phomopsis pustulata (Sacc.) Died. in *Ann. Myc.* IX (1911), 28.

The Tulasnes (*Sel. Fung. Carp.* II (1863), 163) give the "stylospores" of their *Aglaospora pustulata* as ovoid, 10–13 × 3·5μ and the "spermatia" as 25–35μ in length. Saccardo describes the "basidia" of his *P. pustulata* as filiform, hamate, 14μ long.

15. **Diaporthe varians** (Curr.) Sacc.

Syll. I (1882), 614

Diatrype (*Valsa*) *varians* Curr. in *Trans. Linn. Soc. Lond.* XXII (1859), 270.
Dialytes Aceris Fuck. *Fung. Rhen.* (1867), 1984.
Diaporthe Aceris Fuck. *Symb. Myc.* (1869), 204.

On the surface as flattened conical pustules with a small central cluster of short, stout, barely erumpent ostioles. Entostromata isolate to pustulate-effuse in character. Dorsal zone dipping into the bark. Ventral zone definitely present in bark or wood. Perithecia 320–640 × 240–480μ, definitely clustered in the pustulate areas and collectively erumpent. Asci clavate, 60–70 × 10–12μ. Spores biseriate, fusoid-ellipsoid, usually characteristically inequilateral or curved, two-celled, hyaline, not at all or only slightly constricted at the septum, 13·5–19 × 4–6·5μ.

Host: *Acer campestris.*

British collections: **K**, Herb. Berkeley 1612 (*Sphaeria varians*).

Only two collections of this species have been seen. The spores in Berkeley's specimen are 15–19 × 5–6·5μ. Those in the second collection (Fuck. *Fung. Rhen.* 1984) are 13·5–16 × 4–5·5μ. These two specimens probably represent the range of spore size and are one and the same species.

16. **Diaporthe inaequalis** (Curr.) Nits.

Pyr. Germ. (1867), 285

Sphaeria inaequalis Curr. in *Trans. Linn. Soc. Lond.* XXII (1859), 270.
Diatrype inaequalis Berk. & Br. in *Ann. Mag. Nat. Hist.* ser. 3, III (1859), 363.
Sphaeria Fuckelii Duby in litt. in Fuck. *Fung. Rhen.* (1864), 919.
Melanconis castri-labatii Speg. *Dec. Myc. Ital.* (1879), 90.
Sphaeria neglecta Duby inedit. in Herb. Curr.
Valsa neglecta Duby in *Grev.* XIV (1885), 47.
Diaporthe neglecta (Duby) Berl. & Vogl. *Syll. Add.* (1886), 188.

Appearing on the surface as small pustulate stromata, 0·2–0·5 mm. in diameter and erumpent through the adherent periderm as small clusters of short, stout, cylindric or sometimes elongate or bent ostioles. Entostroma pustulate-effuse, dorsal zone running along or just beneath the bark surface and dipping into the bark or wood between the

perithecial groups. Perithecia flattened spherical, rather large, 450–720 × 240–500μ, scattered singly, clustered in small groups, or crowded in large clusters, usually collectively erumpent. Ventral zone absent or present as a broad brownish zone well within the wood. Asci clavate at first, becoming cylindrical at maturity, varying in size from 70–110 × 9–15μ. Spores biseriate, becoming obliquely uniseriate to uniseriate, broadly ellipsoid, hyaline, two-celled, constricted at the septum, composed of two almost isodiametric cells, each with a single large globule and measuring (12) 13–17 (18) × 5·5–9μ.

Hosts: *Cytisus* sp., *Ulex* sp.

British collections: Cke, *Fung. Brit.* I, 372 (*Diatrype inaequalis*). **M.H.** 975, Sugar Fen, King's Lynn, June, 1930.

The broad brownish ventral zone in the wood is quite characteristic of this species. It is also found on *Genista* and *Amorpha*, on the smaller twigs of which hosts the stromata are more pustulate and the ostioles more prominent. The ventral zone is normally absent on such small twigs.

CONIDIAL CONNECTIONS:

Phoma inaequalis Speg. *Fung. Arg. Pug.* II (1880), 128.
Phomopsis inaequalis (Speg.) Trav. in *Fl. Ital. Crypt.* I (2) (1906), 259.

Nitschke gives the conidia of *D. inaequalis* as filiform, curved, 21–27 × 2μ. Spegazzini describes the conidia of his *P. inaequalis* as ellipsoid-elongate, inequilateral, 7–10 × 2–3μ. These probably represent the beta and alpha conidia respectively of this species.

17. **Diaporthe syngenesia** (Fr.) Fuck.

Symb. Myc. (1869), 204

Sphaeria Frangulae Pers. in Herb. Kew (?) Cooke.
S. syngenesia Fr. *Syst. Myc.* II (1823), 382.
Valsa syngenesia Fr. *Sym. Veg. Sc.* (1849), 411.
Diatrype Frangulae (Pers.) Cke, *Handb. Brit. Fung.* II (1871), 816.
D. syngenesia Curr. in Cke in *Seem. Journ. Bot.* IV (1866), 99.
Valsa appendiculata Auersw. in Fuck. *Fung. Rhen.* (1863), 601.
Diaporthe Berlesiana Sacc. & Roum. in *Rev. Myc.* V (1883), 234.
Chorostate syngenesia (Fr.) Trav. in *Fl. Ital. Crypt.* II (1906), 206.
C. Berlesiana (Sacc. & Roum.) Trav. in *Fl. Ital. Crypt.* II (1906), 196.

Erumpent as more or less pustulate, circular to fusoid discs, 0·5–1 mm. in diameter and composed of a compact cluster of stout cylindrical ostioles. Entostromatic areas pustulate-effuse with the dorsal zone dipping to the wood between the pustules, or with the pustulate areas more or less confluent. There is a well developed ectostromatic disc of brown hyphae and the entire entostromatic areas are filled

with a growth of these, which blacken the host tissue. No ventral zones in either the bark or wood. Perithecia 250–480 × 240–320μ, clustered within the pustulate stromatic areas. Asci clavate, 47–54 × 6–8μ. Spores biseriate, ellipsoid-oblong to fusoid-ellipsoid, two-celled, hyaline, constricted at the septum, 12–13·5 × 2–3·5 (4) μ and rarely with faint hyaline appendages, which are quickly evanescent.

Host: *Rhamnus Frangula.*

British collections: **M.H.** 888, Wicken Fen. Cambridge, August, 1930 (non Cke, *Fung. Brit.* II, 222 (*V. syngenesia*)); Plowr. *Sphaer. Brit.* II, 21 (*D. Frangulae*); Cke, *Fung. Brit.* I, 367 (*V. appendiculosa*).

When the pustulate stromata are numerous and confluent, this species is easily confused with *D. eres* on *Rhamnus* (*D. nigricolor*). It can usually be distinguished, however, by the pustulate entostromata and the definitely disc-like clusters of ostioles and the lack of a ventral zone. It differs from *D. detrusa* and *D. fibrosa* in the much narrower spores.

CONIDIAL CONNECTIONS:

Phoma syngenesia Brun. in *Act. Soc. Linn. Bord.* (1890), 57.
P. Frangulae Oud. in *Hedw.* XXXVII (1898), 314.
Fusicoccum moravicum Bub. in *Ann. Myc.* XIII (1915), 28.
Phomopsis moravica (Bub.) Petr. in *Fl. Boh. and Mor.* (1919), 1064.
P. syngenesia (Brun.) v. Höhn. in *Ber. Deut. Bot. Ges.* XXXV (1917), 255.

The connection was pointed out by von Höhnel in 1917. The above synonymy is taken from Petrak (*Hedw.* LXII (1921), 305). Bubák gives the conidia as cylindrical to oblong-cylindric, straight or curved, 6–11 × 2–3·5μ. Traverso suggests *Myxosporium Rhamni* All. as the imperfect stage of *D. syngenesia.*

18. **Diaporthe strumella** (Fr.) Fuck.

Symb. Myc. (1869), 205

Sphaeria strumella Fr. *Syst. Myc.* II (1823), 365.
S. versatilis Fr. *Syst. Myc.* II (1823), 364.
Diatrype strumella Fr. *Sum. Veg. Sc.* (1849), 385.
Sphaeria strumellaeformis de Not. *Micr. Ital. Dec.* VIII (1850), 119.
Valsa strumella (Fr.) Fuck. *Fung. Rhen.* (1863), 598.
Diaporthe mitis Sacc. in *Mich.* II (1880), 61.
D. strumellaeformis (de Not.) Sacc. *Syll.* I (1882), 614.
D. spiraeaecola Feltg. *Vorst. Pilz-Fl. Lux.* Nachtr. III (1903), 147.
Chorostate strumella (Fr.) Trav. in *Fl. Ital. Crypt.* II (1906), 199.

Visible on the surface as scattered, pustulate, circular or laterally elongated, blackened, stromatic discs, 0·5–2 × 0·2–1 mm. The flat blackened discs contain scattered papillate to conical ostioles or are

nearly obliterated by a dense fascicle of ostioles which are occasionally much elongated or bent. Perithecia spherical to ovoid, 250–400μ in diameter, definitely clustered beneath a strongly developed ectostroma. There are usually no darkened zones visible in either bark or wood. This is on account of the obscurity of the dorsal zone which runs between the bark and the wood and of the entostromatic character of the entire woody tissue, so that any ventral zone is along the margin of the pith and not noticeable. Ventral zones sometimes definitely seen deep in the wood. Asci clavate with a refractive ring in the apex and measuring 37–45 × 6–9μ. Spores biseriate, fusoid, often somewhat inequilateral or curved, two-celled, hyaline, slightly constricted at the septum at maturity, 11–15 (16) × 2–3 (3·5) μ.

Hosts: *Ribes* spp.

British collections: Berk. *Brit. Fung.* 173 (*S. strumella*). Plowr. *Sphaer. Brit.* I, 36 (*D. strumella*). Vize, *Micr.-Fung.* 157 (*D. strumella*). Cke, *Fung. Brit.* II, 670 (*D. strumella*).

This species is similar to *D. spiculosa* and *D. syngenesia* but the former species does not have the strongly pustulate nor the definite ectostromatic discs and the latter species causes a brownish discoloration of the host tissues.

CONIDIAL CONNECTIONS:

Ascospore cultures of *D. strumella* (*Mycologia*, XIX (1927), 178) have produced *Phomopsis*-like pycnidia containing one to several locules. Two types of conidia were produced on stems of *Ribes* in culture. The alpha conidia were fusoid-ellipsoid, 6–8 × 2·5μ: the beta conidia were long cylindric-fusoid, straight or slightly curved, 11–15 × 1·5μ.

19. **Diaporthe impulsa** (Cke & Pk) Sacc.

Syll. I (1882), 618

Valsa impulsa Cke & Pk *N.Y. St. Mus. Rep.* XXVII (1875), 109.
Diaporthe expatriata Rehm (?) in *Syd. Myc. March.* (1887), 1657.
D. strumelloides Rehm in Rab. *Fung. Eur.* (1890), 3753.
D. sorbicola (Nits.) Bref. *Unters. Mykol.* X (1891), 236.
D. Aucupariae Hazsl. *Sphaer. Hung.* (1892), 193.
D. Woroniniae Jacz. in *Bull. Soc. Imp. Nat. Moscou*, X (1897), 72.
D. congesta Ell. & Everh. in *Journ. Myc.* IX (1903), 165.

Appearing on the surface as pustulate conical stromata with central greyish to blackened discs, 1–1·5 mm. in diameter and containing a compact cluster of stout cylindric ostioles. Entostroma pustulate-effuse, the definite dorsal zone dipping into the bark between the perithecial clusters and bounding the lighter coloured pustulate areas. Ventral zone usually present, well within the wood. Perithecia 320–640 × 320–480μ, clustered within the pustulate areas beneath a

strongly developed, greyish, conical ectostroma, through which the ostioles are collectively erumpent. Asci clavate, 60–70 × 7–10μ. Spores biseriate, ellipsoid-fusoid, two-celled, hyaline, constricted at the septum, 13–18 × 2·5–5·5μ.

Host: *Pyrus Aucuparia.*

British collections: **M.H.** 806, King's Lynn, July, 1930.

This species is very similar to the American *D. Pruni* but differs in the shorter unappendaged ascospores. *D. Padi* differs in the lack of a well defined ectostroma and *D. pennsylvanica* in the longer ascospores. Intermediate forms between these various species are sometimes difficult to place.

CONIDIAL CONNECTIONS:

The conidial stage of this species has been obtained in culture (*Papers Mich. Acad. Sci.* IX (1929), 483). The alpha conidia are long fusoid, 15–27 × 2·5–5μ. The beta conidia are long cylindric, hamate or allantoid, 10–15 × 1–1·5μ. These conidia are very similar to, but distinctly longer than those of the related species *D. Pruni* (alpha 10–19 × 2·5–3μ; beta 10–15 × 1–1·5μ).

Bondarsew (*Not. syst. Inst. Crypt. Hort. Petropol.* I (1921), 84), has described *Phomopsis Caraganae* Bond. on *Caragana*, which has alpha conidia 13–18 × 3–3·5μ and beta conidia 14–20 × 1·5μ. This is given as the imperfect stage of *D. Woroniniae.* It may be the same as the *Phomopsis* obtained by me and merely represents an extreme of variation in the size of the conidia, but inasmuch as there is a second species, *D. Caraganae*, described on *Caragana* it would be desirable to have a further cultural comparison of these species before coming to any definite conclusions.

20. **Diaporthe fibrosa** (Pers.) Fuck.

Symb. Myc. (1869), 204

Sphaeria fibrosa Pers. *Syn. Fung.* (1801), 40.
S. extensa Fr. *Syst. Myc.* II (1823), 381.
Valsa fibrosa Fr. *Sym. Veg. Sc.* (1849), 411.
V. extensa Fr. *Sym. Veg. Sc.* (1849), 411.
Diaporthe extensa (Fr.) Sacc. *Syll.* I (1882), 618.
Chorostate fibrosa (Pers.) Trav. in *Fl. Ital. Crypt.* II (1906), 193.

Pustules variable in size, appearing on small twigs as small conical to fusoid pustules, 0·2–1 mm. in diameter with a central cluster of stout cylindric ostioles; on larger twigs forming larger fusoid to elliptic discs 1–2·5 × 0·5–0·5 mm. which rupture and throw back the periderm. The bark tissues are strongly blackened and disintegrated. Certain layers of stone cells and schlerenchyma tissue are not affected by this blackening and cause the characteristic fibrous appearance of

the infected bark. Entostromatic areas pustulate-effuse, compact, grey to black, and bounded by a dorsal zone which dips to the wood surface between the perithecial clusters, but is often difficult to distinguish on account of the blackened bark. There are no ventral zones. The perithecia are spherical to somewhat flattened, 480–720 × 320–720μ, and clustered in the pustulate areas beneath a well developed ectostroma through which the ostioles are erumpent. The asci are clavate, have a refractive ring in the apex and measure 80–95 × 8–10μ. Spores uniseriate to obliquely uniseriate, broad fusoid-ellipsoid, obtuse, two-celled, hyaline, constricted at the septum, with a single large guttula in each cell, 11–14 (16) × 6–8μ.

Host: *Rhamnus catharticus*.

British collections: Berk. *Brit. Fung.* 30 (*S. fibrosa*). Cke, *Fung. Brit.* II, 227 (*V. fibrosa*). **M.H.** 889, Bull's Bushes, Oakley, Hants, April, 1925; 890, Arundel, June, 1930.

This species is characterised by the dark coloration of the entostromata and the broad ellipsoid spores.

CONIDIAL CONNECTIONS:

Fusicoccum fibrosum Sacc. *Syll.* III (1884), 247.
Phomopsis fibrosa (Sacc.) v. Höhn. in *Sitz. Akad. Wiss. Wien*, CXV (1906), 681.

Saccardo gives the conidia of *Fusicoccum fibrosum* as ellipsoid, with an acuminate base, 11 × 5μ. A *Fusicoccum* accompanying *D. fibrosa* in Jaap's *Fung. sel.* No. 433 shows greyish ectostromata which contain fusoid to ellipsoid-oblong conidia measuring 6–11 × 2–2·5μ. A copy of Syd. *Myc. Germ.* No. 1100 in the N.Y. St. Mus., on the other hand, shows broad ellipsoid or pointed conidia, 8–13 × 3–5μ. These may represent the two types of conidia of a *Fusicoccum* or *Phomopsis*, but further cultural proof is certainly needed.

21. **Diaporthe leiphaemia** (Fr.) Sacc.

Myc. Ven. Spec. (1873), 135

Sphaeria leiphaemia Fr. *Syst. Myc.* II (1823), 399.
S. enteroleuca Fr. pro parte (?), *Syst. Myc.* II (1823), 381.
Valsa leiphaemia Fr. *Sym. Veg. Sc.* (1849), 412.
Sphaeria taleola Curr. (non Fr.) in *Trans. Linn. Soc. Lond.* XXII (1859), 276.
Cryptospora leiphaemia (Fr.) Fuck. *Symb. Myc.* (1869), 194.
C. dryophila Niessl in Rab. *Fung. Eur.* (1875), 1941.
Diaporthe dryophila (Niessl) Sacc. *Syll.* I (1882), 615.
Valsa fuscidula Cke in *Grev.* XIV (1885), 48.
Diaporthe Cerasi Feltg. (non Fuck.) *Vorst. Pilz-Fl. Lux.* Nachtr. II (1901), 124.

D. Feltgeni Sacc. & Syd. *Syll.* XVI (1902), 493.
Chorostate leiphaemia (Fr.) Trav. in *Fl. Ital. Crypt.* II (1906), 203.

First appearing upon the surface as hemispherical swellings caused by the formation, on the bark surface, of a well developed pulvinate ectostroma which soon ruptures the periderm in an angular fashion exposing an erumpent circular to angular or fusoid, orange-yellow to brownish disc which becomes cracked and roughened in age. Ostioles, for the most part, scarcely or only slightly erumpent, but sometimes strongly erumpent as stout cylindrical to conical or clavate beaks. Flattened pycnidial irregular locules may be formed on the lateral flanks of the ectostromata. The surface of the ectostroma is finally blackened and there is usually a blackened dorsal zone on the bark surface at maturity. Perithecia radially elongated, 240–480 × 320–640μ, definitely clustered beneath the ectostromatic disc and surrounded by a rich development of entostromatic mycelium which may give the stromatic area a lighter colour. Asci clavate with a refractive ring in the apex, 55–65 × 6–9μ. Spores biseriate, fusoid-ellipsoid, hyaline, two-celled, often inequilateral or slightly curved, constricted at the setpum, 15–20 × 2·5–5·5μ.

Host: *Quercus*.

British collections: **K**, Herb. Cooke, 1885, Highgate, No. 24 (*V. fuscidula*). **M.H.** 831, to 842: Ashridge, Ashtead, Bettwys-y-Coed, Bristol, Byfleet, Edinburgh, King's Lynn, Mickleham, Oxford, Richmond Park, Tintern, February to October; 873 to 876 (Pycnidial): Ashtead, King's Lynn, Richmond Park, May to September.

This species is not typical of the genus *Diaporthe*, only sometimes showing very slight dorsal blackening, and having an imperfect stage which is of the *Fusicoccum* rather than the *Phomopsis* type. It is so obviously related to other species in this group, however, that it is retained here as a somewhat atypical species.

CONIDIAL CONNECTIONS:

Cytispora leucosperma Desm. *Pl. Cr. Fr.* No. 489.
C. quercina Sacc. in *Mich.* I (1878), 261.
Fusicoccum quercinum Sacc. in *Mich.* II (1881), 345.
Cytispora quercina West. in Lamb. *Fl. Myc. Belg.* III (1880), 150.
Myxosporium lanceola Sacc. & Roum. in *Rev. Myc.* VI (1884), 36.
Phomopsis quercinum (Sacc.) v. Höhn. in *Sitz. Akad. Wiss. Wien*, CXV (1906), 681.

The imperfect stage of *D. leiphaemia* has been variously described and interpreted under the above names. Conidial locules are formed on the lateral flanks of the conical ectostromata beneath which perithecial initials may be produced. These cavities may fuse to form a single flattened arched cavity or may break open to the exterior irregularly exposing the hymenial layer. Various types of conidia and conidial

measurements have been reported for the conidia of this species. They fall, in general, however, into two groups; one cylindric, more or less curved, 6–12 × 1·5–2μ, and one fusiform, 14–22 × 3–4μ.

Conidia from the pycnidial collections in the Mason Herbarium were all of the elongate-fusoid type and measured 14–21 × 2·5–3·5μ.

Single ascospore cultures on Oak twigs received from E. W. Mason showed numerous, spherical, erumpent stromata within some of which were formed irregular conidial locules. Only the one (alpha) type of conidium was seen. This type was normally elongate-fusoid, straight or slightly curved, 14–20 × 2·5–3μ, but in some spore horns was quite variable, being often shorter fusoid, 11·5–20 × 2–3·5μ and variously curved and misshapen.

Somewhat similar cylindric-fusoid conidia, 11–20 × 2–5μ, were produced in my cultures of the variety *Raveneliana* of this species, which is the variety occurring in America. Short cylindric to somewhat allantoid beta conidia, 5·5–10 × 1·5–2μ, were also formed in these cultures.

22. **Diaporthe tessella** (Pers.) Rehm.

Rehm Asc. (1873), No. 176

Sphaeria tessella Pers. *Syn. Fung.* (1801), 48.
S. glyptica Berk. & Curr. in Herb. Berk. (1839).
Valsa tessella Fr. *Sym. Veg. Sc.* (1849), 411.
Diaporthe tessalata (Pers.) Nits. in Herb. Nits. (1864).
Hapalocystis tessella Auersw. in Herb. Nits. (1864).
Cryptospora tessella (Pers.) Karst. *Myc. Fenn.* II (1873), 79.
Valsa glyptica Berk. & Curr. in *Grev.* IV (1875), 100.
V. mucronata Pk in *N.Y. St. Mus. Rep.* XXVIII (1875), 74.
Diaporthe glyptica (Berk. & Curr.) Sacc. *Syll.* I (1882), 629.
D. mucronata (Pk) Sacc. *Syll.* I (1882), 629.
Melanconis salicina Ell. & Everh. in *Proc. Acad. Nat. Sci. Phil.* (1890), 236.
Chorostate tessella (Pers.) Trav. in *Fl. Ital. Crypt.* II (1906), 205.
Allantoporthe tessella (Pers.) Petr. in *Hedw.* LXII (1921), 289.

Visible upon the surface as clusters of separately erumpent, black, papillate ostioles, which are usually grouped about a minute perforation of the periderm which exposes a blackened ectostromatic disc, 0·2–0·4 mm. in diameter. When the periderm is thin and transparent, as it often is, the blackened zone in the bark appears on the surface as a black line outlining clusters of ostioles, irregular in shape and 1–3 mm. in diameter. The entostromatic areas in the bark are either isolated or confluent forming a pustulate-effuse stroma. The perithecia are irregularly spherical, 400–725μ in diameter, and occur singly or in groups of 2–8 within pustulate stromatic areas 1–4 mm. in diameter. There is no blackening of the bark surface within these

areas but a sharp black zone extends from the margins into the bark tissue. When the entostromata are isolated, this dark zone continues along the lower bark surface between the stromata, but when the stromata are confluent, it dips only slightly into the middle or upper portion of the bark. There is no ventral zone within the wood. The perithecia are separately erumpent through the periderm, usually about a central cushion of ectostromatic tissue. Asci clavate with a refractive ring in the apex, 110–145 × 18–21μ. The spores are cylindric-fusoid, usually curved or bent at the septum, two-celled, hyaline, constricted at the septum, 35–55 × 7–9μ and often possess a faint hyaline appendage at each end.

Host: *Salix* sp.

British collections: **K**, Berkeley Herb., four packets from King's Cliffe, 1839; one from Apethorpe, 1833 (*S. glyptica*).

Petrak (*Hedw.* LXII (1921), 289) placed this species in a new genus *Allantoporthe* on account of the large allantoid spores and the lack of a *Phomopsis* stage. The spores are not allantoid, and are no larger than those of other species of *Diaporthe*. Ascospore cultures of this species have given a *Phomopsis*-like imperfect stage (*Papers Mich. Acad. Sci.* VIII (1928), 224) which had only one type of conidium, however, which were curved-fusoid to allantoid, one-celled, hyaline, 5·5–9 × 1–1·5μ.

23. **Diaporthe taleola** (Fr.) Sacc.

Fung. Ven. IV (1875), 12

Sphaeria taleola Fr. *Syst. Myc.* II (1823), 391.
Valsa taleola Fr. *Sym. Veg. Sc.* (1849), 411.
Aglaospora taleola (Fr.) Tul. *Sel. Fung. Carp.* II (1863), 168.
Hercospora Karnhuberi Keumler in Herb. von Höhnel (1887).
Diaporthe nigro-cincta Pass. in *Brun. Nuov. Fragm. Myc.* (1885–6), 27.
Caudospora taleola (Fr.) Star. in *Bih. t. K. Svenska Vet.-Akad.-Handl.* 15, III (1889), 11.
Melanconis taleola (Fr.) Speg. in *Rev. Myc.* II (1880), 32.
Chorostate taleola (Fr.) Trav. in *Fl. Ital. Crypt.* II (1906), 212.

Appearing on the surface as small conical pustules with a closely adherent periderm and a central, circular to fusoid, whitish or blackened disc, 0·2–1 mm. in diameter. Sometimes with stout, hemispherical, erumpent ostioles. Entostromata isolate, definitely outlined beneath by a sharp ventral zone entirely within the bark; no dorsal zone. The line along which the ventral zone abuts upon the periderm often appears upon the surface as a marginal ridge about the pustule. Perithecia mostly somewhat radially elongated, 240–400 × 320–400μ, arranged in a definite cluster within the isolate entostromatic area and beneath a definite, white, conical to pulvinate ectostroma. Ostioles

collectively erumpent through this ectostroma. Asci long-cylindric with a stipe-like base and a refractive ring in the apex, usually 8- but sometimes 4-spored, 130–160 × 10–13μ. Spores uniseriate, broad ellipsoid, two-celled, hyaline, constricted at the septum, with cylindrical, hyaline, apical appendages, 6–10 × 1–1·5μ, and 2–3 lateral, somewhat longer appendages radiating from the region of the septum. Spores 17–25 × 7–9·5μ.

Host: *Quercus.*

British collections: Plowr. *Sphaer. Brit.* II, 37. Cke, *Fung. Brit.* II, 231 (*V. taleola*). **M.H.** 843 to 849: Arundel, Kew, Oscott College, Richmond Park and Old Deer Park, Sheen Common, January to October.

This is quite a distinct species which has been placed in a separate genus, *Caudospora*, by Starback, on account of the peculiar appendages. It is a typical *Diaporthe*, however, and many other species of the genus have appendaged spores. The multiplication of genera on slight distinctions only causes confusion. The appendages on the spores soon disappear and are often lacking in older spores.

CONIDIAL CONNECTIONS:

Libertella taleola Sacc. *Syll.* III (1884), 745.
Myxosporium taleola Sacc. *Syll.* III (1884), 726.

The Tulasnes describe "stylospores" of *Aglaospora taleola* as linear, cylindrical, curved and 20–30 × 4μ. They also mention globular conidia, 3·5μ in diameter, which form agglutinate masses. Fuckel (*Symb. Nachtr.* I (1871), 312) found similar stylospores 24 × 4–5μ and also straight elliptic "leucoconidia" 16 × 8μ, but no spherical conidia. Tubeuf (*Diseases of Plants*, p. 226, Eng. ed.) figures similar sickle-shaped conidia and Currey (*Phil. Trans. Roy. Soc. Lond.* CXLVII (1857), 550) reports and figures straight to strongly curved spores. Fuckel gives the locules as being labyrinthiform and in the apex of the ectostroma and they are similarly figured by Tubeuf. All of the conidia are one-celled.

CRYPTODIAPORTHE Petrak emend.

Ann. Myc. XIX (1921), 118

Perithecia immersed in the bark, more or less irregularly scattered or in definite clusters but usually with convergent ostiolar necks which are erumpent through the periderm or through a variously formed ectostroma. Ectostroma scantily developed or as a definite conical to pulvinate erumpent disc, or as a loose weft of hyphae causing a broad angular rupture of the periderm. Entostroma very scanty or as a rich development of hyphae about the perithecia often forming a definitely orientated stroma. No blackened marginal zones within the substratum. Asci clavate, often with a refractive ring in the apex and

with a tapering base which is evanescent freeing the asci within the perithecium. Spores hyaline, equally two-celled, ellipsoid to fusoid, straight or curved and often appendaged. Conidial stages various.

The genus *Cryptodiaporthe* was erected by Petrak to include those species of *Diaporthe* with a weak entostromatic development and no blackened zones within the substratum. The genus is here extended to include all forms without blackened zones in the substratum and equally two-celled spores.

KEY TO THE BRITISH SPECIES OF *CRYPTODIAPORTHE*

I. Spores 4μ or less in diameter.
  A. Ostioles erumpent singly or in loose groups of 2–4 without a well-developed ectostroma.
    1. Spores 9–11μ long. 1, *C. Lebiseyi* (*Acer*)
    2. Spores 13–22μ long. 2, *C. salicella* (*Salix, Populus*)
  B. Ostioles erumpent in definite groups through a pustulate ectostroma.
    1. Spores 15–20μ long, ostioles usually flattened, band-like. 5, *C. hystrix* (*Acer*)
    2. Spores 11–16μ long, ostioles cylindric.
      a. Ostioles not strongly erumpent, spores usually appendaged. 4, *C. castanea* (*Castanea*)
      b. Ostioles stout, strongly erumpent, spores not appendaged. 8, *C. hranicensis* (*Tilia*)

II. Spores more than 4μ in diameter.
  A. Ostioles erumpent singly or in small loose groups through irregular breaks in the periderm. 3, *C. salicina* (*Salix, Populus*)
  B. Ostioles erumpent collectively through a definite disc.
    1. Ostioles erumpent through a small conical whitish ectostroma, forming a definite disc. 7, *C. Aesculi* (*Aesculus*)
    2. Ostioles loosely erumpent through a widely erumpent, brownish cortical disc. 6, *C. pyrrhocystis* (*Corylus*)

1. **Cryptodiaporthe Lebiseyi** (Desm.) Wehm.

Sphaeria Lebiseyi Desm. in *Ann. sci. nat.* sér. 2, xv (1841), 144.
S. blepharodes Berk. & Br. in *Ann. Mag. Nat. Hist.* ser. 3, vii (1861), 454.
Diaporthe Lebiseyi (Desm.) Niessl, *Beitr.* (1872), 54.
D. blepharodes (Berk. & Br.) Sacc. *Syll.* i (1882), 678.
D. hystricula Sacc. & Speg. in *Mich.* i (1879), 392.

Gnomonia Aceris Feltg. *Vorst. Pilz-Fl. Lux.* Nachtr. III (1903), 157.
Chorostate hystricula (Sacc. & Speg.) Trav. in *Fl. Ital. Crypt.* II (1906), 211.

Appearing on the surface as numerous, minute, conical or elongate pustulate ruptures of the periderm, through which the minute, fine filiform ostioles (30–40μ in diameter) are more or less erumpent, singly or in small clusters of 2–4. Perithecia spherical or somewhat flattened, 200–350μ in diameter, scattered singly or in loose clusters within the bark cortex, singly erumpent or with the ostioles convergent and collectively erumpent. There are no blackened zones within the bark or wood. Asci clavate, 30–45 × 4–8μ. Spores biseriate, narrow-fusoid, hyaline, often one-celled at first, becoming two-celled, sometimes inequilateral (?), 9–11 × 2–2·5μ.

Host: *Acer Pseudo-platanus.*

British collections: **K** (sheet 2372), Herb. Berk., 1879. Cke, *Fung. Brit.* II, 244 (*S. blepharodes*).

This is a very confused species which seems to be a European form of *C. densissima* var. *spicata*, from which it differs in the smaller spores and less elongated ostioles. If it is a distinct species, it is easily confused with the immature condition of *D. eres*, from which it differs in the smaller spores and the lack of any blackening of the substratum. It is also easily confused with *C. Niesslii*, which is also difficult to delimit.

CONIDIAL CONNECTIONS:

Phoma Lebiseyi Sacc. in *Mich.* I (1878), 257.
Phomopsis Lebiseyi (Sacc.) Died. in *Ann. Myc.* IX (1911), 25.

Saccardo gives the conidia of this species as fusoid, 8–10 × 3μ.

2. **Cryptodiaporthe salicella** (Fr.) Wehm. non Petrak.

Sphaeria salicella Fr. *Syst. Myc.* II (1823), 377.
Valsaria decipiens Auersw. in Herb. Nits. (1863).
Diaporthe spina Fuck. *Symb. Myc.* (1869), 210.
D. spina var. *apiculata* (Wint.) Rehm in *Ann. Myc.* VII (1909), 404.
Cryptodiaporthe populina Petr. in *Ann. Myc.* XIX (1921), 117.
C. apiculata (Wallr.) Petr. in *Ann. Myc.* XIX (1921), 177.

Visible on the surface as numerous, minute, papillate swellings of the periderm which are soon ruptured by the separately erumpent, fine conical to cylindric ostioles. Perithecia small, 280–400μ in diameter, spherical, with membranous walls, scattered singly or in small loose clusters of 3–4. There is no stromatic development about the perithecia, but there is sometimes a slight greyish ectostromatic cushion through which the ostioles are erumpent. There are no blackened zones in either the bark or the wood. Asci clavate, often

stipitate, with a refractive ring in the apex, 25–50 × 9–12μ. Spores biseriate or obliquely uniseriate, cylindrical-fusoid, acute at the ends, two-celled, hyaline, scarcely or not at all constricted at the septum, straight or sometimes curved, 15–22 × 2–2·5 (3) μ. (When young, the spores may be shorter fusoid, 13–18 × 2–2·5μ.)

Host: *Salix* sp.

British collections: Plowr. *Sphaer. Brit.* II, 67 (*S. salicella*); II, 44 (*D. spina*). Non Cke, *Fung. Brit.* II, 243 and 246 (*S. salicella*).

This species might easily be considered as a *Gnomonia*, but often shows clustered perithecia and sometimes produces small ectostromata through which the ostioles are erumpent. It is very similar to *C. salicina* in outward appearance but has more scattered perithecia, thinner ostioles and narrower fusoid spores. Contrary to most of the exsiccata issued, *Sphaeria salicella* Fr. appears to be this species (see discussion under *C. salicina*).

CONIDIAL CONNECTIONS:

Cryptosporium coronatum Fuck. *Symb. Myc.* (1869), 193.
Discella coronata (Fuck.) Petr. in *Ann. Myc.* XIX (1921), 180.

Petrak gives the above as the imperfect stage of *C. populina*. The conidia are described as cylindric to spindle-form, straight or slightly curved, with an indefinite cross wall, and 15–24 × 2·5–5μ. These conidia are strikingly similar to those I obtained in cultures of *C. salicina*

3. **Cryptodiaporthe salicina** (Curr.) Wehm.

(?) *Sphaeria apiculata* Wallr. *F. Crypt. Germ.* II (1833), 778.
(?) *S. convexa* Preuss *Fung. Hoyersw.* (1852), 300.
Halonia salicella Rab. *Fung. Eur.* (1850), No. 1445.
Sphaeria salicina Curr. in *Trans. Linn. Soc. Lond.* XXII (1859), 157.
Diaporthe Salicis Nits. in Fuck. *Fung. Rhen.* (1867), 1987.
Sphaeria apiculata Fuck. *Symb. Myc.* (1869), 115.
Cryptospora populina Fuck. *Symb. Myc.* (1869), 193.
C. salicella Fuck. *Symb. Myc.* (1869), 193.
Diaporthe salicella Sacc. *Myc. Ven. Spec.* (1873), 135.
Sphaeria sphingiophora Oud. in *M. M. Neer.* II (1873), 64.
Cryptosporella populina (Fuck.) Sacc. in *Mich.* I (1879), 506.
Diaporthe convexa (Preuss) Sacc. *Syll.* I (1882), 630.
D. sphingiophora (Oud.) Sacc. *Syll.* I (1882), 622.
Metasphaeria apiculata (Fuck.) Sacc. *Syll.* II (1883), 166.
Diaporthe pulchella Sacc. & Briard in *Att. d. R. Inst. Ven. di Sci.* ser. 4, II (1884), 3.
D. santonensis Sacc. *Fung. Gall.* ser. 5 (1884), No. 2163.
Valsa punctata Cke in *Grev.* XIV (1885), 47.

Diaporthe punctata (Cke) Berl. & Vogl. *Syll. Add.* (1886), 108.
Gnomonia apiculata (Fuck.) Wint. in Rab. *Krypt. Fl.* I, II (1886), 589.
Diaporthe populea Sacc. in *Bull. Soc. Roy. Belg.* XXVI (1887), 174.
Gnomonia salicella Schröt. *Pilze Schles.* 3, II (1897), 392.
Diaporthe cupulata Berl. & Destr. *Suppl. Cat. Champ. Haye* (1897), 7.
D. salicella var. *Populi-tremulae* Feltg. *Vorst. Pilz-Fl. Lux.* Nachtr. IV (1905), 87.
Chorostate salicella Trav. in *Fl. Ital. Crypt.* II (1906), 203.
C. populea (Sacc.) Trav. in *Fl. Ital. Crypt.* II (1906), 204.
Diaporthe recedens Sacc. in *Ann. Myc.* XII (1914), 290.
D. populina (Fuck.) v. Höhn. in *Ann. Myc.* XVI (1918), 106.
Cryptodiaporthe salicella Petr. in *Ann. Myc.* XIX (1921), 182.

Visible on the surface as numerous, minute, conical pustules consisting of one or more ostioles surrounded by the closely adherent and pustulate periderm. The ostioles are usually separately erumpent but are often in clusters of 2–8, which sometimes become fused to form a small disc. Perithecia spherical or somewhat flattened, 300–480 × 380–400μ, walls membranous, 18–27μ in thickness, composed of 4–5 layers of dark-walled pseudoparenchyma cells. The perithecia are scattered singly or in small loose groups within the bark cortex. There is often a slight pulvinate ectostroma formed on the bark surface, but this ectostroma is usually obliterated by the ostioles which are erumpent through it. There are no blackened zones within the substratum. Asci clavate, 45–70 × 9–15μ. Spores biseriate, ellipsoid to inequilateral, blunt at the ends. Two-celled but often tardily septate, hyaline, not constricted at the septum, 15–20 × (3·5) 4·5–7·5μ.

Hosts: *Salix* and *Populus* spp.

British collections: Cke, *Fung. Brit.* II, 246. Vize, *Micr.-Fung. Brit.* 180 (*S. salicella*). **K**, Herb. Cooke, No. 210 (four packets) (*V. punctata*). **M.H.** 920, Tintern, April, 1924 (*Didymella Salicis*); 1215, Glamorganshire, April, 1932 (*D. salicella*).

This species has also been placed under *Gnomonia*, but the grouping of the perithecia and the formation of ectostromatic discs would exclude it from this genus. The synonyms and exsiccata of this and the preceding species are greatly confused. This species has generally been considered as the *Sphaeria salicella* of Fries, but an examination of Fries's material (*Scler. Suec.* 188), as represented in the Farlow Herbarium, shows the spores of the preceding species and the name *salicella* is, therefore, retained for that species. Desmazières (*Pl. Cr. Fr.* (1836), 838) states that in some issues of Fries's *Scler. Suec.* 188 there are two distinct species, and it is possible that his exsiccatum is a mixture of these two species. The first name that can be definitely fixed to the above species is that of *Sphaeria salicina* Curr.

CONIDIAL CONNECTIONS:

Phacidium carbonaceum Fr. *Syst. Myc.* II (1823), 574.
Discella carbonacea (Fr.) Berk. & Br. in *Ann. Mag. Nat. Hist.* ser. 2, V (1850), 377.

The above species is supposed by Petrak (*Ann. Myc.* XIX (1921), 192) to belong to his *Cryptodiaporthe salicella* merely by association. My cultures of this species have produced minute ectostromatic pycnidia with enclosed spherical locules containing long, cylindric to fusoid conidia, straight or somewhat curved, 15–22 × 1·8–2·5μ. These conidia were usually one-celled, but sometimes became septate when fully mature.

4. **Cryptodiaporthe castanea** (Tul.) Wehm.

Sphaeria castanea Tul. in *Ann. sci. nat.* sér. 3, XV (1851), 379.
Valsa castanea Tul. in *Ann. sci. nat.* sér. 4, V (1856), 117.
Cryptospora liphaemoides Fuck. *Symb. Myc.* Nachtr. II (1873), 34.
Diaporthe castanea (Tul.) Sacc. *Syll.* I (1882), 624.
D. liphaemoides (Fuck.) Trav. in *Fl. Ital. Crypt.* II (1906), 207.
Chorostate castanea (Tul.) Trav. in *Fl. Ital. Crypt.* II (1906), 207.

Appearing on the surface as angular ruptures of the periderm exposing brownish ectostromatic or cortical discs of variable size and form, from 0·2–2 mm. in diameter. Conical to broad pulvinate ectostromata are usually formed on the bark surface, often causing wide ruptures of the periderm but soon becoming blackened or falling away. There are no blackened zones within the substratum. Irregularly shaped conidial locules may be formed, usually within the lateral portions of the ectostroma. Perithecia spherical to flattened, 240–800 × 200–500μ, clustered in small or larger groups within the upper bark and often surrounded by a rich development of entostromatic hyphae, forming a light coloured area. Ostioles barely erumpent through the ectostroma or bark surface. Asci 50–60 × 7–8μ clavate. Spores biseriate, cylindrical to cylindric fusoid, two-celled, hyaline, often tapering toward one end, usually somewhat curved, very slightly or not constricted, 11–16 × 2–3μ, and usually having a short, cylindric, hyaline appendage at each end.

Host: *Castanea* sp.

British collections: **M.H.** 446, Arundel, October, 1928.

Similar to *C. Hystrix* in the rather widely erumpent stroma but differing in the small spores and lack of flattening of the ostioles.

CONIDIAL CONNECTIONS:

Cytispora castanea Sacc. in *Mich.* I (1879), 519.
Fusicoccum castaneum Sacc. *Syll.* III (1884), 249.
Malacostroma castaneum (Sacc.) v. Höhn. in *Ber. Deut. Bot. Ges.* XXXV (1917), 355.

The Tulasnes (*Sel. Fung. Carp.* II (1863), 202) describe the conidia of this species as sublanceolate, 6·5 × 2μ, and figure irregularly shaped locules, usually in the lateral portions of an ectostroma. Saccardo gives the conida as 6·5–8, sometimes 10–12 × 2–2·5μ. Fuckel says the conidia of his *Cryptospora liphaemoides* are 6–10 × 2–4μ, but his *Fung. Rhen.* 2453 shows small elliptical conidia 4–6 × 1·5–2μ.

5. **Cryptodiaporthe hystrix** (Tode) Petr.

Ann. Myc. XIX (1921), 119

Sphaeria hystrix Tode (?) *Fung. Meckl. Sel.* II (1791), 53.
Diatrype hystrix Fr. (?) *Sym. Veg. Sc.* (1849), 383.
Mamiana hystrix (Tode) de Not. *Sfer. Ital.* I (1863), 43.
Valsa longirostris Tul. *Sel. Fung. Carp.* II (1863), 200.
Cryptospora hystrix (Tode) Fuck. *Symb. Myc.* (1869), 194.
Diaporthe hystrix (Tode) Sacc. *Fung. Ven.* IV (1873), 6.
D. longirostris (Tul.) Sacc. *Syll.* I (1882), 609.
D. mamiana Sacc. *Syll.* I (1882), 609.
Chorostate hystrix (Tode) Trav. in *Fl. Ital. Crypt.* II (1906), 212.
C. mamiana (Sacc.) Trav. in *Fl. Ital. Crypt.* II (1906), 201.

Producing small, characteristically widely erumpent pustules on the surface. There is a sparse production of stromatic hyphae in and upon the surface layers of bark which causes the periderm to be ruptured and thrown back, exposing the cortical disc which is light coloured when fresh. These open pustules may be small and scattered or larger, longitudinally elongated, 1–4 mm. in length, or confluent in longitudinal series for long distances. The perithecia are spherical or flattened, 480–640 × 240–480μ, arranged in dense clusters or irregularly scattered in the upper layers of the bark and are separately erumpent through the cortical disc as loose clusters of more or less elongated sinuous ostioles, which, at maturity, are characteristically flattened or band-like. There are no blackened zones in either bark or wood. The asci are clavate and 40–54 × 7–11μ. The spores are biseriate or irregularly triseriate, long fusiform, somewhat curved or inequilateral, two-celled, hyaline, slightly constricted at the septum, 15–20 (23) × 2–3 (3·5)μ. (Appendaged according to some descriptions but appendages seldom seen.)

Host: *Acer Pseudo-platanus.*

British collections: **M.H.** 153, Mickleham, July, 1923; 183, Copford near Colchester, June, 1924; 189*b*, Cambridge, May, 1925.

CONIDIAL CONNECTIONS:

Myxosporium Tulasnei Sacc. *Syll.* III (1884), 723.
M. spathianum Allesch. in *Hedw.* XXXVI (1897), 163.
Septomyxa Negundinis Allesch. in *Ber. Bay. Bot. Ges.* V (1897), 22.

S. Tulasnei (Sacc.) v. Höhn. in *Ann. Myc.* I (1903), 527.
Phomopsis Tulasnei (Sacc.) v. Höhn. in *Sitz. Akad. Wiss. Wien*, CXV (1906), 681.

The Tulasnes give the "stylospores" of this *Valsa longirostris* as 13–16 × 5·3μ and one-septate at maturity. Allescher's *M. spathianum* has one-celled conidia 8–11 × 2–3·5μ and his *S. Negundinis* two-celled conidia 12–20 × 2·5–4μ. Saccardo describes the conidia of *M. Tulasnei* as 18–25 × 2·5–3μ. This synonymy is taken from von Höhnel. The imperfect stage seems to be confused in the literature and is based on observation alone. Collection No. 189*b* in the Mason Herbarium shows immature conditions with conidial locules with perithecial initials beneath. Numerous locules which are soon confluent are formed within an ectostroma just beneath the periderm. Upon the rupture of the periderm the fused locules break open to the exterior and expose the hymenial layers. The conidia are long fusoid, one-celled, hyaline, 9–14 (16·5) × 2–2·5μ. Sometimes a faint or apparent septum is present, but it is doubtful whether this is more than a separation of the protoplast.

6. **Cryptodiaporthe pyrrhocystis** (Berk. & Br.) Wehm.

Sphaeria tessera Fr. (?) *Syst. Myc.* II (1823), 481.
Diatrype pyrrhocystis Berk. & Br. in *Ann. Mag. Nat. Hist.* ser. 3, III (1859), 364.
Diaporthe pyrrhocystis (Berk. & Br.) Fuck. *Symb. Myc.* (1869), 204.

Visible on the surface as irregularly elongate, perforate ruptures of the periderm which expose a disc the colour of the bark cortex and containing a number of separately erumpent papillate ostioles. There are no blackened zones in either the bark or wood. Perithecia spherical or irregular from crowding, 250–400μ in diameter, with light brown walls 20μ thick. The perithecia are always in groups and have more or less of a development of entostromatic mycelium about them and usually a small ectostromatic cap above them. The ostioles are usually separately erumpent through this broad, flat, cortical disc, which causes an irregular rupture of the periderm. Asci 85–105 × 16–18μ. Spores biseriate, ellipsoid, rounded at the ends, two-celled, hyaline, constricted at the septum, 21–27 (30) × 6–9μ, with a short, stout, hyaline appendage at each end.

Host: *Corylus Avellana.*

British collections: Rab. *Fung. Eur.* 136. Plowr. *Sphaer. Brit.* I, 35.

This species approaches *D. decedens* but has larger spores and a more widely erumpent cortical disc.

CONIDIAL CONNECTIONS:

Small allantoid, one-celled, hyaline conidia measuring 9–12 × 1·5μ were seen on Plowr. *Sphaer. Brit.* I, 35 and similar conidia measuring 13–15μ in length were seen on Krieg. *Fung. Sax.* 84.

7. **Cryptodiaporthe Aesculi** (Fuck.) Petr.

Ann. Myc. XIX (1921), 119

Cryptospora Aesculi Fuck. *Symb. Myc.* (1869), 193.
Cryptosporella Aesculi (Fuck.) Sacc. *Mich.* I (1877), 30.
Valsa Hippocastani Cke in *Grev.* XIII (1884), 98.
V. aesculicola Cke in *Grev.* XIV (1885), 47.
Diaporthe Hippocastani (Cke) Berl. & Vogl. *Syll. Add.* (1886), 105.
D. aesculicola (Cke) Berl. & Vogl. *Syll. Add.* (1886), 105.
D. Aesculi (Fuck.) v. Höhn. in *Ann. Myc.* XVI (1918), 116.

Appearing on the surface as circular perforations or pustulate ruptures of the periderm, 0·2–0·5 mm. in diameter, exposing a minute, white flocculent, ectostromatic disc, through which a small cluster of cylindrical, sometimes slightly elongated, ostioles are erumpent. There are no blackened zones within the substratum. A small white ectostromatic cushion, within which irregular pycnidial chambers are formed, is produced within the periderm. The perithecia are spherical or somewhat flattened, have a thick heavily blackened wall, are 240–480 × 240–400μ and are formed in small groups within the upper bark layers or within the periderm itself. They are formed beneath the ectostroma through which they are collectively erumpent. Asci clavate with a refractive ring in the apex, 80–90 × 8–9·5μ. Spores biseriate, one-celled, ellipsoid, when immature, becoming two-celled and fusoid when mature, hyaline, constricted at the septum, 14–23 × 4·5–7μ. When young the spores may show very slight gelatinous appendages at each end.

Host: *Aesculus Hippocastanum.*

British collections: Vize, *Micr.-Fung. Brit.* 597.

This species represents a group with small conical light coloured ectostromata and closely adherent periderm.

CONIDIAL CONNECTIONS:

Myxosporium (?) *aberrans* Sacc. in *Mich.* I (1878), 128.
Septomyxa Aesculi Sacc. *Syll.* III (1884), 766.
Fusicoccum Aesculi Corda in Sturm *Deutsch. Crypt. Fl.* III, Ab. 2 (1829), 111, pl. 52.
Cryptosporium Hippocastani Cke in *Grev.* XIII (1884), 4.
Fusicoccum Hippocastani (Cke) v. Höhn. in *Bot. Inst. Techn. Hochsch. Wien*, VI, I (1929), 20.
Septomyxa Aesculi (Corda) Petr. in *Ann. Myc.* XIX (1921), 92.

The imperfect stage of Fuckel's *Cryptospora Aesculi* was described by Saccardo as *Septomyxa Aesculi*. The conidia were given as fusoid-ellipsoid, sometimes slightly curved, two-celled, 15–16 × 3–4μ. Both Petrak and von Höhnel have argued theoretically as to the imperfect stage. The above synonymy is taken from Petrak who gives the conidia as 14–32 × 3–5μ. Many exsiccata show an accompanying conidial stage, apparently *Septomyxa Aesculi*, in which the conidia are elongate-fusoid, slightly curved, one-celled or with a faint septum, 14–23 × 2·5–4μ. The conidia seem to be quite variable in size and septation. Grove (*Kew Bull.* (1919), 183) gives *Phoma diplodioides* Sacc. and *Diplodina truncata* Sacc. as synonyms of the above.

8. **Cryptodiaporthe hranicensis** (Petr.) Wehm.

Diaporthe hranicensis Petr. in *Ann. Myc.* XII (1914), 477.

Appearing upon the surface as broad, angular, pustulate ruptures of the periderm, 1–3 mm. in diameter, through which there is erumpent a dense cluster of stout (100–200μ in diameter), elongate, cylindrical ostioles with tapered conical tips and clothed with a greyish pulverulence. There may be a slight blackening of the bark surface about the ostioles but there are no blackened zones within the substratum. Perithecia 480 × 320–480μ, clustered in groups of 12–20 within the upper bark cortex, which is often filled with a sandy furfuraceous deposit of crystalline matter. Asci clavate, stipitate, with a thickened apical wall and a refractive ring in the apex, 60–80 × 8–9μ (sp. p. 50–60μ). Spores biseriate above, uniseriate below, oblong ellipsoid to ellipsoid, sometimes slightly inequilateral or curved, finally faintly one-septate, hyaline, not constricted at the septum, 11–15 × 2·5–4μ.

Host: *Tilia*.

British collections: **M.H.** 955, Oscott College, April, 1930; 957, Richmond Park, April, 1928.

This species appears to be somewhat intermediate between *Cryptodiaporthe* and *Cryptosporella*. The spores are quite variable in shape and often one-celled. Conidial chambers were seen on the flanks of the ectostromata of No. 955. These chambers were covered by the periderm only and contained numerous bacillar, one-celled, hyaline conidia, 3·5–6·5 (8) × 1–1·5μ.

APIOPORTHE v. Höhn. emend.

Sitz. Akad. Wiss. Wien, CXXVI (1917), 381

Perithecia immersed in the substratum, usually clustered. Entostromatic development scanty or variously developed as a mycelial weft or definite tissue about the perithecia. Ectostroma also various. Tissues above the perithecia sometimes blackened but no definite

marginal zones within the substratum as in *Diaporthe*. Asci clavate with refractive ring in the apex, stalks evanescent. Spores hyaline, unequally two-celled, fusoid to pyriform, commonly tapered toward one end which contains the smaller cell. Conidial stages consisting of variously shaped cavities formed within a stromatic pycnidial tissue by the simultaneous breaking up into conidia of the hyphae in these locular areas, without the formation of a definite hymenium.

Petrak (*Ann. Myc.* XXVII (1929), 401) has segregated a genus *Apioporthella* on the basis of *A. vepris* to include those forms of *Apioporthe* with a poorly developed stroma. It is true that the type species *A. anomala* (Pk) v. Höhn. has a very strongly developed entostroma, but inasmuch as there are all gradations of stromatic development within the genus as here outlined, it hardly seems worth while to attempt a separation on this basis.

1. **Apioporthe vepris** (De Lacr.) Wehm.

Sphaeria vepris De Lacr. in Rab. *Fung. Eur.* (1859), 443.
Calosphaeria idaeicola Karst. *Fung. Fenn.* (1866), 856.
Diaporthe vepris (De Lacr.) Fuck. in Nits. *Pyr. Germ.* (1870), 300.
Gnomonia idaeicola Karst. *Myc. Fenn.* II (1873), 126.
Diaporthe nidulans Niessl, *Notiz. Pyr.* (1876), 49.
D. nidulans forma *exigua* Niessl, *Notiz. Pyr.* (1876), 50.
Valsa obscura Pk in *N.Y. St. Mus. Rep.* XXVIII (1876), 73.
Gnomoniella idaeicola (Karst.) Sacc. *Syll.* I (1882), 418.
Diaporthe obscura (Pk) Sacc. *Syll.* I (1882), 627.
D. idaeicola (Karst.) Vestergr. *Bot. Notis.* (1899), 156.
Chorostate nidulans (Niessl) Trav. in *Fl. Ital. Crypt.* II (1906), 210.
Gnomonia vepris (De Lacr.) Kiessl. in *Beih. Bot. Centr.* XXIX (1915), 401.
Apioporthe obscura (Pk) Wehm. in *Papers Mich. Acad. Sci.* VIII (1928), 219.

Usually forming longitudinally elongate pustulate ruptures of the periderm with small central blackened discs containing the scarcely erumpent ostioles. Sometimes erumpent merely as circular blackened discs, 0·1–0·2 mm. in diameter, composed of one or a few ostioles. No blackened zones within the substratum. Perithecia 160–300 × 150–200μ, usually in definite clusters, but occasionally in small thickly scattered groups. Stromatic development variable. Disc sometimes composed only of a few fused ostioles, again composed of a definite ectostromatic cushion of brownish parenchyma through which the ostioles are erumpent. Sometimes the perithecia may also be more or less imbedded within this stromatic matrix. Asci clavate, 30–40 × 6–8μ. Spores obliquely biseriate, ellipsoid, narrowed towards one end, often somewhat curved, unequally two-celled, often constricted

at the septum, 6–9 (10) × 2–2·5μ and often with a short, bristle-like, hyaline appendage at each end.

Host: *Rubus*.

British collections: Plowr. *Sphaer. Brit.* III, 63 (*D. rostellata*). Non Plowr. *Sphaer. Brit.* II, 71 (*S. vepris*).

This is the only species of the genus *Apioporthe* of which I have records from Great Britain. It is common on *Rubus* throughout Europe and America.

CONIDIAL CONNECTIONS:

Phoma vepris Sacc. *Syll.* III (1884), 76.

Phomopsis vepris (Sacc.) v. Höhn. in *Sitz. Akad. Wiss. Wien*, CXV (1906), 681.

Nitschke reports the conidia of this species as fusiform to subcylindric, 6 × 1·5μ. In my cultures (*Amer. Journ. Bot.* VIII (1921), 244) of this species there were produced similar conidia which were one-celled, hyaline, ellipsoid to fusoid-cylindric, 4–7 × 1–2μ. They were cut off irregularly from loose hyphae in the central portion of a stromatic pycnidium.

DIAPORTHOPSIS Fabre.

Ann. sci. nat. sér. 6, XV (1883), 35

Perithecia immersed, scattered singly or crowded within an evenly effuse entostromatic area, separately erumpent. Surface of substratum usually more or less blackened. Entostromatic areas often margined by a blackened zone as in *Diaporthe*. Asci clavate, with evanescent stalks which free the asci within the perithecium. Spores hyaline, one-celled, ellipsoid to fusoid, straight or curved, sometimes appendaged.

KEY TO BRITISH SPECIES OF *DIAPORTHOPSIS*

I. Forming small elongated blackened patches (0·5–3 mm.) on surface, ventral zone definite. 2, *D. pantherina* (*Pteris*)

II. Surface blackening, if present, not in small isolated areas, ventral zone faint or absent. 1, *D. Angelicae* (*Umbelliferae*)

1. **Diaporthopsis Angelicae** (Berk.) Wehm.

Sphaeria Angelicae Berk. in *Mag. Bot. and Zool.* (1837), 48.

S. Berkeleyi Desm. in litt. ad Mont. in *Ann. sci. nat.* sér. 2, VIII (1837), 358.

Diaporthe Berkeleyi (Desm.) Nits. *Pyr. Germ.* (1870), 273.

Sphaeria Angelicae Fuck. *Symb. Myc.* (1869), 113.

Leptosphaeria nigrella Auersw. *Myc. Eur. Pyr.* (1869), Pl. 12, f. 163.
Diaporthe nigrella (Auersw.) Niessl, *Beitr.* (1872), 51.
D. foeniculacea Niessl in litt. ad de Thüm. *Contr. Myc. Lusit.* II (1880), 30.
D. tetraspora Sacc. in *Mich.* II (1881), 250.
Gnomoniella Angelicae (Fuck.) Sacc. *Syll.* I (1882), 417.
Diaporthe denigrata Wint. in Sacc. *Syll.* I (1882), 649.
Diaporthopsis nigrella (Auersw.) Fabre in *Ann. sci. nat.* sér. 6, XV (1883), 35.
Gnomonia Angelicae (Fuck.) Wint. in Rab. *Krypt. Fl.* I (2) (1887), 577.

Nearly invisible at first, no blackening of the substratum when young and immature; ostioles barely visible as minute black dots. Surface of substratum later becoming more or less blackened over wide areas, which, when exposed by defoliation of the periderm, often show a violet tinge. Ventral zones absent or rather faintly developed within the pith. Ostioles small, barely erumpent as small papillate or cylindrical or conical projections, or rarely somewhat elongated. Perithecia small, spherical or flattened, 240–400 × 160–240μ, scattered singly or sometimes crowded, usually rather deeply immersed within the pith and with long slender necks. The perithecia when young are filled with numerous, broad, paraphysis-like hyphae. Asci clavate at first, becoming long-cylindric, 40–50 (85) × 4–7μ. Spores biseriate to obliquely uniseriate, ellipsoid-fusoid, one-celled, hyaline, non-constricted, 9–15 × 3–4 (4·5) μ.

Hosts: Various Umbelliferae.

British collections: Berk. *Brit. Fung.* 88 (*S. Angelicae*).

The above species is very similar to *D. Arctii* on the same hosts, and is difficult to separate, especially when *D. Arctii* is in an immature condition with one-celled spores. The surface of the substratum in *D. Angelicae*, however, is usually not so heavily blackened and incrusted and often has a violet tinge. The perithecia are also smaller on the average and are deep-seated in the pith. The spores are also broader, never constricted and have three guttulae instead of four, with one guttula in the centre of the spore. The spores also remain one-celled.

CONIDIAL CONNECTIONS:

Sphaeria complanata Tode, *Fung. Meckl. Sel.* II (1791), 21.
Phoma complanata (Tode) Desm. in *Ann. sci. nat.* sér. 3, XVI (1851), 299.

Given by Fuckel as the conidial stage of his *Sphaeria Angelicae*. Conidia oblong, curved, 5–6 × 2–2·5μ.

Phoma eryngiicola Brun. in *Bull. Soc. Bot. France*, XXXVI (1889), 337.
Phomopsis eryngiicola (Brun.) Trav. in *Fl. Ital. Crypt.* II (1906), 251.

Given by Traverso as the imperfect stage of *Diaporthe nigrella*. Conidia cylindrical-oblong, 10 × 3μ.

Phoma asteriscus Berk. & Br. in *Ann. Mag. Nat. Hist.* ser. 2, v (1850), 368.

Phomopsis asteriscus (Berk. & Br.) Grove in *Kew Bull.* (1917), 53.

Conidial connections given by Grove. Alpha conidia ellipsoid, 7–8 × 2–2·5μ. Sporophores cylindrical, arcuate, 12–20 × 1·25μ.

2. **Diaporthopsis pantherina** (Berk.) Wehm.

Sphaeria pantherina Berk. in *Mag. Zool. and Bot.* I (1837), 47.

Diaporthe pantherina (Berk.) Cke in *Grev.* VII (1879), 82.

On surface as fusoid to elongate-oblong dark coloured areas which are faintly or definitely outlined and 0·5–3 × 0·2–0·5 mm. Ventral zones definite within the stem. Perithecia 240–400μ in diameter, scattered singly and separately erumpent. Ostioles barely erumpent. Asci 64 × 13μ. Spores ellipsoid-fusoid, one-celled, hyaline, 2–3 guttulate, 11–12 × 3·5–4·5 (5) μ.

Host: *Pteris aquilina*.

British collections: Berk. *Brit. Fung.* 34; Plowr. *Sphaer. Brit.* III, 59.

Cooke (*Handb.* No. 2689) gives the spores of this species as having two or more obscure septa. Berkeley's *Brit. Fung.* 34 (in Farlow Herb.) showed no spores but Plowright's exsiccatum showed one-celled spores with 2–3 guttulae. Cooke probably mistook the guttulae for cells.

In addition to the above species, the following which have been described under the genus name *Diaporthe*, but which should be excluded, have been reported from Great Britain.

Diaporthe acus (Blox.) Cke in *Grev.* VII (1879), 81.

Sphaeria acus Blox. in Curr. *Trans. Linn. Soc. Lond.* XXII (1859), 325.

This species is a *Gnomonia* resembling *D. Arctii* but without any blackening of the substratum and with spores 9·5–12 × 2·5–4μ.

Host: *Rumex* sp.

British collections: **K**, Herb. Currey (Bloxam) and from Havin Bridge; Herb. Cooke, Kew, March, 1883; Herb. Berkeley, on *Rumex*; non Herb. Cooke, Neathead, Norfolk, September, 1864 (all under *S. acus*).

Diaporthe bitorulosa (Berk. & Br.) Sacc. *Syll.* I (1882), 608.

Sphaeria xanthostroma Mont. in *Ann. sci. nat.* sér. 2, I (1834), 301.

Valsa bitorulosa Berk. & Br. in *Ann. Mag. Nat. Hist.* ser. 3, III (1859), 367.

Diaporthe mucosa Wint. in Sacc. *Syll.* I (1882), 609.

Melanconis xanthostroma (Mont.) Schroet. *Krypt. Fl. Schles.* (1908), 441.

This species is a typical *Melanconis* (*M. xanthostroma*). The synonymy and exsiccata of the species are greatly confused and only a few of the synonyms are given here. It grades off into a second species, *M. hyperopta* (Nits.) Wehm., which has narrower, more acute spores which do not have the thick gelatinous walls characteristic of *M. xanthostroma*.

Host: *Carpinus Betulus*.

British collections: Berk. *Brit. Fung.* 296.

Diaporthe Bloxami (Cke) Berl. & Vogl. *Syll. Add.* (1886), 105.

Valsa Bloxami Cke in *Grev.* XIV (1885), 47.

The type of this species is apparently *Melanconis stilbostoma* on *Betula*. Cooke gives no host on the type sheet, and gives *Fagus* as doubtful in his description.

Host: *Betula* (?).

British collections: **K**, Herb. Cooke, 141, from Bloxam; 312, *Sphaeria* on Birch.

Diaporthe elaeostroma (Cke) Berl. & Vogl.

See *D. sulphurea*.

Diaporthe Epilobii Fuck.

See *D. tosta*.

Diaporthe farcta (Berk. & Br.) Niessl, *Not. neu. u. kr. Pyren.* (1876), 51.

Sphaeria farcta Berk. & Br. in *Ann. Mag. Nat. Hist.* ser. 2, IX (1852), 324.

This species, as represented in Plowr. *Sphaer. Brit.* II, 68, is mostly an effuse *Anthostroma*. Type material has not been seen.

Host: *Ulmus*.

Diaporthe Innesii (Curr.) Fuck. *Symb. Myc.* (1869), 204.

Valsa Innesii Curr. in *Trans. Linn. Soc. Lond.* XXII (1859), 281.

This is *Pseudovalsa platanoides* (Pers.) Wint. Von Höhnel (*Ber. Deut. Bot. Ges.* XXXV (1917), 252), has called it a four-celled *Diaporthe* (*D. platanoides*) (Pers.) v. Höhn.

Host: *Acer Pseudo-platanus*.

British collections: **M.H.** 180, North Hill, Minehead, March, 1927; 181, Aviemore, September, 1927; 182, Mickleham Woods, April, 1927; 184, Mickleham, July, 1927; 186, Llanbedr, Wales, October, 1924 (as *Calospora platanoides*).

Diaporthe lirella (Moug. & Nest.) Nits. in Fuck. *Symb. Myc.* (1869), 206.

Sphaeria lirella Moug. & Nest. in Fries *Elench. Fung.* II (1828), 105.

Gnomonia lirella (Moug. & Nest.) Auersw. *Syn. Pyr.* (1869), 22.

This species is not a good *Diaporthe* but rather one of the Clypeo-

sphaeriaceae (*Hypospila?*). The perithecia are more or less fused together in a stromatic mass beneath a small longitudinal Clypeus-like blackening of the surface.

Host: *Spiraea ulmaria.*

British collections: Vize, *Micr.-Fung. Brit.* 593. Berk. *Brit. Fung.* 37. Cke, *Fung. Brit.* 239. non Plowr. *Sphaer. Brit.* II, 73.

Diaporthe platanoides (Pers.) v. Höhn.

See *D. Innesii.*

Diaporthe rostellata (Fr.) Nits. *Pyr. Germ.* (1870), 298.

Sphaeria rostellata Fr. *Syst. Myc.* II (1823), 476.
S. Rubi Mart. *Flor. Erlang.* (1817), 487.
S. clavus Schm. sec. Fries.
Diaporthe Rubiae H. Fab. *Sphér. Vaucl.* (1880), 46.
D. gallophila Ell. in *Bull. Torr. Bot. Cl.* VIII (1881), 90.
D. Rubi (Mart.) Rehm f. *appendiculata* in v. Höhn. Herb. A4051 (7014).

This species is a *Gnomonia.* The perithecia are often crowded in the upper bark, but they are separately erumpent and there is no stromatic development nor blackening of the tissues in the substratum.

Host: *Rubus* spp.

British collections: Plowr. *Sphaer. Brit.* III, 63. **M.H.** 908, Llanbedr, Wales, October, 1926; 909, Ham Common, April, 1925.

Diaporthe sulphurea Fuck. *Symb. Myc.* (1869), 205.

Valsa flavo-virens Otth in Herb. Nits.
Diaporthe flavo-virens Otth *Bern. Mittheil.* VI (1868), 47.
D. affinis Sacc. in *Mich.* I (1877), 28.
Valsa olivaestroma Cke in *Grev.* XIV (1885), 48.
Diaporthe elaeostroma (Cke) Berl. & Vogl. *Syll. Add.* (1886), 107.
Chorostate sulphurea (Fuck.) Trav. in *Fl. Ital. Crypt.* II (1906), 209.
C. affinis (Sacc.) Trav. in *Fl. Ital. Crypt.* II (1906), 209.
Melanconis sulphurea (Fuck.) Petr. in *Ann. Myc.* XXI (1923), 321.
Discodiaporthe sulphurea (Fuck.) Petr. in *Hedw.* LXII (1921), 291.

This is a *Melanconis* as given by Petrak. It is a continuation of the range of variation of *M. hyperopta* and *M. xanthostroma*, having spores (17·5–27 × 6–9·5μ) larger than either of these species. The spores have the thick walls of *M. xanthostroma* but the acute tips of *M. hyperopta.*

Host: *Corylus Avellana.*

British collections: **K**, No. 2009 (Herb. Cooke 209), Jerdon, 1885. **M.H.** 392, Arundel, April, 1930.

Diaporthe tosta (Berk. & Br.) Niessl in *Hedw.* XIV (1875), 131.

Sphaeria tosta Berk. & Br. in *Ann. Mag. Nat. Hist.* ser. 2, IX (1852), 381.
Sphaerella Fuckelii Pass. *Erb. Critt. Ital.* II (1871), 645.

Diaporthe Epilobii Fuck. *Symb. Myc.* (1869), 206.
Didymosphaeria Fuckeliana (Pass.) Sacc. in *Mich.* I (1878), 440.
Didymella Fuckeliana (Pass.) Sacc. *Syll.* I (1882), 556.
D. tosta (Berk. & Br.) Sacc. *Syll.* I (1882), 556.

This species is a typical *Didymella*. The blackening of the surface of the substratum in some cases is the only reason for placing it in the genus *Diaporthe*.

Host: *Epilobium hirsutum*.

British collections: **K**, Herb. Berk. 1879; Rudloe, February, 1843 (*S. tosta*). Plowr. *Sphaer. Brit.* II, 82 (*S. tritorulosa*); III, 42 (?) (*D. Epilobii*).

The following species have been described from England, but have not been seen by me.

Diaporthe biconica (Curr.) Sacc. *Syll.* XI (1895), 310.
Valsa biconica Curr. in *Trans. Linn. Soc. Lond.* XXII (1858), 279.

From the description, this species seems to be a *Melanconis*. No host is given.

Diaporthe pulchra (Curr.) Sacc. *Syll.* I (1882), 617.
Valsa pulchra Curr. in *Trans. Linn. Soc. Lond.* XXII (1858), 279.

No conclusions can be drawn from the short description of this species. No host is given.