NOTES ON WISCONSIN PARASITIC FUNGI. XXX

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Unless indicated otherwise the collections mentioned in this series of notes were made in 1963, in which case the year date is in most instances omitted. Certain records are based on infections noted on phanerogamic specimens in the University of Wisconsin Herbarium. Where it has not been feasible to obtain a separate fungus specimen the record is followed by the designation (U. W. Phan.).

GENERAL OBSERVATIONS

MYCOSPHAERELLA sp., which corresponds quite closely to the description of Sphaerella (Mycosphaerella) vivipari Wint. occurring on Polygonum viviparum L., has been found on living leaves of Polygonum virginianum L. collected near Leland, Sauk Co., August 24. The very conspicuous orbicular spots are reddish-gray, subzonate, mostly about 2–3 cm. diam., only one or two per leaf. The perithecia are hypophyllous, rather closely gregarious, blackish, subglobose, approx. 90–110 μ diam.; asci are short-pedicellate, cylindric to narrowly subclavate, about 42–45 x 8–9 μ; ascospores are hyaline, subfusoid, straight, with median septum, about 12–13 x 4–4.5 μ. In Sphaerella vivipari the asci are said to be 35 x 8–9 μ, the ascospores 12–14 x 3–4 μ.

MYCOSPHAERELLA sp. is hypophyllous on conspicuous spots on the leaves of Polygonum coccineum Muhl. var. pratincola (Greene) Stanf. collected at Madison, August 16. The spots are orbicular, about 5–2 cm. diam., dull purplish below, reddish and sometimes subzonate above. The perithecia are black, gregarious, subglobose, approx. 115–135 μ diam., the asci subclavate to cylindric, those appearing best matured running about 62–65 x 7.5–8.5 μ, the hyaline ascospores rather broadly subfusoid with one cell somewhat wider than the other, about 11–12.5 x 3.8–4.5 μ. Possibly parasitic. The leaves of this plant are attractive to certain chewing insects and are usually well riddled toward the end of the summer, as happened to these, so that it is difficult to determine how this might influence the development of fungi on them. This fungus does not seem referable.
to any of the several species of *Mycosphaerella* described as occurring on *Polygonum* and *Rumex*.

Shrubs of *Ribes missouriense* Nutt. sometimes show a striking development of ascomycetous fungi on white, bleached areas on the bark of twigs of the previous year's growth. *Didymosphaeria* sp. occurred in profusion on the twigs of such a shrub observed near Cross Plains, Dane Co., July 18. The plant seemed vigorous and not very adversely affected, so the overall degree of parasitism appeared to be slight. Various cane blights of cultivated currants and gooseberries have been reported, but that just described does not seem to be among them.

**Dibotryon Morbosum** (Schw.) Theiss. & Syd., the black knot of cherry, occurs commonly on *Prunus virginiana* L. in the Wisconsin area, but has been thought to develop only rarely on *Prunus serotina* Ehrh. *P. virginiana* is shrubby and at most only a small tree, whereas *P. serotina* becomes a large tree, with its first branches many feet from the ground, so that the only specimens normally observable for the presence of black-knot are quite young and, as indicated, only exceptionally are infected. Recently at a location in Sauk Co., following a severe windstorm, the writer examined several large trees of *Prunus serotina* which had been uprooted and all were liberally festooned with black-knot cankers, so it seems likely that *Dibotryon* is not so very rare on black cherry after all.

**Rhytisma Licus-Canadensis** Schw., collected on leaves of *Ilex verticillata* (L.) Gray near Leland, Sauk Co., July 27, has the fruiting structures filled with vast numbers of hyaline rod-shaped microconidia, approx. 3–5 x 1–1.3 μ, presumably a condition preliminary to the development of the perfect stage.

**Pseudopeziza**, as it occurs on *Galium* in Wisconsin, has hitherto been represented only by specimens on leaves. At Madison in October 1962, however, a specimen was collected which was confined to the stems of *Galium obtusum* Bigel. It was immature and showed no developed apothecia, so it was overwintered out-of-doors until May 1963 when it was placed in a moist chamber for several days. At the end of this time a number of the apothecia showed a fully repand condition and mature asci were present, indicating a means of overwintering, with infection of the new growth in spring or early summer. Following J. J. Davis, this has been referred to in the Wisconsin lists as *Pseudopeziza autumnalis* (Fckl.) Sacc., but the name *Pseudopeziza repanda* (Fr.) Karst. seems currently to be that accepted by most authors. It has been reported on several species of *Galium* in Wisconsin. H. H. Iltis has recently examined our specimens critically as to host determination, in accordance with
present taxonomic treatment, and finds the host species to be as follows: *Galium labradoricum* Wieg., *G. obtusum* Bigel. and *G. trifidum* L. An earlier host determination of *G. tinctorium* L. is incorrect and must be deleted.

*Muhlenbergia sylvatica* Torr., collected in the Madison School Forest near Verona, Dane Co., September 25, 1962, bears on the culms of the lower portions of still living plants a very interesting, but still undetermined, Ascomycete which is perhaps dothidiaceous. The fructifications are black, narrowly linear, innate but strongly erumpent, and with at least a suggestion of a clypeate condition. Upon being placed in mounting fluid rounded clusters of aparyny-sate asci which are still basally attached to one another are readily separated from their dark-walled, thick-celled housing. The clavate asci are approx. 65–75 x 10–12.5 μ, the hyaline, fusoid ascospores 20–25 x 6–7.5 μ. This fungus appears to have developed parasitically. It fails to fit into any of the available keys for the Dothisideae, so perhaps belongs elsewhere.

**Puccinia Kuhniae** Schw. O, I occurred in profusion on a plant of *Kuhnia eupatoriioides* L. in the University of Wisconsin Arboretum at Madison, July 2. This uredinoid aecial stage seems to be rarely developed, or at any rate rarely collected, as there are no previous collections of it among numerous Wisconsin specimens in our herbarium, nor are there specimens on *Kuhnia* from any source. Our only other collection of the aecial stage is on *Brickellia lemmoni* Gray from Arizona.

**Uromyces Lepeolzeae-procumbentis** (Schw.) Curt, was reported by J. J. Davis as occurring on *Lepeolzea violacea* (L.) Pers. in Wisconsin, and there are two specimens, both collected July 25, 1904 at Waupaca, labeled as being on *L. violacea*. Recent examination of these specimens shows, however, that they cannot be *L. violacea*. The leaves appear to be those of *Lepeolzea capitata* Michx., so *L. violacea* must be deleted as a Wisconsin host for *U. lepeolzeae-procumbentis*.

**Phylosticta rosae** Desm. is the name which has been applied by various workers to specimens on rose from Wisconsin, and from various other sources, in the University of Wisconsin Cryptogamic Herbarium. The original description is vague and incomplete and one can only suppose that there is at best an element of gueswork in the naming. There does, however, seem to be an entity involved. The reddish-brown spots are orbicular and sharply defined. The pycnidia are epiphyllous and more or less concentrically-zonately arranged on the spots. The conidia are hyaline and fusoid, approx. 7–8 x 2–2.5 μ. The fungus is only marginally sphaeropsidaceous, since the fruiting structure approaches an acervulus.
PHYLLOSTICTA PHASEOLINA Sacc., as it appears in presumably authentic specimens, is characterized by rather thick-walled, black, gregarious pycnidia and by cylindric conidia approx. 6–7 x 2.5–3.5 μ. What is considered to be this species has been collected on Apios tuberosa Moench. in Wisconsin on several occasions, but in a collection made July 12 near Leland, Sauk Co., the seemingly mature pycnidia are flesh-colored on orbicular brownish spots and a small percentage of the conidia, which are in the size range of P. phaseolina, have a median septum, suggesting Ascochyta, many species of which have thin-walled flesh-colored pycnidia. In its effect on the host and in its general microscopic characters this fungus is very similar to an undetermined species of Ascochyta on the closely related Amplicarpus bracteata (L.) Fern., collected at the same station in 1962 and reported in my Notes 29.

PHYLLOSTICTA LAPPÆAE Sacc. was tentatively reported by J. J. Davis as occurring on Aretium minus Bernh, in Wisconsin, with the comment that the specimens might be referable to Phyllosticta decidua Ell. & Kell. In a specimen collected September 14 at Gov. Dodge State Park, Iowa Co., the pycnidia are on well-developed orbicular brown spots about .5–1.5 cm. diam. Most of the pycnidia have conidia about 6–7 x 3 μ, as described, but some contain fusoid conidia about 10–11 x 3–3.5 μ. If two organisms are present the spots would not indicate it, as they are very uniform.

PHYLLOSTICTA spp. indet. occur on 1) Onoclea sensibilis L. collected near Verona, Dane Co., July 3. The lesions are suborbicular, reddish-brown with ashen centers, approx. 1 cm. diam. The pycnidia are pallid brownish, very inconspicuous, gregarious, subglobose, about 75–85 μ diam., the conidia hyaline, subfusoid, 8–11 x 2.5–3.2 μ. 2) Anemone virginiana L. collected at Gov. Dodge State Park, Iowa Co., September 14. The spots are small, dull ashen with purplish borders. Pycnidia epiphyllous, black, suglogose, about 140–160 μ diam., the conidia hyaline with a faint greenish tinge, slender-cylindric, biguttulate, straight or slightly curved, approx. 6–8 x 13–17 μ. 3) Rhus glabra L. collected near Albany, Green Co., October 6, 1962. The pycnidia are scattered to gregarious on somewhat elevated sordid areas of indeterminate size. They are erumpent, black, subglobose, approx. 250–300 μ diam., with numerous hyaline microconidia 3.5–4 x .6–.7 μ. Leaves overwintered out-of-doors at Madison showed no further development after several days in a moist chamber. 4) Scrophularia marilandica L. collected near Leland, Sauk Co., August 24. The spots are oval, tan, purple-bordered, diaphanous, about .5–1 cm. diam. Pycnidia are subglobose, thin-walled and pallid flesh-colored, about 125–150 μ diam., the conidia hyaline, rod-shaped or subellipsoid, straight or slightly
curved, mostly biguttulate, (3–) 3.5–5 x 1.5–2.3 μ. In another specimen on the same host, collected at the same time in the same general area, many of the conidia are even smaller and bacterium-like, with only a few of the size specified above. 5) *Aureolaria pedicularia* (L.) Raf., collected August 8, near Dodgeville, Iowa Co. Pyenidia are black, flattened, prominently ostiolate, about 150 μ diam., the conidia hyaline, 5–6 x 1.5–1.8 μ. On the pods and possibly parasitic. Quite similar to other collections made on pods of the related *Aureolaria grandiflora* (Benth.) Pennell and *Castilleja sessiliflora* Pursh and reported on earlier in these notes. 6) *Eupatorium rugosum* Houtt. collected near Pine Bluff, Dane Co., July 20. The spots are tiny, angled, translucent, the pyenidia somewhat flattened, sooty grayish in color, only one or two per spot, about 100–115 μ diam., the conidia hyaline, broadly ellipsoid, 2.8–3.8 x 1.8–2.2 μ.

**Phoma** sp. occurs profusely on stems of *Helianthus grosseserratus* Mart. collected at Madison, Dane Co., October 10. The effect on the host appears devastating. The stems are black and rubbery, tending to lop over. The pyenidia are densely clustered around the stems in pustular areas about 2–3 inches in length. There had been no killing frost in the vicinity at this date, but the plants were stunted, had fully died back, and no good seed had been set. The pyenidia are subepidermal, rather deeply imbedded in the host tissue, globose, rather thin-walled, approx. 100–125 μ diam., while the conidia are of the micro-type, hyaline, straight or slightly curved, 5–7 x 1–1.3 μ.

**Neottiospora arenaria** Syd. parasitizes various species of *Carex* in Wisconsin and it, or a species very similar to it, has been collected in the fall on leaves of several grasses, including *Calamo-vilfa longifolia* (Hook.) Hack., *Aristida purpurascens* Poir. and *Sporobolus vaginiflorus* (Torr.) Wood. var. *inaequalis* Fern. All these leaves were dead when collected, so it seems probable that the fungus developed saprophytically.

**Ascochyta** sp. on *Polygonum hydropiper* L., collected September 5 near Connors Lake in the Flambeau State Forest, Sawyer Co., is similar in size of conidia to *Ascochyta polygonicola* Kab. & Bub. reported from Wisconsin on *Polygonum arifolium* L., but differs in having pyenidia of larger diameter, up to 200 μ. On *P. hydropiper* the lesions are dull purplish with reddish centers, somewhat oblong in shape and about 1–2 cm. long by .6–.8 cm. wide, extending mostly from one margin to the leaf midrib. The pyenidia are mostly epiphyllous, scattered to gregarious, dull yellowish-brown, and subglobose. The conidia are quite variable in size, the smaller mostly continuous, but the larger uniseptate, cylindric or subcylindric, obtuse, straight or slightly curved, mostly biguttulate, 9.5–14 x 2.8–4 μ.
ASCOCYHTA sp. occurs on a leaf of Mitella diphylla L. collected June 6 near Leland, Sauk Co. The lesion is circular, sordid brownish, about 8 mm. diam. with a yellowish halo. The pycnidia are amphigenous, loosely gregarious, pallid brownish, thin-walled, subglobose, approx. 110-125 μ diam. The conidia are hyaline, guttulate, mostly uniseptate, subcylindric, straight or slightly curved, about 6-10 x 2.5 μ. It seems possible that this is a more fully developed state of a fungus J. J. Davis assigned to Phyllosticta mitella Peck, which I discussed in my Notes 26 (Trans. Wis. Acad. Sci. Arts Lett. 49: 89. 1960). I have not found any other report of Ascochyta on Mitella.

ASCOCYHTA on Leonurus cardiaca L. in Wisconsin has been referred to Ascochyta nepetae J. J. Davis which was described as having conidia 10-14 x 3 μ. A specimen on Leonurus collected near Leland, Sauk Co., July 27, has conidia up to 17.5 x 5 μ, and mostly more than 3.5 μ wide, which lends some doubt to the determination and perhaps indicates a separate entity.

STAGONOSPORA sp. on Cinna latifolia (Trev.) Griseb. collected near Connors Lake, Flambeau State Forest, Sawyer Co., September 5, has large, thin-walled, almost colorless pycnidia and conidia, the latter mostly 16-20 x 2.6-3.2 μ, 1-2 septate, subcylindric or subfusoid. Many of the pycnidia contain, however, only hyaline, rod-shaped microspores. This does not compare well with Stagonospora intermixta (Cke.) Sacc., previously reported on C. latifolia in Wisconsin, which has 7-septate spores, about 30-50 x 3 μ, or sometimes longer, but seems closer to Stagonospora arenaria Sacc., which, according to Sprague, has spores 3- (1-4) septate, 25-60 x 2.5-5 μ, often 30-45 x 3.5-4.3 μ.

STAGONOSPORA sp. occurs in small amount on leaves of Kuhnia eupatoriaoides L. collected near Black Earth, Dane Co., August 17, 1962. The spots are sordid brownish, immarginate, orbicular, subzonate, approx. 2 cm. diam. Pycnidia are epiphyllous, pallid brownish, subglobose, approx. 140-165 μ diam., the conidia subhyaline, cylindric to subfusoid, ends obtuse, straight to slightly curved or sinuous, 1-3, mostly 2-3 septate. I have found no report of Stagonospora on Kuhnia or any closely related plant.

SEPTORIA PACHYSPORA Ell. & Holw., occurring on Zanthoxylum americanum Mill., was described as having spores 35-60 x 3 μ, 4-6 septate, and, in most specimens, they are about this size. In a collection made at Gov. Dodge State Park, Iowa Co., in September, however, many of the spores are much thicker, up to 7μ, and up to 9-septate, Stagonospora-like, but not longer than described.
SEPTORIA SANICULAE Ell. & Ev. was described on occurring on leaves of Sanicula marilandica L. collected by J. J. Davis at Racine, Wis. in November 1887. Davis later (Trans. Wis. Acad. Sci. Arts Lett. 9: 176. 1893) equated this with Septoria cryptotaeniae Ell. & Rau, stating that “Septoria saniculæ E. & E. should doubtless be placed here, the host plant having been erroneously determined.” S. saniculæ is described as having spores spiculiform, slightly curved, about 20 x 1 μ, or less, while S. cryptotaeniae is said to differ primarily in larger spots, larger pycnidia, and in spores 20–30 x 1¼–1½ μ. Sydow's Mycotheca germanica No. 2206 is labeled Septoria saniculæ Ell. & Ev. on leaves of Sanicula europaea L. and it has spots and spores in the size range described for S. cryptotaeniae. In the Wisconsin Cryptogamic Herbarium there is no Wisconsin specimen labeled Septoria saniculæ, nor do any of the specimens now marked as S. cryptotaeniae appear to be the collection on which S. saniculæ was based. Septoria sp. has recently been found on Sanicula marilandica collected at Gullickson's Glen near Disco, Jackson Co. This specimen has spores about 20–22 x 1 μ, but the few pycnidia noted are on extensive, indeterminate, dark brown areas of the sort usually associated on this host with Stagonospora thaspii (possibly also present). Thus, there is a Septoria on Sanicula marilandica, and furthermore it has spores very similar to those mentioned in the original description of Septoria saniculæ.

SEPTORIA (?) sp. occurs in scanty development on small, reddish, oblong lesions on leaves of Maianthemum canadense Deaf. collected August 1 near Sauk City, Sauk Co. The small, light-colored pycnidia, which verge on acervuli, are not over 50 μ diam. The conidia are hyaline, uniseptate, about 17–20 x 2–2.5 μ. Plainly not S. maianthemi West. which has spores 50–70 x 3 μ, nor yet an undetermined Septoria on this host which I reported in my Notes 13 (Amer. Midl. Nat. 41: 748. 1949).

SEPTORIA sp. occurs on leaves of Aralia nudicaulis L. overwintered out-of-doors at Madison and brought in for study in May 1963. When collected October 2, 1962 near Pine Bluff, Dane Co., the leaves were bleached except for patchy green areas (the “green island” phenomenon) on which numerous gregarious, black, largely immature pycnidia were present. A few contained some rather poorly developed scolecospores. On the overwintered leaves most, but not all, the pycnidia have numerous spores. The subglobose pycnidia are about 125–150 μ diam., the spores hyaline, acicular, continuous, straight or slightly sinuous, 35–70 x .6–1.6 μ. Some spores are a bit shorter, but it seems questionable whether they are fully mature. Septoria macrostoma Clements has been reported as occurring on Aralia nudicaulis in Colorado. This is No. 55 in Clem-
ent's "Cryptogamae Formationum Coloradensium", issued in 1906, and apparently is represented only by the type specimen in the National Fungus Collections. According to Dr. C. R. Benjamin, who kindly loaned the specimen, publication was effected through distribution of the exsiccati, but it appears that in the case of Septoria macrostoma the Latin indication of host appearing on the label is insufficient to be considered an adequate description, and therefore the name is not valid. Examination of the Clement's specimen indicates that most of the pycnidia are sterile, but one mount was finally obtained which showed some spores. These were hyaline, acicular, more or less curved, approx. 50–90 x 1–1.5 μ. The pycnidia are quite similar to those of the Wisconsin specimen and it seems likely that a single entity is involved. Some years ago a specimen doubtfully assigned to Septoria was collected on Aralia hispida Vent. in Juneau Co. (Trans. Wis. Acad. Sci. Arts Lett. 46: 144. 1957). This had pycnidia 115–125 μ and spores 55–75 x 1.5 μ similar in size range to the specimens on A. nudicaulis, but the overall aspect is quite different and it seems improbable that it is the same. Septoria aralae Ell. & Ev., described on Aralia californica Wats., has spores 18–27 x 1.2–1.5 μ and pycnidia only 70–75 μ diam. It would seem that any description of the fungus on A. nudicaulis should be deferred until better characterized material of the current season can be obtained, as overwintering in a wire cage may perhaps tend to cause deviations from the normal.

Septoria sp. developed on leaves of Aster lateriflorus (L.) Britt. collected October 10, 1962 at Tower Hill State Park, Iowa Co., and overwintered out-of-doors at Madison until May 1963. As collected, the pycnidia contained no spores, were subglobose, black, approx. 140–165 μ diam., and were closely gregarious on small, angled, brownish spots on otherwise still green leaves. After overwintering the pycnidia were found to contain numerous acicular, hyaline spores, straight or slightly curved, appearing continuous, about 35–50 x 1–1.5 μ. Septoria atropurpurea Peck and S solidaginicola Peck have been reported on Aster lateriflorus in Wisconsin, but this fungus seems closer to S. astericola Ell. & Ev. so far as spore dimensions are concerned, although not in the large and conspicuous pycnidia.

Gloeosporium robergei Desm. (Monostichella robergei (Desm.) Hoehn.) is fairly common on both Ostrya virginiana (Mill.) K. Koch and Carpinus caroliniana Walt. in Wisconsin. In my Notes 20 (Trans. Wis. Acad. Sci. Arts Lett. 48: 170. 1954) I discussed a microconidial form on Ostrya noted by both J. J. Davis and me, in its possible relationship to G. robergei and to G. carpinicolum Ell. & Dearn., reaching the conclusion that, while it might be connected
with *G. robergei*, it could scarcely be identical with *G. carpinicolum*. A very similar and perhaps identical microconidial fungus was collected on *Carpinus caroliniana*, September 15, 1962, in the Leopold Memorial Tract, Sect. 1, Town of Honey Creek, Sauk Co. The numerous small, flesh-colored epiphyllous acervuli are scattered to gregarious on conspicuous, brownish, orbicular blotches approx. 1 cm. diam. In section the acervuli appear to be subcuticular, about 80–110 μ diam. by about 15–20 μ in elevation. The slender conidiophores are quite closely ranked and the numerous, hyaline, rod-shaped conidia are approx. 4–6 x 1.7–2.2 μ. This would appear to belong in *Cylindrosporella* Hoehn, as delineated by von Arx in his revision of *Gloeosporium*.

**Colletotrichum** sp., which may be parasitic, occurs on a suborbicular lesion about 2 cm. diam. on a leaf of *Jeffersonia diphylla* (L.) Pers. collected in the University of Wisconsin Arboretum at Madison, September 25, 1962. The lesion is tan with a narrow dark brown border, the whole surrounded by a yellowish halo. The numerous acervuli are gregarious and epiphyllous. The rather rigid, straight setae are clear deep brown, 1–2 septate, slightly paler near the subbotusse tip, approx. 40–100 x 4–6 μ, the hyaline conidia fusiform or subfalcate, 17–20 x 3.5–4 μ.

**Sphaceloma** (?) sp. on *Stipa spartea* Trin. has been collected in the Madison area on two occasions, in 1959 and recently August 10, 1963. The first collection was sent to Jenkins and Bitancourt who failed to find good fruiting, but the second appears better developed and worthy of mention. The lesions are very small, on the order of 1 mm. x .3 mm., somewhat ellipsoid, often confluent in groups along the adaxial surface of the narrow, strongly ribbed leaf, with narrow dark border and ashen center on which the fungus is produced, and which consists of pulvinate agglomerations of dematiaceous, pseudoparenchymatous mycelium, which may or may not be basally connected with one another. In section the fungus appears intraepidermal, or perhaps even more deeply seated, and the cells are elongate and quite closely packed. Some measurements of individual mycelial aggregates are: 55 μ wide by 20 μ high, 65 x 25 μ, 35 x 25 μ and 75 x 25 μ. Hyaline, ellipsoid conidia, about 5.5–6.5 x 2.6–3 μ, are scantily produced, but none have been seen attached. The lesions are very sharply defined on the otherwise healthy green leaves and there seems to be no doubt of the active parasitism of the fungus.

**Mollisia dehnia** (Rabh.) Karst. is a devastating parasite of *Potentilla norvegica* L. var. *hirsuta* (Michx.) Lehm. with the very numerous repand apothecia frequently almost completely covering the stems and principal veins of the host plants. In a heavy devel-
opment of this, noted at Madison, August 12, 1962, most of the apothecia were in turn overgrown by a so far undetermined, sub-hyaline moniliaceous fungus which may well have been parasitic, as the overgrowth was closely confined to individual apothecia and did not overrun them as a group. The very numerous, globose, hyaline conidia have each a definite apiculum, marking the point of attachment, and are approx. 6–7.5 μ diam. The mycelium is irregularly dichotomously branched, hyaline distally, but tending to be grayish or subfuscous below. The overall effect is macroscopically reminiscent of the fructifications produced by lime-bearing slime-molds, such as Physarum cinereum Pers. I have found no reports of any parasite on Mollisia.

Botrytis spp., possibly parasitic, occur on 1) leaves of Ranunculus recurvatus Poir. on large, marginal, broadly wedge-shaped, sordid grayish subzonate lesions, collected at Gov. Dodge State Park, Iowa Co., July 10; 2) large, marginal, orbicular to wedge-shaped brown lesions on leaves of Caltha palustris L., collected on Glidden Scenic Drive near Valmy, Door Co., June 29. The lesions have a more or less sharply defined darker border, are from approx. 1–5 cm. diam. and occur on otherwise normal green leaves; 3) a large (3.5 cm. diam.) orbicular, markedly zonate brown lesion with narrow darker border on a leaf of Menispernum canadense L., collected at Madison, July 25, 1962, and very sharply defined. All these lesions are similar to others noted on diverse hosts in Wisconsin through the years, but whether the same species of Botrytis is involved is still uncertain.

Botrytis sp. developed consistently from lenticular black sclerotal structures on stems of Vicia villosa Roth collected October 11, 1962 near Gibraltar Rock County Park, Columbia Co., and held out-of-doors over winter at Madison. The stems were brought indoors in May 1963 and held in a moist chamber for three days, when examination showed strong growth of the Botrytis. The conidiophores arise from the sclerotia in compact tufts which become divergent and spreading upwards. They are dark brown, granulose, quite straight, septate, 16–18 μ diam. and 700–1200 μ or more in length, branching dichotomously, more or less elaborately, near the apex where sterigmata are produced on the slightly inflated tips of the ultimate branchlets. The conidia are grayish-hyaline, broadly obovate, 13–15 x 15–17.5 μ, with a noticeable basal protrusion at the point of attachment to the sterigma. This is evidently not identical with Botrytis viciae Greene (Trans. Wis. Acad. Sci. Arts Lett. 48: 114. 1958), described as occurring on leaves of Vicia villosa, which has larger conidia and conidiophores which are more delicate and less intricately branched. Because of the lateness of the season
there was no positive indication of parasitic development on the already dead stems, but parasitism seems probable in view of the confined and restricted growth of the fungus from the sclerotia.

**Cryptostroma corticale** (Ell. & Ev.) Greg. & Wall. (*Conisporium corticale* Ell. & Ev) occurs in the bark of hard maple pulp sticks when they are stored prior to usage by paper mills. A specimen has recently been received which developed in the storage yard of a mill at Tomahawk, Lincoln Co., in 1962. The black, powdery spores are produced in great numbers and are said to cause allergic reactions in paper mill workers who inhale them. Gregory and Waller state (Trans. Brit. Mycol. Soc. 34: 579–597. 1951) that in England this fungus actively parasitizes *Acer pseudoplatanus* L. and they further state there are indications it may be parasitic on *Acer saccharum* Marsh. (hard maple) in Wisconsin, and on hickory and basswood as well.

**Ramularia heraclei** (Oud.) Sacc. is very common on *Heracleum lanatum* Michx. in Wisconsin. In late August numerous small, sooty, semi-translucent, subglobose pycnidia about 75–100 μ diam., containing large numbers of hyaline microconidia, approx. 4–5 x .8 μ, were observed on old *Ramularia* spots in a specimen collected near Leland, Sauk Co. Some of this material was held over winter without any further development.

**Septocylindrium** sp. is epiphyllous on strikingly sharp lesions on *Aster sagittifolius* Willd. collected July 18 near Cross Plains, Dane Co. The spots are rounded or somewhat angled, with wide, dark purple margins and ashen centers, and are mostly about 2–4 mm. diam., sometimes numerous on any one leaf. The catenulate conidia are hyaline, narrow-cylindric, (16–)22–38 (–48) x 2.2–2.8 μ, 1–3 septate, produced from short, hyaline conidiophores, approx. 10–14 x 3–4 μ, some of which are compactly geniculate with numerous scars. The conidiophores may occur a few clustered together, or individually, and the fruiting is quite diffuse. As in other specimens of this nature the conidia quickly fall away and the material in hand is scarcely suitable for formal descriptive purposes.

**Cercospora leptandrae** J. J. Davis, occurring in Wisconsin on *Veronicastrum virginicum* (L.) Farw. normally has conidia 20–75 x 5–8 μ, many of them subcylindric. However, in a specimen on this host collected at Madison, August 16, most of the conidia are narrowly obclavate and are quite similar to those of *Cercospora tortipes* Davis which occurs on *Veronica setellata* L., but the conidiophores are not fascicled as in the latter species, so perhaps the recent collection represents a bridging form between typical *C. leptandrae* and *C. tortipes*. 
Leaves of *Scirpus cyperinus* (L.) Kunth. var. *petiolaris* Fern collected August 20 at Dickey Creek, Black River State Forest, Jackson Co., bear numerous, black, seriate pycnidia (or acervuli?) in inconspicuous rows. These structures are deeply immersed below the leaf surface, not more than 30–50 μm diam., and quite imperfectly developed above. Hyaline microconidia, about 3–3.5 x 1 μm, are borne on closely ranked very slender conidiophores which line the entire inner surface. Associated with the microconidia, but not seen within the fruiting structures, are a few hyaline scleocospores.

*Aster umbellatus* Mill. collected in the Flambeau State Forest near Oxbow, Sawyer Co., September 4, bears small, elevated acervuli on rounded yellowish to brownish areas on the upper surface of the otherwise still green leaves. The acervuli are about 40–60 μm diam. at the base and had produced hyaline, allantoid microconidia about 5–6 x 1.2–1.5 μm. Some of the acervuli show considerable sclerotization basally, and they are associated with what appear to be immature perithecia which are deeply sunken in the host tissue, in contrast to the more or less superficial acervuli.

**ADDITIONAL HOSTS**

The following hosts have not been previously recorded as bearing the fungi mentioned in Wisconsin.


**ERYSPIHE POLYGONI** DC. on *Aconitum noveboracense* Gray. Sauk Co., near Sauk City, August 1.

**PODOSPHAERA OXYACANTHAE** (DC.) DeBary on *Amelanchier laevis* Wieg. Iowa Co., Sect. 17, Ridgeway Twp., June 17. Infected trees showed spectacular witches' brooms, resulting apparently from the combined effect of the powdery mildew and an infection of the conidial stage of *Apiosporina collinsii* (Schw.) Hoehn. There was no evidence of insect action in this connection. When these same trees were observed again in late August they appeared to have died. This seems to be the first record of *Podosphaera* on a species of *Amelanchier* in Wisconsin.

**UNCINULA SALICIS** (DC.) Wint. on *Salix adenophylla* Hook. (cult.). Dane Co., Univ. Wis. Arboretum at Madison, October 10.

Undetermined powdery mildews in the conidial stage only have been observed on the following hosts not previously listed as bearing these fungi in Wisconsin: 1) *Alnus vulgaris* Hill. Dane Co., Madison, November 15; 2) *Viola tricolor* L. Dane Co., near Cross
Plains, June 24; 3) Echinacea angustifolia DC. Dane Co., Madison (Univ. Wis. Arboretum), September 6, 1962.

*Gnomonia ulmea* (Schw.) Thum. on *Ulmus carpinifolia* Gleditsch, *U. parvifolia* Jacy. and *U. pumila* L. Columbia Co., near Arlington, August 14. These trees were all in a plantation established by the state with a view toward developing climate-hardy elms which will also be resistant to Dutch Elm disease.


*Ustilago macrospora* Desm. on *Elymus canadensis* L. Green Co., near Monticello, July 6.


*Phyllosticta populina* Sacc. on *Populus deltoides* Marsh. Sauk Co., near Leland, September 26. Referred to this species with some doubt. This is said to be associated with the common *Septoria musiva* of *Populus*, but half a dozen mounts have failed to reveal any *Septoria*, although at the time of collection in the field it was supposed that the spots had been caused by *Septoria*. The large black pycnidia are up to 200 μ diam., in a few cases even more, the
hyaline conidia about 4–6 x 2–3 μ, ellipsoid or subfusoid. Davis originally reported this fungus on *Populus deltoides* from Wisconsin, but later redetermined the host as *P. nigra* L. var. *italica* DuRoi, which it does appear to be.

**Phyllosticta livida** Ell. & Ev. on *Quercus ellipsoidalis* E. J. Hill. Dane Co., Madison, October 10.

**Phyllosticta amaranthi** Ell. & Kell. on *Amaranthus retroflexus* L. Dane Co., Madison, August 16.

**Phyllosticta dearnessii** Sacc. on *Rubus pubescens* Raf. Sawyer Co., near Oxbow, Flambeau State Forest, September 4.

**Ascochyta aquilegiae** (Rabh.) Hoehn. on *Delphinium* sp. (cult.) Dane Co., near Mt. Horeb, July 21. The host is the tall garden plant sometimes called *Delphinium* "cultorum".


**Darluca filum** (Biv.) Cast. on *Coleosporium delicatulum* Hedge. & Long II on *Solidago graminifolia* (L.) Salisb. Dane Co., Madison, August 27, 1962.

**Stagonospora baptisiae** (Ell. & Ev.) J. J. Davis on *Baptisia tinctoria* (L.) R. Br. Dane Co., Madison, Univ. Wis. Arboretum, August 3.

**Septoria passerinii** Sacc. Microsporous on *Elymus villosus* Muhl. Sauk Co., near Leland, July 12. This the stage to which the name *Septoria microsora* Ell. has been applied and is similar to Wisconsin collections on other species of *Elymus*.


SEPTORIA NEMATOSPORA J. J. Davis on Carex deweyana Schwein. Door Co., Peninsula State Park, June 16, 1957. Coll. H. R. Bennett. Also noted on specimens of this host from Adams, Ashland and Florence counties.


HAINESIA LYTHERI (Desm.) Hoehn. on Hamamelis virginiana L. Sauk Co., near Leland, August 24. On Rubus pubescens Raf. Sawyer Co., near Oxbow, Flambeau State Forest, September 4. The Sclerotiosis stage is also present in this specimen.

COLLEOTRICHIUM MADISONENSIS H. C. Greene on Carex emoryi Dewey. Columbia Co., near Wyocena, July 18, 1961. This occurs with Septoria caricens Pass. in a specimen so labeled.


RAMULARIA ASTERIS (Phil. & Plowr.) Bub. on Aster prenanthoides Muhl. Sauk Co., near Leland, July 12.

CERCSEPTORIA VERMIFORMIS (Davis) Davis on Corylus cornuta Marsh. Sawyer Co., near Oxbow, Flambeau State Forest, September 4. Associated with, and evidently reaching the peak of development after most of the large Cercoseptoria spores have fallen away, is a microspore stage characterized by small, pulvinate, flesh-colored masses (acervuli?) of hyaline, continuous, rod-shaped conidia about 5.5–9 x .7–1 µ. These bodies are gregarious on the same large, orbicular, brownish lesions on which the Cercoseptoria was produced and, it seems, may possibly be the precursors of a perfect stage.


CERCOSPORA CIRCUMSCISSA Sacc. on Prunus americana Marsh. Iowa Co., Gov. Dodge State Park, August 15, 1962. A report by J. J. Davis of this species on Prunus pennsylvanica L. f. appears to be in error, as the host is Prunus serotina Ehrh. and the fungus Cercospora graphioideas Ell.


Tuberculina Persicina (Ditm.) Sacc. on Puccinia polygoni-amphibii Pers. I on Geranium maculatum L. Dane Co., near Verona, June 4.

Additional species

The fungi mentioned here have not been previously reported as occurring in the state of Wisconsin.

Gnomoniella Gnomon (Tode) House on Corylus cornuta Marsh. Sawyer Co., near Oxbow, Flambeau State Forest, September 4. On C. americana. Sauk Co., near Leland, September 26. Both specimens are immature, but the fungus is so characteristic as to leave no reasonable doubt as to identity. The perithecia are fully separate from one another, not in a pseudostroma as in Mamiana (Gnomoniella) Coryli (Batsch ex Fr.) Ces. & DeNot.

Puccinia Sporoboli Arth. var. Robusta Cumm. & Greene (Brittonia 13: 272. 1961) is the name applied to the variety which occurs on Calamovilfa in Wisconsin and elsewhere. This differs from the species proper on Sporobolus in having much broader teliospores (19–)22–29 (–35) μ vs. (14–)17–21 (–23) μ, in having urediospores with (3–)5–6 germ pores vs. 3 or 4, and somewhat larger aeciospores. This has been confused in the past with Puccinia amphigena Diet. with which it sometimes occurs in mixtures on Calamovilfa (Trans. Wis. Acad. Sci. Arts Lett. 47: 124. 1958). The only known Wisconsin aecial host of P. sporoboli var. robusta is Smilacina stellata, as has been established by J. W. Baxter (Pl. Dis. Rep. 46(10): 706. 1962). As stated by Cummins and Greene “There is no evidence that P. amphigena has aecial hosts other than species of Smilax.”

Rhizoctonia crocorum DC. ex Fr. (violet root rot) on Medicago sativa L. Green Co., 5 mi. E. of Argyl, October 16, 1962. Coll. E. W. Hanson, who estimates that 10–15% of the plants in a 19 acre field had been killed.

Phyllosticta ulmi-rubrae sp. nov.

Maculis conspicuis, fusco-purpureis, orbicularibus, ca. 5–2 cm. diam., saepe confluentibus, pyenidiis hypophyllis, carneis, subglobo-sis, sparsis vel gregaris laxe, interdum subzonatis, amplitudinibus variis, ca. 100–180 μ diam.; conidiis hyalinis, bacilliformibus, saepe biguttulatis, ca. 4–6 x 1.3–1.8 μ.
Spots conspicuous, dark purplish, orbicular, approx. 0.5–2 cm. diam., often confluent; pycnidia hypophyllous, flesh-colored, subglobose, scattered to loosely gregarious, occasionally subzonately arranged, variable in size, approx. 100–180 μ diam.; conidia hyaline, bacilliform, often biguttulate, approx. 4–6 x 1.8–1.8 μ.


The leaves were on shoots which were growing vigorously despite the lateness of the season.

A Phyllosticta which is very similar, and may be identical, was collected on the same host in Dane Co. in 1959 and was discussed briefly in my Notes 26 (Trans. Wis. Acad. Sci. Arts Lett. 49: 88. 1960). Phyllosticta ulmiciolca Sacc., of which P. melaleuca Ell. & Ev. may be a synonym, is reported as occurring on elm in Wisconsin but should, judging from specimens examined, probably be referred to Coniothyrium and certainly bears no resemblance to P. ulmi-rubrae.

Phyllosticta pruni-virginianae sp. nov.

Maculis conspicuis, orbicularibus, purpureo-brunneis, zonatis, ca. 0.5–1.5 cm. diam., saepe confluentibus; pycnidis epiphyllis, zonato dispositis, subglobosis vel fere globosis, pallido-brunneis, erumpentibus, (75–)100–160 (–190) μ diam.; conidinis hyalinis, elipsidois, late elipsidois, brevo-cylindraceis, vel rare subfusoides, 5–7 x (2–)2.5–2.7 (–3) μ.

Spots conspicuous, obicular, purplish-brown, markedly zonate, approx. 0.5–1.5 cm. diam., often confluent; pycnidia epiphyllous, tending to be zonately arranged, subglobose to almost globose, pallid brownish, erumpent, (75–)100–160 (–190) μ diam.; conidia hyaline, ellipsoid, broadly ellipsoid, short-cylindric, or rarely subfusoid, 5–7 x (2–)2.5–2.7 (–3) μ.


This fungus was first noted at Madison in 1959 and was mentioned in my Notes 26 (Trans. Wis. Acad. Sci. Arts Lett. 49: 90. 1960). Other specimens have been collected at Wildcat Mt. State Park, Vernon Co., September 13, 1960, and at Bohemian Valley near Middle Ridge, LaCrosse Co., August 21, 1963. The spots are not, or are only slightly confluent in the type specimen, but are notably so in the Madison and Bohemian Valley collections, so this feature is included in the description.
Phoma herbarum West. on Rumex crispus L. Jackson Co., Gullickson's Glen near Disco, August 21. The fungus appeared parasitic on elongate pallid lesions on the still green stem of the host. Assignment to this "catch-all" species must be somewhat tentative, but the specimen corresponds fairly closely to presumably authentic examples, such as Kabat & Bubak's *Fungi imperfecti exsiccati* No. 404. In view of the considerable diversity of the forms listed under this species, it seems desirable to present here a brief descriptive note of the Wisconsin specimen: Pycnidia yellowish-brown, somewhat flattened, with a large ostiole about 30–35 μ diam. sharply delimited by a ring of blackish cells, the overall pycnidial diameter approx. (180–)200–215(–235) μ; conidia very numerous, hyaline, mostly biguttulate, short-cylindric, ellipsoid or subfusoid, straight or slightly curved, (5–)5.5–7(–8) x (2–)2.5–2.8(–3.2) μ.

Ascochyta caryae sp. nov.

Maculis variis, orbicularibus vel angulatis, ca. 3–1.2 cm. diam., centratis pallido-brunneis, marginibus fuscis; pycnidii insignificis, immersis, sparsis vel gregariis, flavido-brunneis, subglobosis, ca. 95–140 μ diam.; conidiis hyalinis, uniseptatis, non constrictis, cylindraceis vel late cylindraceis, vel subfusoides nonnumquam, rectis vel curvis leniter, (6.5–)7–8.5(–10) x (2.8–)3–4(–4.5) μ.

Spots variable, orbicular to angled, approx. 3–1.2 cm. diam., centers light brownish, margins fuscous; pycnidia inconspicuous and immersed, scattered to gregarious, yellowish-brown, subglobose, approx. 95–140 μ diam.; conidia hyaline, uniseptate, not constricted at the septum, cylindric to broadly cylindric, or occasionally subfusoid, straight or slightly curved, (6.5–)7–8.5(–10) x (2.8–)3–4(–4.5) μ.


Five widely scattered infected trees were observed and it seems likely that an intensive search would have turned up more. There seem to be no reports of any Ascochyta on Carya. Ascochyta juglandis Bolsh. on the closely related walnut has pycnidia about 80 μ diam. and conidia 10–13 x 4–5 μ, often slightly constricted at the septum.

In 1952, at Madison, a well-defined ASCOCHYTA was collected on Verbena uralicifolia L. and was characterized in some detail (Trans. Wis. Acad. Sci. Arts Lett. 42: 70. 1953), although formal description was deferred. Since that time additional specimens on the same host have been collected in 1961, 1962 and 1963 at Gov. Dodge State Park, Iowa Co., and on the property of the Wisconsin Society for
Ornithology near Leland, Sauk Co. In 1963, at the latter station, the fungus was also found on Verbena hastata. Since there seems to be no further doubt as to the constancy of this organism, with its conspicuous and well-characterized lesions, it is here described:

Ascochyta cuneomaculata sp. nov.

Maculis magnis, conspicuis, cuneatis, purpureo- vel obscuro-brunneis, primum in apicibus vel marginibus; pycnidiiis sparsis vel gregariis, epiphyllis, inconspicuis, pallido-brunneis, subglobosis, ca. 125–185 μ diam.; conidiis hyalinis, uniseptatis, cylindraceis vel subfusoides, ca. 7–10 (−13) x 3–4.5 μ.

Lesions large, conspicuous, wedge-shaped, purplish-brown, becoming sordid brownish, mostly distal or at least marginal in origin; pycnidia scattered to gregarious, epiphyllous, inconspicuous, pallid brownish, subglobose, approx. 125–185 μ diam.; conidia hyaline, uniseptate, cylindric to subfusoid, about 7–10 (−13) x 3–4.5 μ.


Since the lesions eventually involve and kill back the entire leaf, the fungus is obviously a strong parasite.

As mentioned in the note cited above, it seems probable that A. cuneomaculata has a Melanopsamma perfect stage, but this has yet to be conclusively demonstrated.

Ascochyta kuhniae sp. nov.

Maculis conspicuis, circulis, marginibus late purpureis, centris albidis vel pallido-brunneis, translucidis, parvis, plerumque 2–4 mm. diam., interdum confluentibus; pycnidiiis unicis vel nonnullis gregariis in maculis, pallido-brunneis, subglobosis, ca. 120–135 μ diam.; conidiis hyalinis, uniseptatis, variis, cylindraceis vel subfusoides, rectis vel curvis modice, interdum ad septis constrictis leviter, (7−)10–12 (−13.5) x 2.7–3.5 μ.

Spots conspicuous and sharply defined, rounded, with wide purplish margins and whitish to pallid brownish translucent centers, mostly about 2–4 mm. diam., sometimes confluent; pycnidia one, or several clustered closely on the spot, light brownish, subglobose, about 120–135 μ diam.; conidia hyaline, uniseptate, variable in shape from cylindric to subfusoid, straight or somewhat curved, occasionally slightly constricted at the septum, (7−)10–12 (−13.5) x 2.7–3.5 μ.

The best developed pycnidia are marked by having the ostiole sharply delimited by a ring of thicker, darker cells about it. When infection occurs near the leaf margin marked curvature of the leaf is often produced at that point.

This is not identical with an undetermined *Ascochyta* on the same host reported on in my Notes 18 (Trans. Wis. Acad. Sci. Arts Lett. 42: 71. 1955). Although the conidial size is approximately that specified by J. J. Davis for the var. *parva* of his *Ascochyta compositarum*, the small, sharply defined spots are very different from those so characteristic of an *A. compositarum* infection.

**Leptothyrium astericolum** (Ell. & Ev.) comb. nov.


The pycnidia of this fungus are definitely not those typical of a species of *Phyllosticta* as they are imperfectly developed and of the type characteristic of the Leptostromataceae. J. J. Davis (Trans. Wis. Acad. Sci. Arts Lett. 26: 253. 1931) recognized that this organism is not a species of *Phyllosticta*, but failed to take action in the matter. Common on *Aster umbellatus* Mill. in Wisconsin. *Leptothyrium astericolum* seems distinct from *L. similisporum* (Ell. & Davis) Davis which usually occurs on species of *Solidago*, but which has also been found on *Aster macrophyllus* L. in Wisconsin. *L. astericolum* has shorter, much narrower, and more fusoid conidia.

**Fusarium tricinctum** (Cda.) Sacc. emend. Synd. & Hansen on *Sorghum vulgare* Pers. Waushara Co., Hancock, Summer 1962. Coll. E. W. Hanson, Identification confirmed by W. C. Snyder. This fungus causes a head blight of the developing sorghum.