NOTES ON WISCONSIN PARASITIC FUNGI, XXXII.

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The season of 1965 in southern Wisconsin was not very favorable for the development of parasitic fungi, owing to the continuation of drought conditions up to midsummer. Unless otherwise specified, all collections referred to in the following notes were made in 1965.

GENERAL OBSERVATIONS

VENTURIA sp. on Chamaedaphne calyculata (L.) Moench., collected in small amount near Trout Lake, Vilas Co., July 17, by J. Medler, does not seem identical with any of the members of this genus reported on Ericaceae in Wisconsin. The perithecia are hypophyllous on dead distal areas, gregarious but not crowded, developing well within the host tissue, but still erumpent, black, globose, thick-walled, up to about 125 \( \mu \) diam., with stiff black setae approx. 50–60 x 4 \( \mu \). The asci are 50–55 x 15–16 \( \mu \) broadly clavate or subovate, the ascospores about 20 x 7.5–8 \( \mu \), greenish hyaline with septum almost median, but with one cell slightly larger than the other.

PHYLLACHORA sp., collected on Phalaris arundinacea L. at Madison, October 30, 1964, unfortunately does not have mature ascospores. Orton, in his monographic treatment of North American graminicolous species of Phyllachora (Mycologia 36: 39. 1944), described Phyllachora phalaridis as a new species, known to him at that time only from the type locality in Massachusetts. The U. S. D. A. Index mentions no other species of Phyllachora on this host.

MYCOSPHAERELLA sp. occurs on spots primarily due to Ramularia plantaginis on a leaf of Plantago rugelii Dcne. collected August 10 near Leland, Sauk Co., and does not correspond to other species of Mycosphaerella reported on Plantago. Possibly it is connected with the Ramularia. The inconspicuous perithecia are grayish-brown, subglobose, about 75–85 \( \mu \) diam., the slender-clavate asci 36–38 x 6.5–7.5 \( \mu \), the hyaline, subfusoid ascospores ca. 8 x 3 \( \mu \).
MYCOSPHAERELLA sp. is associated with *Ascochyla compositarum* J. J. Davis on dead areas of leaves of *Heliopsis helianthoides* (L.) Sweet collected at Madison, September 3. The black, thick-walled subglobose perithecia are about 125-150 μm diam., the asci clavate, short-pedicellate, approx. 35-40 x 6-7 μm, the hyaline ascospores subfusoid, about 12 x 3 μm with median septum.

*PUCCINIA* sp. (or *UROMYCES*?), represented only by an amphiasporic stage, has been noted on a specimen of *Carex comosa* Boott collected by H. H. Iltis near Hope Lake, Jefferson Co., July 28, 1956. The amphiaspores range from oblong, subellipsoid or subfusoid to more or less broadly ovate, tend to be truncate at base and taper more or less above to a subacuminate apex, are ca. (30-)40-55 x (13-)14-16 (-18.5) μm, the wall golden-yellow, 0.8-1.2 μm thick at base and sides, 3-5 (-7) μm above, finely verruculose, the pores 2-3 (-4), equatorial or superequatorial. A few of the spores have fragments of pedicels still attached, but in most they have fallen away. Fig. 1 shows some of the amphiaspores and was provided by G. B. Cummins of the Arthur Herbarium at Purdue University, to whom the specimen was submitted for examination. It seems possible this may be connected with one of the varieties of *Puccinia caricina* DC.

*ALEURODISCUS OAKESII* (B. & C.) Cooke is the name usually applied to the thelephoraceous fungus associated with, and presumably causing, "patchy bark" of white oak, *Quercus alba* L., and less commonly bur oak, *Q. macrocarpa* Michx., in Wisconsin. This condition is very prominent on the large, open-grown white oaks in the woods on the University of Wisconsin Observatory.

**Figure 1.** Amphiaspores on *Carex comosa*. X800
property near Pine Bluff, Dane Co. Some of the trees have lost all, or practically all, the original bark from ground level to 20 feet or more up the trunk. Such trees are noticeably whiter and smoother than uninfected specimens and usually show many of the tiny, cup-like fruiting structures of the organism on the surface of the trunk. Large trees do not appear to be seriously damaged by the fungus, but it gives evidence of being at least mildly parasitic on struggling small oaks in the partial shade of the bigger trees. Some of these small trees are completely covered with the fungus and have died. It seems likely, from examination of cuts made into the trunks, that the cambium layer of the smaller trees has been invaded, thus in effect girdling them.

**Phyllosticta Nebulosa** Sacc. was reported in my Notes 31 as occurring on *Lychnis viscaria* L. in Wisconsin. Reliance was placed on named plants in a botanical garden, but examination of authentic specimens of *L. viscaria* indicates that though the plants so named are some species of *Lychnis*, they cannot be *L. viscaria*.

**Phyllosticta Minima** Ell. & Ev. has subglobose conidia about 7-8 x 5-6 μ. In a collection of this species on *Acer rubrum* L., made near Denzer, Sauk Co., July 31, a few of the pycnidia have conidia which are cylindric and biguttulate, about (4-)5-6(-6.5) x 1.7-2 μ. The spots are very sharply defined and the infection does not appear to be a mixture of species. *Phyllosticta minutissima* Ell. & Ev., which occurs commonly on maple, has much smaller conidia of a micro-type.

**Phyllosticta Diervillae** J. J. Davis on *Diervilla lonicera* Mill. was found in the Madison School Forest near Verona, Dane Co., July 25. All previous collections were made by Davis in extreme northern Wisconsin, the latest in 1923.

**Phyllosticta Wisconsinsensis** H. C. Greene described occurring on *Helianthus occidentalis* Ridd. (Trans. Wis. Acad. Sci. Arts Lett. 53: 211. 1964) has long-cylindric conidia (8.5-10-13(-16) x 2.5-3.5 μ and large pycnidia, often 200 μ or more in diam. An additional specimen on the same host, collected at Madison in 1965, is practically identical in type of lesion and in microscopic characters. Two specimens on the closely related *Helianthus rigidus* (Cass.) Desf., one collected in 1961 near Cassville, Grant Co., and the other in 1965 near Albany, Green Co., have very similar rounded to fusoid lesions and large pycnidia like those of *Ph. wisconsinsensis*, but the conidia are shorter, not more than 8 μ, and somewhat wider; similar to the conidia of *Phyllosticta favilllensis* Greene (Amer. Midl. Nat. 48: 50. 1952), described from a specimen on *Silphium integrifolium* Michx. and currently represented
in the Wisconsin Herbarium by four specimens on this host. The Albany and Cassville specimens on *H. rigidus* are being filed temporarily with the Phyllostictae indet. They appear, however, to be related to *Ph. wisconsinensis* rather than to *Ph. fawcillensis*.

Phyllostictae, appearing parasitic, but so far undetermined as to species, continue to be found on diverse hosts, as indicated in the following descriptive notes: 1) On *Pteridium aquilinum* (L.) Kuhn var. *latiusculum* (Desv.) Underw. collected near Leland, Sauk Co., August 31, 1964. On indeterminate, dull reddish-brown areas; pycnidia epiphyllous, black, subglobose, widely ostiolate, pseudoparenchymatous, small, about 60–75 μ diam., tending to be in lines following the venation; conidia hyaline of the micro-type, about 4.5–6.5 x .7–1 μ. 2) On *Quercus ellipsoidalis*. Collected at Madison September 14. Spots very sharply defined, rounded, with rather wide reddish-brown borders and very light brown centers, 4–6 mm. diam.; pycnidia epiphyllous, loosely to closely gregarious, shiny black, deeply seated in tissue, globose or subglobose, approx. 100–150 μ diam.; conidia subglobose to ovoid, 6.5–8 x 9.5–10.5 (–12) μ. *Phyllosticta globulosa* Thum., which also occurs on oak, is described as having subglobose or ovate-globose conidia 6–9 μ diam., but plainly differs in other characters. 3) On *Oxybaphus nyctagineus* (Michx.) Sweet collected in Dane Co., near Arena, July 8, 1964. Spots dull brown, small and marginal, usually bearing only one or two pycnidia, but occasionally more; pycnidia amphigenous, mostly epiphyllous, black, subglobose, about 125–175 μ diam., the ostiole delimited by a dense ring of black cells; conidia hyaline, narrow-fusoid, approx. 8–11 x 2.4–2.7 (–3) μ. The conidial shape and the rather large black pycnidia suggest that this may prove to be a species of *Phomopsis*, but no scholecospores were seen in the mounts studied. 4) On three specimens of *Caulophyllum thalictroides* (L.) Michx., the first collected July 6 at Gov. Dodge State Park, Iowa Co. The conspicuous spots are ashen with a very narrow yellowish-brown border, orbicular to oblong, .3–.7 cm. in short diam.; pycnidia epiphyllous, scattered, from somewhat flattened to subglobose, thin-walled, pallid yellowish-brown, small, about 50–75 μ diam.; conidia hyaline, subcylindric to subfusoid or broadly subfusoid, straight or slightly curved, about 4.5–8 (–10) x 2.4–3.2 μ. The second specimen was taken a few days later, July 14, at the same station. Here the lesions are large, effuse, sordid greenish-brown areas involving the distal portions of leaflets; pycnidia many, flesh-colored, about 100–150 μ diam.; conidia similar in shape to, but slightly larger than, the July 6 specimen. The third specimen was gathered August 28 at Wildcat Mt. State Park, Vernon Co. Here the conspicuous lesions are wedgeshaped, distal in situation, up to 5 cm.
long by 3 cm. at widest point, subzonate, tan, with narrow darker margin; pycnidia loosely gregarious, epiphyllous, rather dark brown and thick-walled, subglobose, about 125-200 μ diam.; conidia similar to those in the other two specimens. Perhaps all represent progressive stages in the development of the same thing. I have found no report on any Phyllosticta on Caulophyllum. 5) On Potentilla recta L. collected at Tower Hill State Park, Iowa Co., October 13. Very much like a Phyllosticta which occurred on Fragaria virginiana Dene., as reported in my Notes 26 (Trans. Wis. Acad. Sci. Arts Lett. 49: 89. 1960). In both specimens the zonate banding of the spots is similar, the conidiophores well-developed, the conidia correspond in size and shape, and the pycnidia are erumpent, but lighter in color and less markedly rostrate on Potentilla. 6) On Staphylea trifolia L. collected at Nelson Dewey State Park, Grant Co., September 19, 1961. The spots are ashen-brown, immarginate, irregular, approx. 1 cm. diam., pycnidia hypophyllous, gregarious, dark brown, subglobose, apparently without ostioles, about 75-90 μ diam.; conidia hyaline, short rod-shaped, 3-3.5 x .8-1 μ. 7) On Menyanthes trifoliata L. collected June 12 in Hope Lake Bog near Cambridge, Jefferson Co. The spots are tan with narrow darker border, rounded, about 4-6 mm. diam.; pycnidia epiphyllous, gregarious, light brown, pseudoparenchymatous, subglobose with prominent ostiole, about 80-110 μ diam.; conidia hyaline, rod-shaped, about 2.5-3 x .7-1 μ, very numerous. 8) On Scrophularia marilandica L., two specimens, from Gov. Dodge State Park, Iowa Co., August 23, and from near Leland, Sauk Co., August 24. Spots sordid brown, sometimes purple-bordered, ranging from rounded and only 2-3 mm. diam. to large irregular blotches; pycnidia epiphyllous, scattered to gregarious, pallid brownish, thin-walled, subglobose, ca. 90-140 μ diam.; conidia hyaline, ellipsoid to short-cylindric, quite variable in size, seeming to run somewhat smaller in the Sauk Co. specimen, but intergrading, approx. (3.5-)5-7(-8.5) x 1.5-2 μ. Similar to but better developed than specimens on this host reported on in my Notes 30. European species are described on Scrophularia, but none correspond in conidial size with the Wisconsin specimens. 9) On Pentstemon gracilis Nutt. var. wisconsinensis (Penn.) Fassett collected near Lodi, Columbia Co., June 7, 1960. Spots narrow, elongate, subtranslucent, ashen with brownish borders; pycnidia seriatly arranged, black, subglobose, approx. 135-175 μ diam., the ostiole delimited by a very thick ring of black, heavy-walled cells; conidia very numerous, hyaline, straight or slightly curved, narrowly cylindric, 4-6 x 1-1.3 μ. 10) On Aureolaria (Gerardia) pediculata (L.) Raf. collected near Leland, Sauk Co., August 14. Spots small, about 2-3 mm. diam., rounded, subzonate,
dark brown but often with a paler center; pycnidia epiphyllous, mostly closely crowded in the central portion of the spot, pallid sooty-brown, subglobose, approx. 125–150 μ diam.; conidia hyaline, ellipsoid to broadly ellipsoid, short-cylindric or occasionally subfusoid, biguttulate in some pycnidia, variable in size, (3.5–)5–7(-11) x 2–3(-4) μ. 11) On Triosteum perfoliatum L. Two specimens, the first from near Pine Bluff, Dane Co., September 5, 1964. Spots ranging from tiny, angled and ashen, about 1 mm. diam. to larger, indefinite, light reddish-brown areas; conidia hyaline, very small, 2.5–3 x .5–.7 μ. Similar material has been collected in August or later in several localities and twice leaves have been held out-of-doors over winter without any further development. The second specimen was taken September 12, 1964, at Gov. Dodge State Park, Iowa Co. Here the lesions are large, about 2–2.5 cm. diam., ovate and brownish, with a cinereous center; pycnidia epiphyllous, blackish, subglobose, approx. 125–150 μ diam.; conidia hyaline, ellipsoid, small, 3–3.5(–4.5) x 1–1.3 μ. 12) On Viburnum cassinoides L. (cult.) collected at Madison, October 5. Spots small, rounded, dark, elevated; pycnidia epiphyllous, black, subglobose, about 125–150 μ diam.; conidia hyaline, subcylindric or subfusoid, approx. 5–8 x 2.5–3 μ. 13) On Solidago canadensis L. from the Flambeau State Forest near Oxbow, Sawyer Co., July 23, 1964. Spots rounded and dark-bordered, with cinereous centers, small, about 1–2 mm. diam.; pycnidia epiphyllous, one or two per spot, pallid sooty-brown, thin-walled, globose, about 150–175 μ diam., the ostiole delimited by a ring of dark, thick-walled cells; conidia hyaline, narrow-cylindric, straight or slightly curved, often guttulate, approx. 6–10 x 1.8–2.3 μ. 14) A Phyllosticta very similar microscopically to the preceding occurs on Aster pinnatifolius Muhl. collected near Leland, Sauk Co., August 19, 1964. The fungus is hypophyllous on orbicular lesions 1–2 cm. diam., which are purplish above and dull yellowish below. 15) On Silphium perfoliatum L. collected near Leland, Sauk Co., September 19, 1964. Spots rather indefinite, mostly small and somewhat rounded, but becoming confluent over considerable areas, mottled dark gray and ashen; pycnidia epiphyllous, mostly rather closely clustered on, but not confined to, the lighter portions of the spots, small, black, globose, about 50–90 μ diam., without true ostioles, although some pycnidia have rounded, thin areas in the walls; conidialhyaline, short rod-shaped, 3–5 x .6–.8 μ. 16) On Helianthus giganteus L. collected near Leland, Sauk Co., August 12, 1964. Spots small, angled and ashen on larger indefinite brown areas; pycnidia epiphyllous, usually only one to a spot, black, subglobose, about 150–175 μ diam.; conidia hyaline, cylindric, 6–7 x 1.5–2 μ. 17) On Arctium minus Bernh. from Gov. Dodge State Park, Iowa
Co., October 1. Spots mottled, cinereous through blackish-brown, irregular in shape and size; pycnidia epiphyllous, scattered, dark brown, subglobose, about 150–175 μ diam.; conidia hyaline, cylindric, 4–5.5 x 1.5–1.8 μ, sometimes biguttulate.

**Coniothyrium** spp. indet. and possibly parasitic have been noted. 1) On *Salix discolor* Muhl. collected near Leland, Sauk Co., August 4, 1964. Spots small, fuscous, marginal; pycnidia epiphyllous, scattered, black, erumpent, subglobose, approx. 115–125 μ diam.; conidia greenish-gray, oblong or broadly ellipsoid, 5–6.5 x 2.5–3 μ. 2) On *Ulmus americana* from near Leland, Sauk Co., June 18. Spots sharply defined, usually only one or two to a leaf, pallid- to reddish-brown, with narrow darker borders, rounded, about 2–4 mm. diam.; pycnidia epiphyllous, more or less closely gregarious, black, rather thick-walled, subglobose, mostly about 100–150 μ diam.; conidia smooth, clear olivaceous-gray, broadly elliptic, 4–7 x 2.7–3.5 μ. Because many of the leaves in this large collection bear, on rather similar spots, the *Phyllosticta* which has in Wisconsin lists been doubtfully referred to *P. ulmicola* Sacc., it seems possible that the *Phyllosticta* was primary, especially since a few spots show a mixture of *Coniothyrium* and *Phyllosticta*. The form in hand does not in any way correspond to Tharp’s *Coniothyrium ulmi* (Mycologia 9: 116. 1917). 3) On Cotoneaster “melanocarpa” (cult.) collected at Madison, September 11, 1964. The spots are rounded or angular, about 2–5 mm. diam., essentially sordid- or rufous-brown, but the centers often appear cinereous, due primarily to a loosened and somewhat uplifted cuticle; pycnidia epiphyllous, erumpent and gregarious, appearing intraepidermal in origin, black, thick-walled, subglobose, approx. 100–160 μ diam.; conidia light grayish-olivaceous, oblong to broadly ellipsoid, or sometimes almost globoid, about 2.7–3.8 x 5–5.5 μ. 4) On *Acer negundo* L. from near Leland, Sauk Co., August 10. Spots orbicular, ashen and translucent, with narrow yellow-brown border, about .3–1 cm. diam.; pycnidia mostly epiphyllous, scattered, globose or subglobose, approx. 100–150 μ diam.; conidia very numerous, smooth, clear light gray, 4–5.5 x 2.3–3.5 μ. Evidently not *Coniothyrium negundinis* Tehon & Daniels, which occurred at the bases of twigs, had pycnidia twice as large, and smaller, olivaceous, spheri-cal to ovoid conidia.

**Phomopsis** sp. was present in profusion on still attached over-wintered fruit of a cultivated species of *Rosa* collected June 22 at Madison. The large, crowded, black, globose pycnidia are approx. 175–250 μ diam., the hyaline scolecospores ca. 18–22 x 1.2–1.6 μ,
from almost straight to sinuously curved, enlarged at one end, the other conidia subfusoid, 6–9 x 2–2.5 μ. Both types of spores are abundant. Parasitic in origin?

**Phomopsis** sp.? occurs on cinereous areas of leaflets of *Caragana arborescens* Lam. (cult.) collected at Madison, July 20. Pycnidia black, thick-walled, prominently ostiolate, gregarious to crowded, mostly epiphyllous, subglobose, variable in size, about 100–250 μ diam. Definite scelocospores were not seen, but conidia range from rather broadly fusoid to moderately slender in one group which run 7–10.5 x 3–3.8 μ, to a second group where they are about 12–13 x 2 μ at one end and tapering to 1 μ at the other, thus verging on a scelocosporous condition, with an aspect strongly suggestive of *Phomopsis*. *Phomopsis caraganae* Bond. on stems has fusoid conidia of similar size.

**Ascocysta** spp., ranging from well-developed to more or less presumptive, have been found on 1) *Apios tuberosa* Moench. collected at Gov. Dodge State Park, Iowa Co., July 6. Well characterized and appearing mature. Spots conspicuous, greenish to pallid brownish with narrow dark brown margin, translucent, orbicular, about 0.5–1.5 cm. diam.; pycnidia carneous, thin-walled, gregarious to crowded, subglobose, approx. (90–)125–175 μ diam.; conidia hyaline, subcylindric or subfusoid, 7–10 (–11) x (2.6–)3–3.5 (–4) μ, regularly uniseptate, occasionally slightly constricted at septum. In essentials this seems very similar to an undetermined *Ascocysta* reported in my Notes 29 (Trans. Wis. Acad. Sci. Arts Lett. 52: 236. 1963) and it seems likely that other specimens on both *Apios* and *Amphicarpa* with this type of lesion and pycnidia, referred doubtfully to *Phyllosticta phaseolina* Sacc., in reality belong here. More collections on both hosts would be desirable. 2) on *Convolvulus sepium* L., Madison, July 9, 1964. The blackish subglobose pycnidia are about 125 μ diam., the hyaline, guttulate, uniseptate conidia about 10–12 x 2.5 μ. The pycnidia are on the same type of reddish-brown, zonate spots characteristic of *Stagonospora convolvuli* Dearn. & House, so it seems possible this is merely a somewhat depauperate development of that species. 3) On *Polemonium reptans* L. collected near Leland, Sauk Co., July 15. Spots diaphanous, ashen-brown, orbicular to ovate, about 1 cm. diam.; pycnidia scattered to gregarious or even crowded, pallid brownish and thin-walled, with a well-defined ostiole delimited by a narrow ring of dark cells, subglobose, mostly 125–200 μ diam., even more in a few cases; conidia hyaline, short-cylindric, broadly ellipsoid, or subfusoid, a small number with a median septum, about 5–7.5 x 2.4–3 μ. The specimen appears well-matured, but perhaps more conidia would have developed septa in time. There seem to be no
reports of Ascochyta or Phyllosticta on Polemonium in North America. Ascochyta polemonii Cav. on cultivated *P. caeruleum* L. in Europe has conidia 12–14 × 3 μ. 4) On Glecoma (*Nepeta*) hederacea L. collected near Albany, Green Co., October 1, 1964. Spots rounded, sordid brownish with darker border, about 5 mm. diam.; pycnidia epiphyllous, gregarious, thin-walled, subglobose, about 100–125 μ diam.; conidia hyaline, cylindric, uniformly and markedly biguttulate, 5–7 × 1.8–2.2 μ. The conidia are much smaller than those of *Ascochyta nepetae* Davis which occurs on *Nepeta cataria* L. 5) On a leaf of Verónicastrum virginicum (L.) Farw. collected July 15 near Leland, Sauk Co. Spot blackened, strongly zonate, about 4 mm. diam.; pycnidia flesh-colored, subglobose, about 100–125 μ diam.; conidia uniformly uniseptate, hyaline with granular contents, cylindric and obtuse, about 7.5–10 × 3–3.5 μ. Directly centered on the reverse of the spot is a sorus of the microcyclic rust *Puccinia veronicarum* DC. In the same general area on September 11, on the same host, a possible *Ascochyta* was found on orbicular, blackish, zonate areas, about 1–2.5 cm. diam.; pycnidia sooty-brownish, thin-walled, subglobose, approx. 100–125 μ diam., scattered and very inconspicuous; conidia hyaline, cylindric, sparingly uniseptate, about 9–10 × 2–2.3 μ, mostly non-septate and smaller, about 4.5–7.5 × 1.3–1.7 μ. 6) On *Antennaria parlinii* Fern. collected August 31, 1964, near Leland, Sauk Co. Spots sordid brown with narrow darker margin, irregular in shape and involving the distal portions of the leaves; pycnidia epiphyllous, gregarious, black, subglobose, thick-walled, erumpent, approx. 125–150 μ diam.; conidia hyaline, cylindric, uniformly uniseptate, not constricted at septum, (11–)12–13 (–14) × 2.5–2.8 μ. The ratio of length to width of the conidia suggests that this might ultimately prove to be a *Stagonospora*.

*Aster prenanthoides* Muhl., collected near Leland, Sauk Co., August 12, 1964, bears on the living leaves a possibly parasitic and peculiar sphaeropsidaceous fungus which seems to fall between *Diplostelma* West. and *Chaetodiplostelma* Speg. There are no spots. The pycnidia are sooty brown, relatively thin-walled and pseudoparenchymatous, globose, about 110–225 μ diam., the ostiole small but sharply outlined by a ring of dark cells, hypophyllous, scattered and superficial on a small, loosely organized subiculoid network, the component hyphae of which are brownish and appear to originate as strands from wall cells at various points on the pycnidium. Conidia are hyaline, straight or slightly curved, cylindric, long-cylindric, or subfusoid, many appearing continuous, but many uniseptate and a few obscurely 3-septate, approx. (15–)17–30 (–33) × 3.5–5 μ.
SEPTORIA sp. is strictly confined to the spermogonial surface of aerial sori of *Puccinia dioicae* P. Magn. on leaves of *Solidago patula* Muhl. collected July 1 near Leland, Sank Co. The sori have a conspicuous blackish-purple margin, quite unlike sori on adjacent leaves which bore the rust alone. The tiny black pycnidia are only about 35–50 μ diam., the hyaline acicular spores approx. 15–20 x 1 μ.

**HENDERSONIA sp.**—a very large-spored form—occurs on conspicuous spots on leaves of *Spartina pectinata* Link collected at Madison, September 3, 1965. This spotting of *Spartina* has been noted over the years at various stations, and specimens have been preserved. In my Notes 20 (Trans. Wis. Acad. Sci. Arts Lett. 43: 173. 1954) I described the spots of a specimen collected in 1952 near Mazomanie, Dane Co., as “remarkably conspicuous, large, orbicular . . . with grayish centers and wide, purplish-brown borders on the upper surface of the leaves. On the lower surface and coinciding with the spots are wefts of sordid-whitish, largely superficial, yet closely appressed mycelium. Microscopically this mycelium is thin-walled, septate, and somewhat verrucose. . . .” At that time I overlooked the very scanty and inconspicuous development of the *Hendersonia*, as I did in subsequent specimens, until the 1965 Madison collection, where there is a relatively profuse development of pycnidia. Taking all the specimens into account, one finds that the pycnidia are from scattered and very few in some to gregarious and fairly numerous in others. They are subglobose, about 160–200 μ diam., sooty-olivaceous, with a small ostiole delimited by a ring of dark, thick-walled cells. The large conidia are from almost straight to variously curved, widest at or near the middle, ends obtuse, clear yellowish-olivaceous, 6–9, but mostly 7-septate, approx. (60–)75–100(–120) x (11–)12–13(–15) μ. The relation of the superficial hypophyllous mycelium to the *Hendersonia* is not clear, although it occurs in greater or less development on the reverse of all the spots and is confined to them.

**CYLINDROSPORELLA (?) sp.** occurs on mottled green and brownish areas of leaves of *Podophyllum peltatum* L. collected May 29 near Albany, Green Co. The subcuticular acervuli are most inconspicuous and even in section discernible with difficulty. They are very slightly concave to almost plane and the conidiophores on them very short, almost obsolete. The conidia, which are produced in considerable numbers, are hyaline, cylindric or subcylindric, straight or slightly curved, (6–)8–10(–12) x 1.2–2.6 μ. This plainly has no connection with *Septotinia podophyllina* (Ell. & Ev.) Whetzel, which has much larger septate conidia and lesions of a different aspect.
COLEOTOTRICHUM spp. indet. have been noted on several hosts as possible parasites. 1) On leaf midribs of Corylus americana Walt. collected near Pine Bluff, Dane Co., September 5, 1964. The leaf adjacent to the midrib is brownish and discolored, suggesting parasitism. The fructifications are elongate and deep-seated in the tissue, the stiff setae black below, somewhat paler toward the tip, 1–2 septate, approx. 65–150 × 5–6 µ (somewhat wider at the very base), a few shorter and narrower, mostly in pairs or small groups. The conidia hyaline, falcate, 20–23 × 2.5–3.2 µ. 2) On Asarum canadense L. collected in Wyalius State Park, Grant Co., June 24. Spots blackened, orbicular, about .5–1 cm. diam.; acervuli epiphyllous, scattered to gregarious; setae rather coarse, fascicled and prominent, clear purplish-brown below to slightly paler above, tapering gradually to the subacuminate tips, slightly to moderately curved, approx. 90–140 × 5–7 µ, 2–5 septate; conidia hyaline, falcate to almost lunate, about 17–23 × 2.5–3 µ. The affected leaves were growing among and surrounded by healthy leaves on a high, deeply shaded bluff where frost damage could scarcely have been a factor. Possibly parasitic, but Asarum canadense is notable for lack of parasites, with the only so far determined fungus reported on it from Wisconsin or elsewhere being Synchytrium asari Arth. & Holw. 3) On dead upper portions of stems of Desmodium bracteosum (Michx.) DC, var. longifolium (T. & G.) Rob. from the New Glarus Woods Roadside Park, Green Co., October 1, 1964. The plants were, in the main, still living and it seems probable that the fungus caused the death of the stem tips. No setae were observed, but the organism is perhaps referable to Coleototrichum in the usage of von Arx. The acervuli occur in profusion, are dark, subepidermal, small, mostly only about .2 × .1 mm.; conidiophores closely compacted and olivaceous below, but paler above in the free measurable portion where they are from about 8–10 × 2.5–3 µ, appearing to be confined mostly to the margin of the acervulus; conidia subhyaline, cylindric, about 11–15 × 3.5–4.5 µ. 4) On Asclepias exaltata (L.) Muhl. collected at Madison, September 11, 1964. Lesions elongate, pallid greenish with wavy black borders, approx. .5 cm. wide by 2–4 cm. long; acervuli epiphyllous and gregarious; setae peripheral, slender, flexuous, uniform clear dark brown, little if any paler at the subacuminate tips, sparingly septate, approx. 60–85 × 3.5–4.5 µ; conidia hyaline, straight, cylindric and obtuse, occasionally subfuscoid, about 14–17 × 3.5–5.5 µ.

MARSSONINA (?) sp. occurs on Quercus velutina Lam. collected at Madison, October 3, 1964. The flesh-colored acervuli are hypophyllous on elongate brownish areas along the principal veins. In my Notes 26 (Trans. Wis. Acad. Sci. Arts Lett. 49: 95. 1960) I
mentioned a very similar fungus on *Quercus alba* L., where the conidia "vary from rarely obclavate to cylindric, broadly cylindric or ellipsoid, or curved *Marssonina*-like, continuous so far as observed, 18–36 x 6.5–9 μ." One would suspect that the great irregularity in conidial size may be the result of late season development, with accompanying wide temperature extremes, but even so this organism does not seem close to any fungus currently reported from this area on either white or black oak.

**Botrytis** (B. vulgaris Fr. ?) appears strongly parasitic on elongate brownish lesions which encircle the stems of greenhouse-grown tobacco, *Nicotiana tabacum* L., at Madison in September 1965. The fungus is fruiting profusely, with whorls of subhyaline, short-clavate branches produced near the tips of comparatively long, septate, brownish-olivaceous conidiophores. The conidia are grayish, smooth, broadly elliptic, oval or oblong, 8–10 (–13) x 6–9 μ.

**Cladosporium** sp., appearing parasitic, is epiphyllous on *Andromeda glaucophylla* Link collected in Hope Lake Bog near Cambridge, Jefferson Co., June 12. The spots are rounded, reddish-purple, small, 1–2 mm. diam., or confluent and larger, mostly marginal on the narrow leaves; conidiophores loosely clustered from a substromatic base to fascicled from a well-developed stroma, multiseptate, from almost straight to slightly curved or sinuous, a few subgeniculate, simple, subdenticulate, clear brown below, becoming pallid above, 35–60 x 3–4 μ; conidia ellipsoid to subfusoid, continuous or 1-septate, catenulate, roughened, grayish-olivaceous, about 10–12 (–15) x 3–4 μ. I have not found any reports of *Cladosporium* on *Andromeda* or related plants.

**Cercospora** sp. in small amount, has been observed on *Gaultheria procumbens* L. collected by J. A. Curtis in the Bittersweet Lake Scientific Area near Eagle River, Vilas Co., July 25, 1963. This bears no resemblance to *Cercospora gaultheriae* Ell. & Ev. nor to other species listed on Ericaceae in Chupp's monograph. The fungus is hypophyllous and quite diffuse, the conidiophores clear brown, markedly geniculate and tortuous, often rather intricately branched and intermingled, but not compacted into a stroma, about 4.5–6 μ diam. at the base, several-septate and up to 150 μ long. The conidia are dilute olivaceous, narrowly obclavate to almost acicular, straight to moderately curved, 5–11 or more septate, base subtruncate, 55–105 x 3.5–4.5 μ.

**Alternaria** sp. in an apparently parasitic condition on *Euphorbia esula* L. was first noted at Madison in 1949 and commented upon briefly in my Notes 14. The material was rather old, however, and not suitable for close study. In 1965, in the same general location,
much fresher and quite plainly parasitic *Alternaria* was collected and studied on this host. The spots are sordid brown with a narrow darker border, rounded or angular in basic outline, usually extending from about the midrib up to, and involving, the margins of the narrow leaves, subzonate and approx. 2–5 mm. diam. The conidiophores are amphigenous, but most prominent on the upper leaf surface, and appear to be produced from stomates in a few cases, in broadly diverging groups of half a dozen or more. They are clear olivaceous-brown, 3–4 septate, up to 60 x 4 μ and from almost straight to curved and mildly tortuous-geniculate. The main spore bodies are olivaceous-gray or olivaceous, broadly ovate to clavate, about 28–50 x 12.5–14 (–15) μ, the narrow beaks subhyaline to dilute olivaceous, approx. 15–30 (–35) x 2–3 μ. The spores with beaks mostly run about (50–)60–70 (–80) x 12–15 μ with 3–9 transverse septa and about 2–5 vertical septa. *Alternaria brassicae* (B.) Sacc. is reported in Seymour’s Index as occurring on *Euphorbia esula*, but according to Neergaard in his authoritative “Danish Species of *Alternaria and Stemphylium*, *A. brassicae* is a much coarser species. The Wisconsin specimen likewise does not correspond with *Macrosorium (Alternaria) euphorbiae* Barthol., which has wider spores and much longer beaks.

**Graphiothecium vinosum** J. J. Davis was described (Trans. Wis. Acad. Sci. Arts Lett. 18(1) : 90. 1915) as occurring on *Ribes americanum* Mill. at Madison, with the observation that the fungus reached full maturity only after overwintering. The last previous collection on this host was made nearly 50 years ago, but in September 1964 at Tower Hill State Park, Iowa Co., leaves of *Ribes americanum*, infected with what appeared to be possibly an immature Ascomycete, were gathered and overwintered out-of-doors at Madison. In May 1965 these were found to bear numerous vinous-purplish synemmata characteristic of *Graphiothecium vinosum*.

**Graphiothecium sp.** developed on leaves of *Lonicera tatarica* L. collected at Madison, October 6, 1964, with the fungus in immature condition, and held out-of-doors until May 1965. The closely gregarious synemmata are amphigenous and deeply seated in the leaf tissue, with a black, bulbous base about 125–150 μ diam. The synemmata proper are approx. 175–200 μ long by 25 μ or more thick, black and compact below, but becoming hyaline and more loosely organized above. The conidia are hyaline, fusoid to subcylindric, about 10–17 x 2.5–4 μ, often produced at right angles to the stalk. Although a late season collection, the fungus appeared to have initiated its development as a parasite. So long as unblighted by frost, Tatarian honeysuckle and similar exotics remain green and active much later in the fall than most native species. At the time of col-
lection the fruiting structures resembled immature pycnidia or perithecia, with no indication of the ultimate synnemmatal development which evidently occurred in the spring of 1965.

*Lonicer a morrowi* Gray observed near Ridgeway, Iowa Co., August 5, 1964, bore on the under surface of the leaves a curious, possibly parasitic, presumed fungus which is snowy white and had developed in narrow lines in the form of closed rings, partial rings, and other less regular serpentine patterns. All leaves on any one branch consistently bore the fungus and, except for it, were very clean-appearing with no evidence whatsoever of the debris one would ordinarily expect had the growth accompanied insect infestation. Although superficial in aspect, the organism is very closely appressed and not readily removed. Microscopically it consists of masses of closely interwoven, non-fruiting, hyaline, very slender, hyphae-like threads, about 1 µ wide, which are only obscurely septate, or perhaps even non-septate. These threads quite regularly ascend the trichomes but appear to be superficial on them.

**Additional Hosts**

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


**Syzygites megalocarpus** Ehr. ex Fr. on *Entoloma* (grayanum Peck?). Dane Co., Madison, September 27. Coll. & det. R. J. Boles.

**Microsphaera alni** (Wallr.) Wint. on *Lonicer a morrowi* Gray. Iowa Co., near Ridgeway, August 5, 1964.


**Leptosphaeria elymi** Atk. on *Elymus canadensis* L. Sauk Co., near Leland, July 15.

**Ceratostomella ulmi** Buisman on slippery elm, *Ulmus rubra* Muhl. E. B. Smalley, Dutch elm disease specialist at the University of Wisconsin, informs me that the disease is now general upon slip-
pery as well as upon American elm in southern Wisconsin, and that he has noted its natural occurrence on *Ulmus pumila* L. in the state, although this species is comparatively resistant.

*Cronartium ribicola* Fisch. II, II on *Ribes diacantha* Pall. (cult.). Dane Co., Madison, September 22.


*Puccinia asteris* Duby on *Aster puniceus* L. Iowa Co., Gov. Dodge State Park, July 14.


*Phylllosticta hispida* Ell. & Dearn. on *Smilax eirrhata* (Engelm.) Wats. Green Co., New Glarus Woods Roadside Park, September 8, 1951. Although an adequate specimen was placed in the herbarium at the time of collection, it was overlooked and not recorded in these notes.

*Phylllosticta monardae* Ell. & Barth. on *Monarda punctata* L. Sauk Co., near Leland, September 11. *P. monardae* is said to be synonymous with *Phylllosticta decidua* Ell. & Kell., but because the description does not fit *P. decidua* as I understand it, on an interim basis I have applied the name *P. monardae* to a species of *Phylllosticta* with non-translucent spots which occurs on *Monarda, Blephilia, Lycopus, Mentha* and *Pycnanthemum* in Wisconsin and which corresponds well with the description.
PHOMA POLYGRAMMA (Fr.) Sacc. var. PLANTAGINIS Sacc. on Plantago rugelii Dcne. Racine Co., Racine, October 30, 1894. Coll. J. J. Davis. This is labeled Phyllachora plantaginis Ell. & Ev. and is presumably a portion of the specimen from which Ellis and Everhart described that species. Except for the fact that the fusoid conidia are slightly longer than in specimens on Plantago lanceolata L., discussed by me in my Notes 27 (Trans. Wis. Acad. Sci. Arts Lett. 50: 159. 1961), the overall aspect is very similar indeed, although in P. rugelii the fungus is on the leaves, whereas in P. lanceolata it is normally confined to the flowering scapes.


SEPTORIA GLYCINES Hemmi on Amphicarpa bracteata (L.) Fern. Dane Co., Madison, August 6, 1964. Hemmi gives the pycnidial diameter as 44–100 μ and the length of spores at 21–52 μ. On Amphicarpa they are about 50–65 μ and 20–40 μ respectively and the lesions are dull brownish, cuneate, about .5–3 cm. long by not more
than 1 cm. wide, usually involving the tips of leaflets. The pycnidia are epiphyllous and gregarious, mostly concentrated along the principal veins.


SEPTORIA MATRICARIAE Hollos on *Anthemis cotula* L. Dane Co., Madison, June 3.

*Sphaceloma Rosarum* (Pass.) Jenkins on *Rosa rugosa* Thunb. (cult.) Dane Co., Madison, October 5.

*Hainesia Lythri* (Desm.) Hoehn. on *Rubus deliciosus* Torr. (cult.) Dane Co., Madison, September 22.


*Colletotrichum Helianthi* J. J. Davis on *Helianthus tuberosus* L. Sauk Co., near Leland, June 16.

*Cylindrosporum Rubi* Ell. & Morg. on *Rubus odoratus* L. (cult.) Dane Co., Madison, October 5.

*Monochaetia Discosioideae* (Ell. & Ev.) Sacc. on *Rosa rugosa* Thunb. (cult.) Dane Co., Madison, October 5. Considerable uncertainty attaches to the nomenclature of these forms, but this is the same entity reported as *M. discosioideae* on native roses in Wisconsin.

*Myriocconium Comitatum* J. J. Davis var. *Salicarium* Davis on *Salix petiolaris* Smith. Ozaukee Co., Cedarburg and Waukesha Co., Big Bend. Both specimens collected by Davis in June 1930, but not reported and overlooked until recently.


Tuberculina persicina (Ditm.) Sacc. on Gymnosporangium juniperi-virginianae Schw. III on Juniperus virginiana L. Dane Co., Madison, Picnic Point, May 21. Coll. & det. J. L. Cunningham. The spore horns have been aborted and replaced by the sporodochia of Tuberculina. The first Wisconsin record on telia of a heteroecious rust.

Additional Species

The fungi mentioned have not been previously reported as occurring in Wisconsin.

Gibberidea abundans (Dobr.) Shear on Prunella vulgaris L. Sauk Co., near Leland, August 18, 1962. In my Notes 29 this was erroneously reported as Linospora brunelliae Ell. & Ev., a species which, so far as I am now aware, has not yet been found in Wisconsin or elsewhere in the Midwest.

Ustilago trebouxii H. & P. Sydow on Panicum virgatum L. Dane Co., Madison, July 7. A large clump of this grass in a garden on the University of Wisconsin Campus was heavily infected. The plant was moved several years ago from a spot in Sauk Co., near Lone Rock, Wis. According to Fischer, U. trebouxii is fairly widespread on various grasses in the western United States, but he does not list P. virgatum as a host. The U. S. D. A. Index of Plant Diseases does mention it (as U. underwoodii Zundel) as occurring on P. virgatum in New York State.

Phyllosticta cystopteridis sp. nov.

Maculis obsuro-brunneis, immarginatis, plerumque in pinnulis totis; pycnidiis sparsis, pallido-brunneis, muris tenuibus translucidisque, subglobosis, indistincte ostiolatis, mensuris varii, ca. (100–)125–150 (–225) μ diam.; conidiis hyalinis, angusto-cylindraceis vel subfusoideis, plerumque biguttulatis, (6–)8–10 (–12) x (1.5–)1.7–2.5 (–3) μ.

Lesions dull brown, immarginate, usually involving entire pin

nules; pycnidia scattered, pallid brownish, thin-walled and translucent, subglobose, obscurely ostiolate, variable in size, approx. (100–)125–150 (–225) μ diam.; conidia hyaline, narrowly cylindric or subfusoid, mostly biguttulate, (6–)8–10 (–12) x (1.5)1.7–2.5 (–3) μ.

A very sizable type specimen was obtained and in a number of mounts made from it no conidia with septa were seen, despite the ratio on length to width. Although few sphaeropsidaceous fungi have been reported on ferns, the writer's experience would indicate that they are not so very uncommon on these hosts.

**Phyllosticta argillacea** Bres. on *Rubus strigosus* Michx. Sauk Co., "Hemlock Draw" near Leland, August 14. Since 1958 nineteen specimens of this fungus have been collected. Twelve are on *R. allegheniensis* Porter, all collected in the Madison School Forest near Verona, Dane Co., and 4 on *R. occidentalis* L., one from Madison, one from Abraham's Woods near Albany, Green Co., and two from Gov. Dodge State Park, Iowa Co. An interesting example of a fungus, first described in 1894 on the cultivated European raspberry, *R. idaeus* L. and of which a number of European exsiccati have been distributed, now apparently reported for the first time from North America, yet widespread in southern Wisconsin for almost a decade on native *Rubus*. (*R. strigosus*, it should be noted, is closely related to *R. idaeus* and by some is considered to be but a variety of it). J. J. Davis in his long collecting career seems not to have found this fungus, nor did the writer prior to 1958. Although the pycnidia are flesh-colored and difficult to discern except by transmitted light, the host lesions are very noticeable and it seems unlikely that the organism could have escaped attention over the years had it been present in any considerable amount.

**Macrophoma farlowiana** (Viala & Sauv.) Tassi on *Vitis aestivalis* Michx. Dane Co., near Verona, September 14, 1964.

**Ascochyta Leonuri** Ell. & Dearn. on *Leonurus cardiaca* L. It appears that various Wisconsin collections on this host which were referred to *Ascochyta nepetae* J. J. Davis are better placed in *A. leonuri* because the conidial dimensions at their upper limit correspond to those of the latter species and are out of the range of *A. nepetae*.

**Stagonospora trifidae** sp. nov.

Maculis nigris, irregularibus et indefinitis, saepe magnis; pycnidii hypophyllis, sparsis vel gregariis, vel confertis in venis primis; flavido-brunneis, muris tenuibus, subglobosis, ca. (125-) 150–175 μ diam., conidiis hyalinis, obtusis, cylindraceis vel subcylindraceis. 3-4-septatis, saepe guttulatis, (20)23–33 (–37) x 7–8 (–10) μ.
Spots black, irregular and indefinite, often large; pycnidia hypophyllous, scattered to gregarious, or crowded on the principal veins, yellowish-brown, thin-walled, subglobose, approx. (125-)150 –175 μ diam.; conidia hyaline, obtuse, cylindric or subcylindric, 3-4-septate, often guttulate, (20-)23–33(-37) x 7–8(-10) μ.


Stagonospora ambrosiae Savile (Mycologia 38: 458. 1946) was on lesions primarily produced by Entyloma compositarum and has narrow conidia 10–33 x 2.5–3.5 μ.

Septoria liquidambaris Cooke & Ell. on Hamamelis virginiana L. Sauk Co., “Hemlock Draw” near Leland, August 31, 1964. On Liquidambar in the specimens that I examined, including N. Amer. Fungi 530, the fungus is hypophyllous, contrary to the statement by Cooke and Ellis that it is epiphyllous. On Hamamelis, however, the fruiting structures are definitely epiphyllous and most, but not all, are Cylindrosporum-like and compressed by the cells of the palisade layer. In Liquidambar the more loosely organized mesophyll tissue allows better pycnidial development. The spores are quite characteristic and very similar on both hosts. Instead of scolecospores, a few of the rather imperfect pycnidia on Hamamelis contain microconidia, about 3 x 1 μ. On Hamamelis the lesions are very striking, with the dark brown spots surrounded by a brilliant salmon-colored halo.

Botrytis byssoides J. C. Walker on Allium cepa (cult.). Racine Co., Racine, 1918. Coll. Walker. This should have been included in the earlier Wisconsin lists since, as described by Walker (Phytopath. 15: 708–713. 1925), it is definitely parasitic on onion bulbs.