

NOTES ON WISCONSIN PARASITIC FUNGI. VIII.

H. C. GREENE

University of Wisconsin, Madison

In the University of Wisconsin Herbarium there is a specimen of ALBUGO CANDIDA (Pers.) O. Ktze. on *Thelypodium wrightii* from Zion Park, Utah, collected June 25, 1926 by E. J. Kraus. Although this is not Wisconsin material it is mentioned here for the sake of a record, since so far as I can determine *T. wrightii* has not been listed elsewhere as a host for this fungus.

Davis in his "Parasitic Fungi of Wisconsin" states that UNCINULA NECATOR (Schw.) Burr. is common on *Vitis vulpina* in Wisconsin. Over a ten-year period I have seen many thousand plants of *V. vulpina*, but have observed U. NECATOR in a single case only. This may have been more abundant in past years, but it is perhaps significant that there is but a single earlier specimen on this host, collected 40 years ago, in the Wisconsin Herbarium, and one in the Davis Herbarium, collected 56 years ago.

Plants of the showy garden subject, *Cleome spinosa*, in a University of Wisconsin greenhouse were lethally blighted by a powdery mildew, but perithecia failed to develop.

The oidial stage of presumed ERYSHIPHE CICHORACEARUM DC. has been found in abundance on *Hieracium longipilum* at Madison. *Hieracium canadense* is regularly thus infected, but mature perithecia seem not to have been collected on *Hieracium* in Wisconsin.

Thompson (Phytopath. 31: 241, 1941) finds a *Mycosphaerella* to be the perfect stage connected with SEPTORIA MUSIVA Peck, cause of the common leaf-spot disease of poplar. This he names MYCOSPHAERELLA POPULORUM. (Davis followed Petrak in considering S. MUSIVA Peck to be a synonym of S. POPULI Desm., and the numerous specimens in the Wisconsin Herbarium are thus filed.)

Demaree and Wilcox (Phytopath. 33: 986, 1943) present evidence to show that the organism causing the common leaf-spot of raspberry, usually supposed to be *SEPTORIA RUBI* West., is identical with *CYLINDROSPORIUM RUBI* Ell. & Morg., and that the latter name must be supplanted by that of the ascigerous stage, *SPHAERULINA RUBI* Demaree & Wilcox. They question the connection of *MYCOSPHAERELLA RUBI* Roark (Roark worked in Wisconsin) with the leaf-spot of *Rubus*. In their artificial inoculations the raspberry leaf-spot fungus could not be carried over to dewberry and blackberry. They suggest the temporary retention of the binomial *SEPTORIA RUBI* for designating the fungus causing the leaf-spot in the *Eubatus* section of *Rubus*.

The ascigerous stage of *ACANTHOSTIGMA OCCIDENTALE* (Ell. & Ev.) Sacc. occurs associated with the conidial stage in a collection on *Artemisia ludoviciana*, made at Madison, June 21, 1944. Previous Wisconsin specimens on this host have had conidia only.

Mature *PLEOSPORA* sp. has been found closely associated and presumably connected with *Alternaria* on small, definitely delimited arid spots on living leaves of squash. The asci are about $65 \times 30\mu$, the ascospores about $25 \times 13-15\mu$. It is questionable, however, that the fungus is parasitic since the spots are of a type that might be caused by insects.

COLEOSPORIUM SOLIDAGINIS (Schw.) Thüm. I occurred in great profusion on needles of young trees of *Pinus resinosa* planted in a nursery in the University of Wisconsin Arboretum at Madison, May 26, 1944. A single small earlier collection on this host was made by Davis from planted specimens in Peninsula State Park, Door Co.

In Davis' "Parasitic Fungi of Wisconsin," p. 43, it is indicated that telia only of *UROMYCES ALOPECURI* Seym. have been found in Wisconsin, but uredia have been collected also as shown by Davis' own specimens on *Alopecurus geniculatus* var. *aristulatus* from Haugen, Barron Co., and Big Bend, Waukesha Co.

In the summer and fall of 1943 *PUCCINIA VIRGATA* Ell. & Ev., previously unreported from Wisconsin, occurred in vast abundance on *Sorghastrum nutans* in the University of Wisconsin Arboretum at Madison. In 1944, on the same plants, not a trace of the rust could be found.

A *Phyllosticta* on leaves of *Syringa vulgaris* from Madison does not meet the specifications of hitherto described *Phyllostictae* on this host. The conidia are like those of *PHYLLOSTICTA*

SYRINGAE West., but the leaf spotting is quite different. In the Madison material very large marginal areas are involved, up to one fourth to half the leaf surface. The type of necrosis is that frequently associated with *Ascochyta*, but microscopic examination of many leaves shows no evidence whatever of septation in any of the conidia. It is possible that the fungus is secondary.

A *Phyllosticta* which may be of the type of *PHYLLOSTICTA DECIDUA* Ell. & Kell. has been found on leaves of *Silphium integrifolium* collected near Eagle, Waukesha Co. The leaves are heavily rusted by *Puccinia silphii* and the epiphyllous pycnidia are restricted to arid, whitish regions above the telial cushions. The hyaline, short-cylindrical conidia are $3-3.5 \times 6-8 \mu$.

Another in the series of indeterminate and dubiously parasitic small-spored *Phyllostictae* on astericolous and solidaginicolous hosts has been observed on large gray spots on leaves of *Aster lucidulus*. The pycnidia are large and very dark, with numerous hyaline, biguttulate conidia about $7 \times 2 \mu$. The spots appear to have been caused, at least partially, by the infestation of insects.

A problem of great importance to those interested in the identification of fungi parasitic on plants has recently been brought rather forcibly to my attention although, as all must who work with these parasites, I have always been aware of its existence. The problem is the old one of how much emphasis should be placed on hosts as bases for establishment of species of plant parasitic fungi.

In the fall of 1944 I collected a species of *Ascochyta* on the leaves of what I identified as a large rayless species of *Senecio*. This is firmly established as an escape on the grounds of a long-abandoned farmhouse near Madison. Examination of the literature showed that Petrak (Ann. Mycol. 22: 167, 1924) described *ASCOCHYTA SENECTIONICOLA* on *Senecio sarracenicus* from central Europe, a species which the Madison specimen matches almost exactly in microscopic characters, both from the printed description and from Petrak's own specimens in the University Herbarium. Although in the Wisconsin material the spots are somewhat smaller and better defined, it was nevertheless placed in the herbarium as *ASCOCHYTA SENECTIONICOLA* Petr. Later in the year, following a more careful check of the host, I discovered that my supposed rayless *Senecio* is the common mint geranium, *Chrysanthemum balsamita* L. var. *tanacetoides* Boiss. In the Gray's

Manual treatment *Chrysanthemum* and *Senecio* are in different tribes, the Anthemideae and Senecioneae respectively, although these tribes are placed next one another.

The question, then, is: should ASCOCHYTA SENECONICOLA, described on *Senecio*, be reported as occurring on the not too closely related *Chrysanthemum*, or should my specimen be described as new, since no similar *Ascochyta* appears to have been described on *Chrysanthemum*? The problem thus posed is perhaps insoluble without cross inoculations between hosts, a thing which is unfortunately often not feasible unless the hosts are of considerable economic importance. In the present case it is probably best to see whether the fungus can be collected again at the same station and, if so, attempt to obtain cultures with which to try infection of *Senecio*. In my experience, so sporadic is the occurrence of most parasites that the chances are at least even that this will not be found again.

An interesting *Ascochyta* on *Solanum dulcamara* was collected in small quantity at Madison, July, 1943. The fungus occurs on numerous transparent spots on the leaf, and parasitism is perhaps doubtful. When gathered, the impression was that it was probably PHYLLOSTICTA DECIDUA Ell. & Kell., although it was noted that the pycnidia did not show the translucency so often characteristic of PH. DECIDUA. However, microscopic examination revealed an *Ascochyta* with small, black, indistinctly ostiolate pycnidia, 60-90 μ diam. The hyaline, uniseptate conidia are 6-10 \times 3.5-4.5 μ . This fungus does not seem to correspond to ASCOCHYTA DULCAMARAE Bubak, PHYLLOSTICTA DULCAMARAE Sacc., or PHYLLOSTICTA PERFORANS Ell. & Ev.

Certain of the Wisconsin specimens of *Septoria* on *Alnus* that have been variously placed under SEPTORIA ALNI Sacc. and SEPTORIA ALNIFOLIA Ell. & Ev. have the pycnidial walls so imperfectly developed it would seem they might better be referred to *Cylindrosporium*. In particular is this true of a specimen collected at Madison in 1943 on *Alnus incana*. On the basis of microscopic morphological characters alone this is a good *Cylindrosporium*, but the type of host lesion, and one's knowledge of bridging forms, suggest its inclusion with the alnicolous *Septorias*.

As in the case of similar material placed in the herbarium by Davis, a specimen of SEPTORIA GEI Rob. & Desm. on radicle leaves of *Geum canadense* from Madison has imperfect pycnidia verging

on acervuli, and the conidia are up to 50μ long. This species seems very close to *Cylindrosporium*.

SEPTORIA DEARNESSII Ell. & Ev. has been found on *Angelica atropurpurea* in 1943 in the University Arboretum at Madison. The only other Wisconsin station for this species is Eagleville, Waukesha Co.

PHLEOSPORA ANEMONES Ell. & Kell. on *Anemone virginiana* from Madison was at first determined as *SEPTORIA CYLINDRICA* Ell. & Ev. The latter species was described in 1900 on *Anemone cylindrica* from Montana, and so similar is the description to that of *PHLEOSPORA ANEMONES* that it appeared that these might be conspecific. No specimen of *SEPTORIA CYLINDRICA* is in the Wisconsin Herbarium, but material of the *Phleospora* was sent to Dr. Linder of the Farlow Herbarium who finds that the two are in no way different and that both correspond to the type of *P. ANEMONES*. The latter name must stand unless this is considered to be a *Septoria*, in which case *S. CYLINDRICA* Ell. & Ev. would be the designation. (J. J. Davis, in his "Parasitic Fungi of Wisconsin," p. 79, gives this the new name of *SEPTORIA PUNICEA* which is untenable, since *S. CYLINDRICA* is the earlier name. Dr. Linder points out that O. Kuntze in 1898 transferred *PHLEOSPORA ANEMONES* to *SEPTORIA ANEMONES* (E. & K.) O. Ktze. This appears to be a later homonym, since Desmazieres applied the same name to another and well-known fungus forty odd years previously.)

An excipulaceous fungus, which perhaps should be assigned to *PATELLINA* Speg., has been found at Madison on *Penthorum sedoides*. The amphigenous, flesh-colored, cup-like fruiting structures are sessile and firmly seated in the host tissue, but project noticeably above the surface. The brown spots are very definite, almost circular, about 5 mm. diam. The cups are 125μ or more in diam., and the long, slender phores, some of which are branched, are about $30-40 \times 1.5\mu$. They are crowded in the cup and tend to curve toward the center. The acrogenous, hyaline conidia are ellipsoid to allantoid, about $5-8 \times 2\mu$, and are produced in great profusion.

An unusual dematiaceous fungus occurs on an undetermined narrow-leaved species of *Carex*, collected at Eagleville, Waukesha Co., August 8, 1943. So far as I have been able to determine this does not correspond in its characters to any previously described genus. The specimen is ample and in excellent condition,

but it seems inadvisable to erect a new genus of parasitic fungi where the host concerned is unknown as to species. However, the following descriptive notes are given as a possible aid to others who may find the same thing and wish data and material for comparison. The specimen will be preserved and available for examination. The fungus is hypophyllous on narrow, more or less elongate, medium brown spots on the living leaves. The gregarious, seriate tufts of conidiophores are produced through the stomata in fascicles which are compact at the base, but in which the individual conidiophores spread widely upwards. The phores are pale brown below, rather deep brown in mass, fading into hyaline toward the tips, usually obscurely once or twice septate, more or less geniculate and tortuous, sometimes once branched near the base, or sometimes with pseudo-branching which is the result of anastomosis between adjacent conidiophores. There are from about 10-20 phores (approx.) in a tuft. The more strongly geniculate phores may have a number of spore scars, and the tips are frequently denticulate with several scars in close proximity. The phores are from $30-80 \times 3-3.5\mu$, mostly about $45 \times 3\mu$. The conidia, by direct lighting of the dried material as collected, with appropriate magnification, are seen to be several-catenulate, and when the conidiophores are denticulate several chains of conidia may be produced simultaneously from near the tip of a single conidiophore. The conidia are continuous, hyaline, globose or broadly ellipsoid or ovoid, from $5-13 \times 4-6\mu$. Those which are globose are of course not more than 6μ diam.

A very interesting species of *Cladosporium* has been found on living leaves of *Acer negundo* at Madison, August 1944. This species is characterized by the presence, free among the conidiophores, of large numbers of germinated conidia which at first, because of their uniformity, were taken to be spores of a *Cercospora* type. (A specimen from the same tree taken a month later corresponds exactly to that collected in August). These germinated spores form structures which measure from about $50-115\mu$ long and are 2- or 3-septate. They are strongly constricted at the septa and the primary, original cell which is itself only rarely septate (as is so frequently the case in *Cladosporium*) runs from about $15-21 \times 9-11\mu$. Examination of these cells as they are borne on the conidiophores before dispersal shows them to be of the same length, but considerably narrower, as one would expect of ungerminated spores. There is often the appearance

of catenulation, although this may be due, in some cases at least, to germination in situ on the conidiophore. The very dark conidiophores are composed of short-cylindric, almost isodiametric cells and are markedly several times geniculate and crooked. They are frequently two to three times branched, at wide angles, and are of stiff and awkward aspect. I do not find a previous report of *Cladosporium* on box elder, and this may be a new species. I shall be pleased to furnish material to any mycologist who will undertake the specific determination of this fungus.

In my opinion *CLADOSPORIUM AROMATICUM* Ell. & Ev. and *CLADOSPORIUM NERVALE* Ell. & Dearn. on *Rhus* are the same thing, and since the former name is the earlier it should be used. One principal supposed difference between the two forms is that in *C. AROMATICUM* the fungus is supposed to be epiphyllous, while in *C. NERVALE* it is, by implication at least, hypophyllous. Recent collections made near Madison on *Rhus glabra* show the fungus to be amphigenous, somewhat diffuse on the upper surface and with a fairly prominent development along the midrib on the lower surface. Differences in conidiophore length do not seem to be of diagnostic importance. *Fungi Columbiani* 2010, supposedly type material of *C. NERVALE*, has no conidiophores over 80μ long, but in the description on the label they are given as $150 \times 6\mu$. Also, the supposed differences in the shape of the conidia appear not to be significant.

CERCOSPORA DULCAMARAE (Peck) Ell. & Ev. on *Solanum dulcamara* (Jour. Myc. 1: 55, 1885) as described has the fruiting forming indefinite, subviolaceous, or greenish-lead-colored patches on the lower surface of the leaf, and also more sparingly so above but without any distinct spots. In an earlier paper (Trans. Wis. Acad. Sci. 32: 79, 1940) I mentioned a collection made at Mazomanie, Wis. in which "the conidiophores are borne on definitely delimited, arid white spots with a wide, blackish-brown border." Two later collections made in successive years at Madison show similar sharply defined spots, but a specimen taken at Madison in 1944 has the effuse type of fruiting, as do two earlier collections made by Davis. On the basis of macroscopic appearance one would immediately conclude that two different fungi are involved, but microscopically the differences are not so apparent. The conidiophores are perhaps somewhat longer and more closely fascicled in the form producing the definite spots; but the conidia are much the same, and Professor

Chupp stated that the Mazomanie specimen was probably best referred to *C. DULCAMARAE*. If the two forms should be constantly found over a long period of years, however, it would seem that at least a varietal distinction might be justified.

In 1944 at Madison, on *Senecio balsamitae*, there was found a *Cercospora* which is borne on very definite small spots, and in which the fruiting, though amphigenous, is chiefly epiphyllous. A specimen was sent to Professor Chupp for determination and it is his opinion that this should be referred to *CERCOSPORA SENE- CIONICOLA* J. J. Davis (Trans. Wis. Acad. Sci. 30: 10, 1937) on the basis of similar microscopic characters, and indeed they do correspond closely. In *C. SENE- CIONICOLA*, as described on *Senecio aureus*, the spots are indeterminate and the fungus hypophyl- lous and effused. It is interesting that Davis found this in the effused condition on *Senecio balsamitae*, as well as on *S. aureus*.

In "Notes on Wisconsin Parasitic Fungi. III" (Trans. Wis. Acad. Sci. 35: 120, 1943) mention is made of an *Alternaria* possibly parasitic on leaves of *Petalostemum candidum*. A similar fungus has recently been observed, this time on definite lesions on green stems of the same host.

In the lists of additional hosts and species not hitherto reported for Wisconsin which follow, all collections, unless other- wise specified, were made at Madison, Dane Co.

ADDITIONAL HOSTS

The fungi listed have not before been reported as occurring on these hosts in Wisconsin.

PERONOSPORA PARASITICA (Pers.) Fr. on *Draba nemorosa*. Marinette Co., Marinette, June 23, 1916. On a phanerogamic specimen collected by the late Charles Goessl. This is presumably the form of *P. PARASITICA* which Gäumann sets apart as *PERONOSPORA DRABAE*.

SPHAEROTHECA HUMULI var. *FULIGINEA* (Schl.) Salm. on *Erigeron canadensis*. October 17, 1944.

MICROSPHAERA ALNI (Wallr.) Wint. on *Lathyrus palustris* var. *myrtifolius*. October 22, 1910. Coll. J. R. Hedde. I do not find any other specimens in the herbarium on this variety of *Lathyrus*, which some authors set aside as a distinct species.

MICROSPHAERA DIFFUSA C. & P. on *Desmodium acuminatum*. (*D. grandiflorum* of Gray's Manual, 7th ed.) October 22, 1910. Coll. J. R. Heddle. Not only new to Wisconsin, but seemingly not reported elsewhere as a host for this fungus.

ERYSIPHE POLYGONI DC. on *Pisum sativum*. Grant Co., Platteville, September 1, 1888. Coll. and det. by S. M. Tracy. This specimen was distributed as one of the Reliquiae Seymourianae. E. POLYGONI is not mentioned in Davis' notes as occurring on cultivated pea in Wisconsin.

If the development of spores on the living host is one of the criteria distinguishing ERYSIPHE CICHORACEARUM DC. from E. GALEOPSISIDIS DC., then a recent (1944) collection on *Scutellaria lateriflora* must be assigned to E. CICHORACEARUM. Davis at one time listed his specimens on this host as E. CICHORACEARUM, but later filed them all as E. GALEOPSISIDIS. Examination of these specimens shows that they too have asci with spores, and they are plainly not overwintered material. For this reason, therefore, the record of E. GALEOPSISIDIS on *Scutellaria lateriflora* in Wisconsin seems to be incorrect.

PUCCINIA CORONATA Cda. II, III on *Agropyron repens*. August 10, 1944. Arthur's Manual lists only Vermont as a host locality for P. CORONATA on quack grass.

PUCCINIA EXTENSICOLA Plowr. II, III on *Carex stellulata* var. *cephalantha*. July 20, 1943.

PUCCINIA CARICIS (Schum.) Schroet. II, III on *Carex stricta*. September 15, 1944.

PHYLLOSTICTA NEBULOSA Sacc. on *Arenaria lateriflora*. Sauk Co., Town of Sumpter, Baxter's Hollow, July 8, 1944. The spores of the specimen on *Arenaria* are somewhat wider than the 2μ of the description, averaging about 2.5μ , as do those of other Wisconsin specimens on *Silene*. As in most of the specimens on *Silene*, the pycnidia are on dead portions of the leaves.

PHYLLOSTICTA DECIDUA Ell. & Kell. on *Geum strictum*. July 30. On *Monarda fistulosa*, July 19. On *Solanum dulcamara*. July 22. All collected in 1943. Although this is doubtfully parasitic, it is included because of previous mention on other hosts in Wisconsin lists.

PHYLLOSTICTA PHASEOLINA Sacc. on *Soja max*. Rock Co. Janesville, July 14, 1944. Coll. E. E. Honey & J. G. Dickson.

ASCOCHYTA GRAMINICOLA Sacc. on *Muhlenbergia foliosa*. October 8, 1944. Seymour does not list *M. foliosa* as a host of this fungus.

SEPTORIA ATROPURPUREA Peck on *Solidago altissima*. September 28, 1944. In this specimen the flexuous sporules are from $60-90 \times 2-2.5\mu$. *Solidago latifolia* is the only other species of *Solidago* reported as bearing *S. ATROPURPUREA* in Wisconsin. The spots on *S. altissima*, paler in the center, are similar to those on *S. latifolia*.

HENDERSONIA TYPHAE Oud. on *Typha angustifolia*. September 8, 1944. Doubtfully parasitic. Davis made an earlier collection on this host species, but did not refer to it as such. A Wisconsin specimen placed in the herbarium as STAGONOSPORA TYPHOIDEARUM (Desm.) Sacc. has deeply olivaceous spores and seems to be *H. TYPHAE* Oud.

RAMULARIA AEQUIVOCA (Ces.) Sacc. on *Ranunculus pennsylvanicus*. July 12, 1944. Not listed by Seymour on this host.

LEPTOTHYRIUM SIMILISPORUM (Ell. & Davis) Davis on *Solidago altissima*. September 1, 1943. Apparently a new host for this fungus, with no reports from Wisconsin or elsewhere.

HELMINTHOSPORIUM SATIVUM Pamm., King & Bakke on *Muhlenbergia foliosa*. October 8, 1944. Numerous single spore cultures were obtained and submitted to Professor J. L. Allison, Associate Pathologist, U. S. D. A., stationed at Madison, who states that these show the cultural growth characteristics of *H. SATIVUM*. Not listed in Seymour on this host.

CERCOSPORA CARICINA Ell. & Dearn on *Carex interior*. July 1, 1944. This is a slender and somewhat depauperate development of what is usually a decidedly more robust species.

CERCOSPORA VARIICOLOR Wint. on *Paeonia officinalis*. September 30, 1944.

CERCOSPORA CORDATAE Chupp & Greene on *Zizia aurea*. Walworth Co., Pickerel Lake, September 19, 1941; Waukesha Co., Eagleville, October 6, 1941, September 3, 1942; Dane Co., Madison, July 2, 1943, June 11, 1944. This species was described on *Zizia cordata* from material collected by J. J. Davis at Racine, Wis. in 1890, and an additional specimen on the same host was collected on the Scuppernong Prairie near Eagle, Waukesha Co. in 1941. On *Zizia aurea*, in some cases, the conidiophores are

longer than the 35μ maximum of the description, running to 50μ or slightly more.

CERCOSPORA BLEPHILIAE Chupp & Greene on *Lycopus uniflorus*. September 1, 1944. Determined by Professor Chupp.

ADDITIONAL SPECIES

The fungi listed have not before been reported as occurring in Wisconsin.

BIFUSELLA FAULLII Darker on *Abies balsamea*. Vilas Co., July 27, 1902. Coll. J. J. Davis. Det. Dr. G. D. Darker. The effused or labyrinthine pycnidia of this species occur together with PHACIDIUM BALSAMEAE J. J. Davis. Dr. Darker states that B. FAULLII is the primary pathogenic agent, and that the Phacidium is secondary.

PUCCINIA MILLEFOLII Fckl. on *Artemisia frigida*. Pepin Co., Stockholm, August 25, 1935. Coll. N. C. Fassett and R. I. Evans. Arthur's Manual lists no station east of North Dakota for this lepto- form.

PHYLLOSTICTA SALICICOLA Thum. on *Salix*. sp. July 13, 1944.

SEPTORIA CARICIS Pass. on *Carex stricta*. July 15, 1944. This appears to be truly parasitic and shows close microscopic correspondence with Sydow's *Mycotheca germanica* No. 2199.

SEPTORIA CARAGANAE P. Henn. on *Caragana arborescens* (cult.). Washburn Co., Spooner, August 14, 1944. Coll. E. E. Honey. On the grounds of the University of Wisconsin Experimental Farm. Apparently not before reported from the United States.

SEPTORIA MENTHAE (Thüm.) Oud. on *Monarda fistulosa*. September 1, 1944. Referred here with some doubt. The pycnidia are most inconspicuous, and detectable only in sections. The sporules are mostly from $40-55 \times 1.5-2\mu$. That S. MENTHICOLA Sacc. & Let. is distinct from S. MENTHAE seems questionable. S. MENTHAE is the earlier name. European material in the Wisconsin Herbarium labeled S. MENTHAE has spores of the dimensions specified for S. MENTHICOLA and there do not seem to be any well-marked differences in the host lesions. (An interesting member of the Staurosporae occurs together with the Septoria on some of the spots. The small, hyaline, 3-radiate conidia are borne on almost obsolete conidiophores which are aggregated in

rudimentary acervuli. This is probably not a parasite.)

HYALOTHYRIDIDIUM CALAMAGROSTIDIS sp. nov.

Maculis amphigenis, ellipsoideis vel fusiformibus, aliquoties confluentibus, supra pallidioribus cum marginibus angustis, fusco-purpureis, .25–1.5 cm. longis; pycnidiiis elementariis, subepidermidibus, dispersis, profunde immersis, amphigenis, globosis, erumpentibus, ostiolatis, 110–135 μ diam., muris cum cellis pallido-brunneis, planis, compressis, fere concoloribus cum proximis cellis hospitibus; conidiophoris non distinctis, sed cellis fertilibus infra in pycnidiiis; conidiis hyalinis, cellis multis, variatis, anguste vel late ellipsoideis, ovatis, vel obovatis, 30–45 \times 16–23 μ , plerumque apiculate, apicibus hyalinis, 3–13 (plerumque 4–6) \times 1.5–2 μ .

Spots amphigenous, ellipsoid or fusiform, sometimes confluent, paler above with a narrow, dark purple border; .25–1.5 cm. long; pycnidia rudimentary, subepidermal, scattered, deeply sunken in the host tissue, amphigenous, globose, erumpent, ostiolate, 110–135 μ diam., wall of pale brown, flattened, compressed cells, almost concolorous with surrounding host cells; conidiophores not differentiated, but sporiferous tissue occupying the lower half of the inner surface of the pycnidium; conidia hyaline, many-celled, variable, narrowly to broadly ellipsoid, ovate, or obovate, 30–45 \times 16–23 μ , usually with a pointed hyaline apiculum 3–13 (mostly 4–6) \times 1.5–2 μ .

On living leaves of *Calamagrostis canadensis*. Madison, Dane Co., Wis., U. S. A., August 18, 1944. Coll. H. C. Greene. The type specimen is deposited in the University of Wisconsin Cryptogamic Herbarium.

The divisions in the conidia have occurred in many planes so that the cells are not generally in even tiers, but are opposite to one another after the fashion of roughly hewn stones cemented in a wall. The individual cells are variable in size and shape, but are often oblong, or rhomboidal, or otherwise angled. Frequently as many as twenty are in view simultaneously on one side of a conidium. So striking, large, and unusual are the conidia that it was at first doubted that the organism was a fungus, but a germination test showed the development of large numbers of rapidly elongating germ tubes, one per cell, so there seems no question of the true fungal nature of *H. CALAMAGROSTIDIS*. This is the hyaline counterpart of *Camarosporium*.

MARSONIA GLOEODES sp. nov.

Acervulis hypophyllis, dispersis, subepidermidibus, immersis, sed cum conidiis in massis erumpentibus, 100–150 μ diam. ca.; conidiophoris curtissimis, prope obsoletis; conidiis hyalinis, cylindraceis, cum septis mediis distinctis, leviter constrictis septis, cum exoperidiis statim fractis, sed constanter affixis, 19–23 \times 6–7 μ .

Acervuli hypophyllous, scattered, subepidermal in origin, sunken in host mesophyll, but producing erumpent masses of conidia, 100–150 μ diam. ca.; conidiophores very short, almost obsolete, not plainly differentiated from non-sporiferous tissue; conidia hyaline, cylindrical, with distinct median septum, slightly constricted at septum, with a soon ruptured, but persistently adherent outer wall or envelope, 19–23 \times 6–7 μ .

On living leaves of *Fraxinus americana*. Madison, Dane Co., Wis., U.S.A. August 4, 1944. Coll. H. C. Greene. The type specimen is deposited in the University of Wisconsin Cryptogamic Herbarium.

The conidia of *M. GLOEODES* are most distinctive, and when first examined seemed to have thickened hyaline caps at their ends, with appendages radiating from the caps. However, more careful and extended observation shows that the supposed appendages are merely ragged, free-hanging portions of the outer envelope which remains more or less firmly attached at both ends of the conidium, producing the appearance of caps on the apices.

When examined under a hand lens this fungus, in its gross appearance, is extremely suggestive of one of the *MARSONIA FRAXINI-SEPTORIA BESSEYI* intergrading series (see Davis, Trans. Wis. Acad. Sci. 21: 289, 1924) and at the time of collection was thought to be such. The conidia are, however, utterly different.

CYLINDROSPORIUM CELTIDIS Earle on *Celtis occidentalis*. August 4, 1944. The specimen on which the description is based occurred on leaves of *Celtis mississippiensis* from Alabama. The spore characters are given as "cylindric or clavate, guttate, at length obscurely several septate, 20–25 \times 3 μ ." The further statement is made that this somewhat closely resembles *CYLINDROSPORIUM ULMICOLUM* Ell. & Ev. which, however, has spores 45–65 \times 4 μ . In the Madison specimen most of the spores are from 30–35 \times 3 μ , with extremes of 22–42 μ being noted. Many of the spores show considerable curvature. They are frequently clavate

and in other particulars the Wisconsin material shows rather close correspondence to the description. (Heald and Wolf described *CYLINDROSPORIUM DEFOLIATUM* on southern hackberry, but this involved large portions of leaves, or entire leaves. The spores are given as $30-42 \times 3\mu$, cylindrical, which is, to be sure, more in the range of my specimen on *C. occidentalis*. Possibly the two are conspecific. If so, *C. CELTIDIS* is the earlier name.)
CLADOSPORIUM LYSIMACHIAE sp. nov.

Amphigenis, effusis, indeterminatis, fuliginis, in foliis caulibusque; conidiophoris plerumque solitariis, sed aliquoties in fasciis (minus quam decem), fusca infra, apicibus pallidobrunneis, erectis, vel aliquoties angulosis et laxis, nonnihil sinusosis, dense denticulatis, continuis vel 1-3-septatis, plerumque, $50-105 \times 5\mu$; conidiis pallido-fuscis, fusoidis-cylindraceis, apiculatis, constanter 1-septatis, leviter angustatis septis, $17-23 \times 5-7\mu$.

Amphigenous in diffuse, indeterminate, blackish-brown patches on leaves and stems; conidiophores usually single, but occasionally in small tufts (less than ten), dark brown below, tip pale brown, erect or sometimes angled and spreading, somewhat sinuate, closely geniculate in the upper half, tip often denticulate, continuous or 1-3-septate, mostly $50-105 \times 5\mu$; conidia pale fuscous, fusoid-cylindrical, definitely apiculate, usually pronouncedly so at one end, regularly 1-septate, slightly constricted at septum, $17-23 \times 5-7\mu$.

On living leaves and stems of *Lysimachia terrestris*. Madison, Dane Co., Wis., U.S.A., August 24, 1943. Coll. H. C. Greene. Similar material on the same host was collected in August 1944 at the same station. Both the type specimen and the later collection have been deposited in the University of Wisconsin Cryptogamic Herbarium.

In thin, appropriately stained sections the scanty internal mycelium appears to be exclusively intraepidermal. The place of origin of the conidiophores seems to bear no relation to the stomatal openings.

It should be pointed out that while many species of *Cladosporium* have been described, most of the earlier descriptions are inadequate, and it is difficult and often impossible to tell whether a species which comes under observation has been previously described. However, it is felt that less confusion is created by providing an adequate description and a new name, than by placing

a newly found form arbitrarily under an old and dubious name to disconcert future investigators. So far as I have been able to determine, only one other species of *Cladosporium* has been described on Primulaceae and that on a genus which does not occur in the New World. It is, furthermore, obviously quite different from the species on *Lysimachia terrestris*.

A specimen of the saprophytic and ineptly named *MACROSPORIUM PARASTICUM* Thüm. has been presented to the Wisconsin Herbarium by Dr. E. E. Honey. In this connection it should perhaps be noted that the allegedly parasitic *MACROSPORIUM PORRI* Ell., likewise on *Allium cepa*, was reported many years ago as occurring in Wisconsin, but was not recorded in Davis' notes.

