

NOTES ON WISCONSIN PARASITIC FUNGI. XX

H. C. GREENE

Department of Botany, University of Wisconsin, Madison

This series of notes is based principally on collections made during the seasons of 1952 and 1953.

ENDOCONIDIOPHORA FAGACEARUM is the name given by T. W. Bretz (Phytopath. 42: 436. 1952) to the sphaeriaceous perfect stage of *Chalara quercina* Henry, the fungus causing oak wilt, widespread in Wisconsin and neighboring states. According to Ainsworth and Bisby, *Endoconidiophora* Münch. is synonymous with *Ophiostoma* Syd.

PHAEOSPHERIA sp. occurs on telia of the microcyclic *Puccinia silphii* Schw. on *Silphium laciniatum*, collected at Arlington, Columbia Co., August 22, 1952. The perithecia simulate the pycnidia of *Darluka filum* in size and general appearance. They are scattered or clustered, somewhat more than globose, about 65μ wide by 80μ high, pseudoparenchymatous, and sooty. The asci are clavate, about $60 \times 15\mu$, while the ascospores are $20 \times 6\mu$, 3 septate, and clear olivaceous. Since this differs materially from *Eudarluka*, said to be the perfect stage of *Darluka filum*, it is supposed there is no connection between the *Phaeosphaeria* and *D. filum*.

METASPHERIA GALIORUM Sacc. has been collected in mature condition on overwintered stems of *Galium aparine* at Madison, May 13, 1953. It seems possible that the fungus initiated its development the preceding season as a parasite. The conspicuously erumpent perithecia appear to have originated subepidermally.

ELSINOE VENETA (Burkh.) Jenkins, the name for the perfect stage of the organism causing cane and leaf blight of *Rubus occidentalis* and *R. allegheniensis* in Wisconsin, was reported in these notes (Trans. Wis. Acad. Sci. 32: 80. 1940) as *E. veneta* (Speg.) Jenkins, since at that time it was not known that "*Gloeosporium*" *venetum* Speg. is not the *Sphaceloma* imperfect stage of the cane blight, as later determined by Jenkins and Shear (Phytopath. 36: 1043. 1946). According to Jenkins and Shear, Ellis and Everhart described the North American organism under the name *Gloeosporium necator*, and the latter authors provide the name *Sphaceloma necator* (E. & E.) Jenkins & Shear for the imperfect stage.

ELSINOE sp. on *Desmodium illinoense*. A mature specimen was collected on the C. & N. W. R. R. right-of-way, south of Ipswich, Lafayette Co. (approx. 3 miles SE of Platteville, Wis.), August 16, 1951. This does not appear to be one of the species which have been treated or distributed by Jenkins and Bitancourt. The stromata are grayish crustose-convolute, moderately elevated, mostly rather small and irregularly rounded or elongate, hypophyllous, asci subglobose, about 15–25 μ diam., rather irregularly dispersed throughout the stroma; ascospores hyaline, cylindrical, approx. 11 x 4 μ , 3 septate, number per ascus uncertain. Immature specimens collected near Delavan, Walworth Co., August 20, 1951, and near Brodhead, Green Co., August 9, 1952, bear what is assumed to be a *Sphaceloma* stage in which, lacking well-defined conidiophores, the conidia are produced in considerable numbers over the surface of the stromata. These conidia are hyaline, one-celled, subcylindric to ovoid, 4–6 x 3–3.5 μ . In my Notes XVII (Trans. Wis. Acad. Sci. 41: 122. 1952) this material was discussed as a questionable *Tuberculina*, for the perfect stage was detected only after later prepared permanent sections were studied.

TAPHRINA HIRATSUKAE Nishida, according to Mix, replaces the name *T. struthiopteridis* Nishida, a synonym, for the fungus on *Pteretis nodulosa* (*Onoclea struthiopteris*) in Wisconsin.

TAPHRINA COMMUNIS (Sadeb.) Giesenh. is the name under which Wisconsin specimens on *Prunus*, formerly listed under *T. mirabilis* (Atk.) Giesenh., are now cited since, according to Mix, the latter name is a synonym.

PHYLLOSTICTA sp. on *Carya cordiformis* from the New Glarus Woods, Green Co., September 4, 1952, is a micro-form with hyaline, rod-shaped conidia 4 x 1 μ , borne in small, black, globose pycnidia about 55–65 μ diam., which are clustered on rather indefinite yellow and brown marginal spots. This does not match any of the early descriptions of *Phyllosticta* on *Carya* that I have seen. It is very likely the precursor of a perfect stage.

PHYLLOSTICTA sp. on shredded, dead areas on leaflets of *Gymnocladus dioica* perhaps developed parasitically, but the lateness of the season makes this questionable. Coll. at Madison, September 27, 1952. The pycnidia are subglobose, approx. 200 μ diam., the conidia hyaline, 6–10 x 3–3.5 μ . Seemingly not *Phyllosticta gymnocladi* Tehon & Daniels.

PHYLLOSTICTA sp. on leaves of *Zizia aptera* at Madison, September 16, 1952, is similar to, but not identical with, an earlier collection made at the same station (Amer. Midl. Nat. 41: 715. 1949). In the current specimen the spots are flat white, angled, tending to be delimited by the venation. The pycnidia are epi-

phylloous, large and prominent, approx. 200–250 μ diam., black, subglobose. The conidia are straight, rigid, rod-shaped, 5–7 x 1.5–2 μ .

CONIOTHYRIUM (?) sp. is possibly parasitic on leaves of *Acer saccharum*, collected at Madison, August 2, 1952. The largely superficial pycnidia are flattened and imperfectly developed below and are epiphyllous on large, irregular, reddish-brown lesions. They are shining black, mostly about 70–100 μ in greatest diam. The conidia are clear gray and short-cylindric, 3–5.5 x 3–3.5 μ .

PHOMA sp. occurs on the green upper stem of a plant of *Anychia (Paronychia) canadensis* collected at Red Rock, Lafayette Co., July 24, 1948. The sooty-black subglobose pycnidia are deeply seated, about 55–75 μ diam. The hyaline conidia are subfusoid, 6–10 x 2.5–3.5 μ . Unquestionably parasitic, but too small a specimen for descriptive purposes. There is no report in Seymour of any fungus on this inconspicuous little host, so that *Septoria anychiaae*, described by me (Amer. Midl. Nat. 48: 52. 1952) would seem to be the only other fungus record.

SPHAEROPSIS FOLICOLA (B. & R.) Sacc., which has been collected several times on leaves of cultivated specimens of *Crataegus* on the University of Wisconsin campus at Madison, appears to have developed in intimate association with aborted aecia of presumed *Gymnosporangium globosum*. Even on leaves where no rust infection is obvious there are small, closely clustered, flask-shaped bodies in the center portions of the *Sphaeropsis* spots, which appear to be immature pycnia. Whether the *Sphaeropsis* was the primary agent in suppressing the rust, or is only weakly parasitic, or perhaps even saprophytic is unclear.

ASCOCHYTA on leaves of *Abutilon theophrasti*, at Madison, August 7, 1952, seems not to be *Ascochyta abutilonis* Hollos. The latter species is said to have conidia 8–9 x 3–4 μ , while in the Madison specimen they are 11–16 x 4–4.5 μ . In other than spore length, however, the current specimen corresponds fairly well with the description. The pycnidia are epiphyllous, single, or few and scattered on sordid whitish to tan spots which are variously rounded.

ASCOCHYTA sp. on *Leonurus cardiaca*, collected near Poynette, Columbia Co., September 3, 1952, is on a dull black orbicular lesion about 1.5 cm. diam. The olivaceous, thin-walled pycnidia are subglobose, about 125–175 μ diam., the hyaline conidia 11–20 x 3.5–5 μ . A specimen on the same host on a similar lesion, from Madison, has pycnidia about 125 μ , and conidia 7–12 x 3–3.5 μ . Both differ from an earlier specimen on *Leonurus* (Trans. Wis. Acad. Sci. 36: 248. 1944) where the angled, subzonate, blackish-

brown spots are 2–3 mm. diam., and none match the description of *Ascochyta leonuri* Ell. & Dearn. with numerous small spots 1–1.5 mm. diam. and conidia 14–17 x 3.5–4 μ .

DARLUCA FILUM (Biv.) Cast. has been found on aborted aecia of *Puccinia extensicola* on *Aster shortii* at a station near Monticello, Green Co., June 10, 1952, adding to a still small, but growing series of this normally uredial parasite on aecia. In this connection, *D. filum* was found on telia of *Puccinia violae* on *Viola eriocarpa* at Poynette, Columbia Co., August 6, 1952.

STAGONOSPORA sp. was collected on leaves of *Scirpus atrovirens* at Madison, June 28, 1952. There seem to be no American records of *Stagonospora* on *Scirpus* and the European species so listed do not match the present specimen. The fungus is epiphyllous on elongate fusoid lesions which are a dull, pale brown with a narrow darker border. The black, globose pycnidia are gregarious to crowded, about 150–175 μ diam. The conidia are large, 35–50 x 8–10 μ , 5–7-septate, hyaline, markedly guttulate, almost straight to moderately curved, usually tapered at both ends. Parasitism is questionable, as the leaves also bear *Xenogloea eriophori* (Bres.) Syd.

STAGONOSPORA sp. occurred on a leaf of *Habenaria flava*, collected near Avoca in Iowa Co., June 26, 1953. The numerous subglobose, sooty-black pycnidia are about 150–175 μ diam., gregarious on elongate, immarginate, reddish-brown spots. The conidia are hyaline, 3–4-septate, variable in shape from curved-obclavate to sublunate, or even vermiform, approx. 20–32 x 3.5–4.5 μ .

STAGONOSPORA sp. on *Asclepias tuberosa*, collected at Madison, August 20, 1952, seems identical with a form on *Acerates lanuginosa*, discussed in my Notes XVI (Amer. Midl. Nat. 48: 745. 1952). The lesions are those of *Stagonospora zonata* J. J. Davis, but the spores, which are 7-septate and about 50 x 9–10 μ , are entirely outside the range of that species. If more examples are found, in view of the characteristic lesions, it would perhaps be advisable to describe this as a large-spored variety of *S. zonata*.

HENDERSONIA MALI Thum. has, according to Hesler (Mycologia 19: 222. 1927), a *Pleospora* perfect stage, as shown by studies of material from blighted apple twigs. However, *H. mali* was described as occurring on living leaves of apple, and the North American Fungi specimen No. 2164 very closely matches the original description, both in lesion and in microscopic characters. Of considerable interest is the fact that in my Notes XVII (Trans. Wis. Acad. Sci. 41: 117. 1952) I described *Mycosphaerella* sp. on apple leaf lesions which are very similar to those in N. A. F. 2164. I was unaware of this resemblance at the time the note was written but, on the basis of it, it seems possible that

Hesler may have been dealing with a different, although similar species of *Hendersonia*, and that the perfect stage of *H. mali* is a species of *Mycosphaerella* rather than a *Pleospora*.

SEPTORIA sp., of questionable parasitism, occurred on leaves of *Napaea dioica* at New Glarus, Green Co., August 9, 1952. The black, epiphyllous pycnidia are gregarious in small clusters on portions of the leaves already brown and dead. The pycnidia are subglobose, thin-walled, about 60–105 μ diam. The spores are hyaline, continuous, acicular, straight or slightly curved, 17–26 x 1.2–1.5 μ . There seems to be no previous report of any *Septoria* on this host.

SEPTORIA sp. occurred in sparse developments on leaves of *Pastinaca sativa* at Madison, June 27, 1952. The few pycnidia are on dull brown, orbicular, rather sharply delimited lesions, about .5–1 cm. diam. The pycnidia are black with a subconical apex, in general outline almost globose, about 80–100 μ diam., with filiform, straight or slightly flexuous spores, about 18–24 x 1 μ . In the field it was thought that this was probably *Phomopsis diachenii* Sacc. which has been found in previous years on somewhat similar lesions. However, there is absolutely no sign of the fusoid *Phoma*-type conidia which are in vast preponderance in the specimens of *P. diachenii*, and a comparison of the scoleospores likewise shows a seeming difference, although in length and thickness they are fairly similar. The pycnidia of *P. diachenii* are much larger than those of the specimen in question. *Septoria pastinacina* Sacc. is reported as occurring on stems of *Pastinaca*, and it seems possible that the Madison collection may be that species, although in *S. pastinacina* the spots are said to be diffuse and indefinite, the pycnidia 120–150 diam. and flattened, the spores filiform, curved or flexuose, 20–30 x .7–1 μ .

SEPTORIA sp. occurred in sparse development on leaves of its external pycnidial characters, and occurring on rather similar lesions on dead and languishing leaves of *Aster pilosus*, was collected at Madison, July 16, 1952. On the same plants other leaves bore *S. astericola* but, so far as microscopic examination has disclosed, the organisms do not occur together on the same leaves, and *S. astericola* would appear to be the more actively parasitic. The unknown has short, relatively thick spores, 13–17 x 2.5–3 μ , subcylindric to subfusoid, straight to moderately curved, and usually with a well-defined median septum, but if multiseptate only indistinctly so. Possibly referable to *Ascochyta*, although the ratio of spore width to length does not favor such a disposition.

ZYTHIA FRAGARIAE Laibach ? occurs on leaves of *Fragaria virginiana*, collected at Madison, August 14, 1952. The large,

brown, conspicuous, zonate lesions are marginal, of orbicular outline, about 1.5–3 cm. diam. The epiphyllous, tan pycnidia are scattered to gregarious, erumpent, subepidermal, rounded above and flattened below, about 165–180 μ wide by 120–130 μ high. There is a very noticeable ring of sordid-whitish, more or less amorphous, perhaps mucilaginous material about the relatively narrow ostiolar aperture. The entire inner pycnidial wall is lined with closely ranked, slender, hyaline conidiophores, mostly about 8–10 x 1.5–2 μ , slightly enlarged below and tapering to a narrow apex. There is a prominent convex cushion of pseudoparenchymatous cells in the lower flattened portion of the pycnidium, and the basal conidiophore layer is arranged over this cushion. The numerous conidia are hyaline and cylindric, 5–6.5 x 1.5–2 μ . Although the pycnidia appear mature, it seems entirely possible that with age they may become darkened, so the assignment to *Zythia* is tentative.

ZYTHIA AURANTIACA (Peck) Sacc., on the basis of many field observations, occurs in Wisconsin in remarkably constant association with and on twigs of *Cornus alternifolia*, but not on any other species of *Cornus*. Seymour lists the fungus only on *C. alternifolia*. In Wisconsin, seemingly without exception, any sizeable shrub of *C. alternifolia* bears the fungus on one or more dead or dying lower twigs.

GLOEOSPORIUM CARPINICOLUM Ell. & Dearn. was described as having minute, rod-shaped conidia 3–4 x 1.5–2 μ . It seems possible that specimens of *Gloeosporium* on *Ostrya virginiana* collected by me near Poynette, Columbia Co., in August 1952 and by J. J. Davis at Lynxville, Crawford Co., in September, 1915, may be identical or related forms. Davis labeled his specimen as a questionable micro-conidial form of *Gloeosporium robergei* Desm., and the lesions produced do seem closer to those characteristic of that species than to those of *G. carpinicolum* as described.

BOTRYTIS sp. appears parasitic on large, orbicular, conspicuous, grayish-brown zonate lesions on leaves of *Thalictrum dasycarpum*, collected at Madison, July 8, 1952. The spots have a dendritic aspect at the outer margin and the whole is surrounded by a wide yellow halo. Contrary to the situation in an earlier specimen of *Botrytis* on this host (Farlowia 1: 577. 1944) there was no previous *Puccinia rubigo-vera* infection.

BOTRYTIS sp., which seems to have developed parasitically, occurred on leaves of *Rubus pubescens* at Madison, July 6, 1952. The fungus is amphigenous, but mostly hypophyllous, on sharply defined orbicular tan spots which range from 2 mm. to about 1 cm. in diam. The unbranched conidiophores are usually few to

a spot. They are dark brown, shining, up to 2–3 mm. long, flexuous, tending to be decumbent, septate, about 18–20 μ wide, and somewhat inflated at the sporiferous apex. The greenish-hyaline conidia are broadly ellipsoid, smooth, 10–12 x 5–6 μ .

CLADOSPORIUM sp. is sometimes observed localized on the principal veins on the under surface of leaves of *Betula papyrifera* where its relation to the host as regards parasitism is uncertain. An especially well-developed specimen was collected at Madison, August 18, 1952. There is a minimal amount of non-fruiting mycelium. The conidiophores are scattered as individuals or in small clusters. They are pale brown, non-septate so far as observed, straight to strongly curved, several times geniculate at tip (which may be more or less strongly denticulate), approx. 35–40 x 4 μ . The conidia, present in surprising profusion, considering the scanty mycelium, are somewhat verrucose, yellowish-gray, often slightly constricted at the septum, catenulate, with truncate scars at each end, 13–19 x 4–6 μ .

CLADOSPORIUM sp., evidently parasitic, occurred on living leaves of *Coreopsis palmata* at Madison, September 2, 1952. The fungus is hypophyllous in effused patches. The conidiophores arise individually, are rather thick-walled, dark brown, moderately curved to tortuous, 2–3-septate, usually constricted at the septa, 35–65 x 4.5–5.5 μ . The tips are simple to once or twice geniculate and are not noticeably paler than the rest of the phore. Only a few conidia were seen. These were subelliptic, pale olivaceous, smooth, 10–12 x 4–5 μ .

RAMULARIA (?) which occurs on small rounded, grayish-brown spots on leaves of *Circaea alpina*, from Parfrey's Glen, Sauk Co., August 24, 1950, is quite similar to the dubious *Ramularia arisaematis* discussed in my Notes X (Amer. Midl. Nat. 39: 447. 1948). The hyaline, cylindrical spores are mostly 1-septate and about 17–20 x 3.5 μ , and seem to be produced in tufts without any recognizable conidiophores. The spots are sharply delimited on otherwise vigorous green leaves.

CERCOSPORA sp. has been observed on leaves of *Digitaria ischaemum*, collected near Suamico, Brown Co., September 14, 1952. There is no distinct spotting and the numerous small fascicles are amphigenous over the entire browned leaf surface. Microscopic notes are as follows: conidiophores pale grayish-brown, non-septate, from straight to moderately curved, simple or once geniculate at tip, 25–35 x 4–4.5 μ , in small fascicles of about 5–8, only slightly spreading, from a dark stromatoid base; conidia slender, mostly almost straight, pale grayish, narrowly obclavate, obscurely 3–5-septate, about 35–55 x 3–3.5 μ . Chupp

states that this is close to, if not identical with *Cercospora fusimaculans* Atk.

EPICOCCUM NEGLECTUM Desm. was reported in my Notes XII (Amer. Midl. Nat. 41: 731. 1949) as a possible weak parasite of soy bean in Wisconsin. Similar material has been collected on hog peanut, *Amphicarpa bracteata*, at Madison, July 1953. The distal portions of otherwise still healthy leaflets consistently bear the fungus on languishing dull green to brownish areas.

ALTERNARIA sp., which may be parasitic, occurs on pycnidia of *Septoria sibirica* Thum. on *Ribes missouriense* from Madison, July 19, 1952. The fungus is strictly confined to the pycnidia which, in turn, are confined to small, sharply delimited, purple-bordered spots. The conidia are muriform, short-clavate, about $40 \times 10\mu$, with a short, obtuse beak. The phores are $65-80 \times 5\mu$, closely 6-8-septate, strongly curved above, non-geniculate, occasionally subtorulose, clear, light, uniform brown.

STYSANUS sp., starting development in the fall of 1952 on living leaves of *Physocarpus opulifolius*, but not coming to maturity until the following spring, has been observed and collected at Madison. It seems possible, but has not been demonstrated, that the spots were caused by *Ramularia spiraeae* Peck and that the *Stysanus* is secondary. The fall of 1952 was the driest in some eighty years in the Madison area, and it may be that the fungus would have come to maturity had moisture conditions been more nearly average. (On some of the spots on the overwintered leaves are what appear to be immature perithecia, so perhaps in a normal year the *Stysanus* would reach maturity in the current season, to be followed by a perfect stage the following spring). The following descriptive notes have been made: On living leaves—spots rounded, dull brown, immarginate, 3-6 mm. diam., closely studded below with the immature coremia which superficially resemble the beaks of rostrate perithecia. On dead, overwintered leaves—coremia hypophyllous, blackish-brown, straight, columnar, composed of closely packed parallel hyphae, approx. $475-600 \times 17-23\mu$, tapering to a moderately enlarged, but not markedly or abruptly swollen base. In shape the fertile heads are from clavate to almost globular, but do not account for more than about $1/10$ to $1/8$ of the overall stalk length. Conidiophores subhyaline, faintly asperulate, about 3μ diam., mostly not over 30μ long at point of departure from stalk, simple or closely geniculate at tip. Conidia catentulate, hyaline, smooth, subfusoid, $6-10 \times 2.5-3\mu$, with rather conspicuous scars. Determination is based on the Saccardian treatment which employs catenulation or lack of it as a primary characteristic in separating the genera of this group. It may be doubted that this is a reliable and con-

stant feature in differentiating *Stysanus* from *Graphium*. Collections of immature material, of mature specimens overwintered in a wire cage, and of mature specimens gathered free under the infected shrubs have been placed in the University of Wisconsin Herbarium.

Spartina pectinata, collected September 21, 1952 near Mazomanie, Dane Co., had remarkably conspicuous, large, orbicular leaf spots, 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 hyaline, thin-walled, septate, and somewhat verrucose. If not parasitic it would seem that there is at least some sort of correlation with the spotting, which occurred throughout a large clone of the host and was noticeable from a distance of many feet. There is nothing to indicate any insect infestation as being responsible for the symptoms.

Fungi which seem essentially superficial, are usually sterile, and ordinarily have dark mycelium bearing sclerotia or sclerotium-like bodies have been collected occasionally in Wisconsin overrunning the leaves of living plants to a degree that, although they are not parasites, they probably are detrimental to the plants bearing them. A notable example is so-called *Sclerotiumyces colchicus* Woron. occurring on many and diverse host substrates. A recent find on leaves of *Solidago nemoralis*, from Madison, July 1952, is of interest. In the field this was assumed to be an extra heavy and profuse growth of *Cladosporium astericola*, often found on species of *Solidago* in Wisconsin. Microscopic examination, however, shows a seemingly superficial *Cicinnobolus*-like fungus with profuse, dark, faintly toruloid mycelium on which are borne clusters of subcylindric, widely open, more less pedicellate pycnidia, in which are hyaline, rod-shaped microconidia. If a powdery mildew is present it has been suppressed to the point where it is not detectable on ordinary inspection.

ADDITIONAL HOSTS

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

PLASMOPARA HALSTEDII (Farl.) Berl. & DeToni on *Cacalia suaveolens*. Dane Co., Madison, July 7, 1953. Seemingly the first report on any species of *Cacalia*.

ELSINOE VENETA (Burkh.) Jenkins on *Rubus allegheniensis*. Lafayette Co., near Platteville, August 16, 1952. On leaves. Det. Jenkins & Bitancourt.

LOPHODERMIIUM JUNIPERINUM (Fr.) DeNot. on *Juniperus chinensis* var. *pfitzeriana* (cult.). Dane Co., Madison, March 15, 1953.

PUCINIA GRAMINIS Pers. II, III on *Arrhenatherum elatius*. Dane Co., Madison, Univ. Wis. Hill Farm, October 21, 1947. Coll. J. G. Dickson.

PUCINIA CORONATA Cda. II on *Lolium multiflorum*. Dane Co., Univ. Wis. Hill Farm, October 21, 1947. Coll. J. G. Dickson.

PUCINIA SCHEDONNARDI Kell. & Sw. II on *Sporobolus asper*. Rock Co., Beloit, June 21, 1953. Coll. R. W. Curtis. Seemingly the first report on *S. asper*, and also the first collection from Wisconsin on any species of *Sporobolus*.

PUCINIA MINUTISSIMA Arth. III on *Carex lasiocarpa*. Wau-paca Co., White Lake at Weyauwega, September 13, 1931. Coll. N. C. Fassett & J. W. Rhodes. On a phanerogamic specimen in the University of Wisconsin Herbarium. Several collections have been made of the aecial stage on *Decodon verticillatus*.

PUCINIA EXTENSICOLA Plowr. I on *Solidago ohioensis*. Jefferson Co., near Lake Mills, June 15, 1953.

UROMYCES ACUMINATUS Arth. I on *Phlox glaberrima*. Kenosha Co., near Kenosha, June 26, 1953. Coll. J. Butler.

UROMYCES HYPERICI (Spreng.) Curt. I on *Hypericum sphaerocarpum*. Rock Co., Beloit, June 14, 1953. Coll. R. W. Curtis.

CINTRACTIA JUNCII (Schw.) Trel. on *Juncus greenei*. Dane Co., Madison, June 24, 1953. Adjacent to a massive infection of plants of *Juncus dudleyi*.

PHYLLOSTICTA MINUTISSIMA Ell. & Ev. on *Acer saccharum*. Sauk Co., Baxter's Hollow, Town of Sumpter, September 1, 1952. Coll. D. H. Hall.

PHYLLOSTICTA DECIDUA Ell. & Kell. on *Boehmeria cylindrica*. Sauk Co., Ferry Bluff, Town of Prairie du Sac, July 11, 1952. Also on *Cicuta maculata*, Dane Co., Madison, July 6, 1952.

CICINOBOLUS CESATI DeBary on *Microsphaera euphoribae* on *Euphorbia preslii*. Dane Co., Madison, September 20, 1952; on *Erysiphe galeopsidis* on *Teucrium canadense* var. *virginicum*. Iowa Co., near Arena, September 21, 1952; on *Microsphaera alni* on *Syringa vulgaris*. Dane Co., Madison, September 25, 1952; on *Sphaerotheca humuli* var. *fuliginea* on *Agastache scrophulariaefolia*. Green Co., New Glarus Woods, August 23, 1949.

DARLUCA FILUM (Biv.) Cast. on *Puccinia angustata* II on *Scirpus cyperinus* var. *pelius*. Green Co., near Monticello, August 5, 1952.

Selenophoma donacis var. *stomaticola* (Bauml.) Spr. & Johns. on *Elymus virginicus*. Dane Co., Belleville, September 13, 1952. Confined to the sheaths where it has produced no distinct spotting.

COLLETOTRICHUM GRAMINICOLA (Ces.) Wils. on *Digitaria ischaemum*. Brown Co., near Suamico, September 14, 1952. Coll. N. V. DeByle.

COLLETOTRICHUM VIOLAE-ROTUNDIFOLIAE (Sacc.) House on *Viola adunca*. Oconto Co., near Sobieski, September 19, 1952. Coll. N. V. DeByle.

CERCOSPORA CYPERICOLA Chupp & Greene on *Cyperus houghtonii*. Douglas Co., Gordon, July 17, 1907. Coll. J. J. Davis. Originally filed as a doubtful specimen of *C. caricina* Ell. & Dearn.

CERCOSPORA JUNCINA Sacc. on *Juncus greenii*. Sauk Co., near Spring Green, August 12, 1952. Det. Chas. Chupp, who informs me that *Cercospora junci* J. J. Davis is a synonym. Also reported from Wisconsin on *J. brachycephalus*, *J. brevicaudatus*, and *J. dudleyi*.

CERCOSPORELLA DEARNESSII Bub. & Sacc. on *Solidago canadensis*, Racine Co., Racine, September 4, 1893. Coll. J. J. Davis. Originally determined as *Cercospora cana* Sacc. from which it seems distinct.

TUBERCULINA PERSICINA (Ditm.) Sacc. on *Puccinia vexans* I on *Acerates viridiflora*. Dane Co., near Sauk City, September 25, 1952.

ADDITIONAL SPECIES

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

SPHAERELLA (MYCOSPHAERELLA) SICYCOLA Ell. & Ev. on *Sicyos angulatus*. Dane Co., Madison, August 30, 1952.

ELSINOE SOLIDAGINIS Jenkins on *Aster linariifolius*. Sauk Co., near Spring Green, August 12, 1952. On stems and leaves. A very interesting find which corresponds well macroscopically with specimens on *Solidago*, and microscopically closely matches Jenkin's description (Jour. Agr. Res. 51: 522. 1935). Most, if not all the specimens naturally occurring on *Solidago* seem to have been taken in Florida, so the Wisconsin collection greatly extends the range. It is of possible significance that the host was growing on almost pure sand, where daytime temperatures are often very high, so that if high temperatures favor this species, the habitat met the requisite condition. The *Sphaceloma* stage has not been seen in the Wisconsin material.

TAPHRINA AMERICANA Mix on *Betula papyrifera*. Douglas Co., Solon Springs, June 14, 1914. Coll. J. J. Davis and originally determined as *Taphrina betulina* Rostr. According to Mix the latter species does not occur in North America.

TAPHRINA ROBINSONIANA Giesenh. on *Alnus rugosa* (*A. incana* of earlier reports). Manitowoc Co., Two Rivers, July 31, 1917. Coll. J. J. Davis. Other collections from Ashland, Burnett, Door, Douglas, Kewaunee, Sauk, Vilas and Washington Cos. Earlier reported as *T. alni-incanae* (Kuehn.) Magn., itself a synonym of *T. amentorum* (Sadeb.) Rostr., which does not occur in the U. S., according to Mix.

TAPHRINA FLAVORUBRA Ray on *Prunus pumila*. Adams Co., Adams, June 22, 1917. Coll. J. J. Davis. Other specimens are from Douglas, Jackson, Manitowoc, Marinette, Portage, Richland, Vilas and Waushara Cos. All originally determined as *T. communis* (Sadeb.) Giesenh., which does not occur on *Prunus pumila*, according to Mix.

TAPHRINA WIESNERI (Rathay) Mix on *Prunus pennsylvanica*. Jackson Co., Millston, June 23, 1916. Coll. J. J. Davis. Other specimens are from Adams, Door, Grant, Green, Manitowoc, Portage, Sauk and Waushara Cos. Earlier reported as *T. insititiae* (Sadeb.) Johans. which is, according to Mix, a synonym of *T. pruni*.

Aecidium avocensis Cummins & Greene sp. nov.

Spermogoniis non visis. Aeciis hypophyllis, ad nervos aggregatis, cupulatis, 0.3–0.5 mm. diam., margine lacerato; aeciosporae globoideae (13–) 15–20 x (13–) 16–21 (–23) μ , membrana hyaline, verrucosa, (2–) 3–3.5 μ cr.

Spermogonia not found, perhaps not formed. Aecia hypophyllous on chlorotic areas, tending to be grouped along the veins, 0.3–0.5 mm. in diam., cupulate, yellowish, opening apically, the peridium becoming lacerate or fragmented, peridial cells highly variable, sometimes simulating the aeciospores, sometimes oblong and attaining 54 μ in length, the inner wall 2–3 μ thick, verrucose, the outer up to 18 thick and transversely striate with usually continuous and discrete ridges; aeciospores mostly globoid, (13–) 15–20 x (13–) 16–21 (–23) μ , wall hyaline or pale yellowish, (2–) 3–3.5 μ thick, verrucose with rounded warts or these sometimes confluent in a labyrinthiform pattern.

On *Callirhoe triangulata* (Leavenw.) Gray, near Avoca, Iowa Co., Wisconsin, U. S. A., June 22, 1951 (TYPE). Coll. H. C. Greene.

Puccinia avocensis Cummins & Greene sp. nov.

Uredii ignotis, verisimiliter nullis. Teliis epiphyllis, pulvinatis, usque ad 1 mm. latis et 2 cm. longis, obscure cinnamomeo-brunneis; teliosporae late ellipsoideae vel ovalibus, utrinque moderate rotundatae, medio non constrictae, (19-) 25-28 (-32) x (32-) 37-44 (-50) μ ; membrana uniformiter pallide castaneo-vel aureo-brunnea, (2-) 3-4 (-5) μ cr., ad apicem non vel vix incrassata; pedicello hyalino, plus minusve 100 μ longo sed valde fragili et deciduo.

Uredia and urediospores not found, probably not formed. Telia epiphyllous (i.e., adaxial), subepidermal but early erumpent, intercostal, loosely pulvinate, linear, attaining 1 mm. in width and 2 cm. in length, dark cinnamon-brown; teliospores broadly ellipsoid or oval, not constricted at the septum, usually moderately rounded apically and basally, (19-) 25-28 (-32) x (32-) 37-44 (-50) μ ; wall uniformly pale chestnut- or golden-brown, smooth, uniformly (2-) 3-4 (-5) μ thick or only slightly thicker at and near the apex, the pore apical in each cell; pedicel hyaline, slender, thin-walled and collapsing laterally throughout, exceeding 100 μ in length, but fragile and always broken near the spore at maturity. One-celled teliospores are common.

On *Stipa spartea* Trin., near Avoca, Iowa Co., Wisconsin, U. S. A., July 30, 1951; August 16, 1951 (TYPE). Coll. H. C. Greene.

If, as indicated by the close association in the field, the aecial and telial stages are related, *P. avocensis* is an additional species of the mallow-*Stipa* complex. The aecia, except for somewhat smaller spores, are like those of *P. interveniens* Bethel, as is also the life cycle, but the teliospores are entirely distinct because of the essentially uniform thickness of the spore wall and the thin-walled and very fragile pedicels. The teliospores are more like those of *P. burnettii* Griff. but differ particularly because of the nature of the pedicel. *P. burnettii* produces aecia on *Eurotia lanata* (Pursh) Moq. and has aeciospores with much thinner walls. The two species cannot be considered as synonymous.

USTILAGO HEUFLERI Fckl. on *Erythronium albidum*. Green Co., near Albany, May 13, 1953. The only other reported collection on *E. albidum* is from Missouri. The others are on *E. americanum* from the eastern U. S. and Canada.

ENTYLOMA LINARIAE Schroet. on *Linaria vulgaris*. Columbia Co., near Poynette, September 21, 1952. Coll. E. P. VanArsdel.

PHYLLOSTICTA DIRCAE Ell. & Dearn. on *Dirca palustris*. Columbia Co., Pine Hollow near Poynette, July 31, 1953. The spores are described as "narrow-ellipsoid, 2-7 μ ". In the Wisconsin

specimen they are 2-3 x 7 μ . In other respects the material in hand corresponds quite closely to the description.

***Phyllosticta succinosa* sp. nov.**

Maculis griseo-brunneis, immarginatis, orbicularibus, 3-6 mm. diam.; pycnidiis sparsis, erumpentibus, amphigenis, plerumque epiphyllis, succineis, muris tenuibus, subglobois, ostiolatis, 75-160 μ diam., plerumque 100 μ ca.; conidiis hyalinis, subcylindraceis, 4-7 x 2.5-3 μ .

Spots grayish-brown, immarginate, orbicular, 3-6 mm. diam.; pycnidia scattered, erumpent, amphigenous, but mostly epiphyllous, amber-colored, thin-walled, subglobose, ostiolate, 75-160 μ diam., mostly about 100 μ ; conidia hyaline, subcylindric, 4-7 x 2.5-3 μ .

On living leaves of *Ribes americanum*. Madison, Dane County, Wisconsin, U. S. A., June 25, 1952.

Some of the spots show a faint zonation, with the pycnidia mostly ranged on the zone lines, and occasional spots have a margin somewhat darker than the center. In my Notes XIII (Amer. Midl. Nat. 41: 742. 1949) reference was made to what seems to be a rather poorly developed specimen of *P. succinosa* which was at that time doubtfully and tentatively filed under *Phyllosticta grossulariae* Sacc. None of the *Phyllostictae* that I have been able to find described on *Ribes* have characters similar to those of *P. succinosa*.

***Phyllosticta corydalis* (Ell. & Davis) comb. nov.**

Septoria corydalis Ell. & Davis. Jour. Mycol. 8: 13. 1902.

As Davis stated in his original note (Trans. Wis. Acad. Sci. 14: 100. 1903) "Hardly a good *Septoria*". As described, and as shown by re-examination of the type specimen, the conidia are approx. 3-5 x 1-2 μ . Very few are as narrow as 1 μ , however. Coll. in Vilas Co., Wis., July 7, 1901, on *Corydalis sempervirens* (*glauca*).

***Phyllosticta entylomicola* sp. nov.**

Maculis albis vel sordidis, marginibus angustis, brunneis, elevatis, orbicularibus vel angulosis, 1-3 mm. diam.; pycnidiis epiphyllis, sparsis vel gregariis, nigris, subglobois, rostellatis, pseudoparenchymaticis, 90-165 μ diam.; conidiophoris tenuibus, hyalinis, brevibus, prope obsolete; conidiis angusto-cylindraceis, hyalinis, 3.5-6 x 1.5 μ .

Spots white or sordid, with narrow, brown, elevated margin, orbicular or angled, 1-3 mm. diam.; pycnidia epiphyllous, scattered or gregarious, black, subglobose, somewhat beaked, pseudo-

parenchymatous, 90–165 μ diam.; conidiophores slender, hyaline, short, almost obsolete; conidia narrow-cylindric, hyaline, 3.5–6 x 1.5 μ .

On living leaves of *Ratibida (Lepachys) pinnata* on lesions which also bear *Entyloma compositarum* Farl. University of Wisconsin Arboretum, Madison, Dane County, Wisconsin, U. S. A., August 27, 1945. Subsequent collections were made at the same station in 1946, 1951, and 1952. A small specimen was also taken near Tiffany, Rock Co., July 17, 1947.

This was originally reported in my Notes XI (Amer. Midl. Nat. 41: 715. 1949) at which time the consistent coincidence of position between smut and *Phyllosticta* was overlooked. The actual relationship of the *Phyllosticta* to host plant and smut remains obscure. It seems unlikely that the two fungi have any very definite connection with one another. The large black pycnidia are very conspicuous and striking on the white spots, on the smallest of which there is often but a single pycnidium and on the largest not more than a half dozen.

SEPTORIA GLADIOLI Pass. on *Gladiolus* sp. (cult.). Dane Co., Cambridge, Summer 1914. Coll. A. C. Burrill. Excellent material, corresponding closely with presumably authentic European specimens. Davis failed to record this.

SEPTORIA CONSOCIA Peck on *Polygala senega*. Jefferson Co., near Waterloo, June 15, 1953. Peck (Bot. Gaz 5: 34. 1880) states "The perithecia tend to grow in groups or clusters. They are associated with a species of *Aecidium*." The current collection is likewise associated with *Aecidium*—*Puccinia andropogonis* Schw. I—and the spores seem intermediate in length between *Septoria polygalae* Peck, reported by Davis on *P. senega* from Wisconsin, and *S. consocia*. It is perhaps doubtful that the two species are really distinct. The crowding and smaller spores of the latter may possibly be due to poor developmental conditions resulting from the presence of the aecia on the same lesions.

VERMICULARIA (COLLETOTRICHUM) COMPACTA C. & E. on petioles of living leaves of *Parthenocissus vitacea*. Racine Co., Burlington, August 11, 1952. Coll. A. O. Paulus. This corresponds very closely with North American Fungi No. 342, issued as this species on stems of *Vitis*.

CYLINDROSPORIUM FRAXINI (E. & K.) Ell. & Ev. on *Fraxinus pennsylvanica* var. *lanceolata*. Dane Co., Madison, September 27, 1952. A strikingly coarse form. Many of the strongly curved spores are well over 100 μ in length, with granular contents and obtuse ends. Although I have not seen an authentic specimen of *Cylindrosporium fraxini*, I am convinced from a comparison of

the description of *Ramularia fraxinea* J. J. Davis with that of *C. fraxini* that the Davis species is a synonym, and certainly not a species of *Ramularia*. Davis placed 18 specimens, all from stations in the Wisconsin River Valley, in the Wisconsin Herbarium as *Ramularia fraxinea*.

BOTRYTIS TULIPAE (Lib.) Hopkins (*B. parasitica* Cav.) on *Tulipa "gesneriana"* and on *T. "suaveolens"*. Dane Co., Madison, May 18, 1953. Appearing parasitic on the leaves.

MACROSPORIUM UREDINIS Ell. & Barth. on *Puccinia graminis* on *Avena sativa*. Dane Co., Madison, July 19, 1953. Only dubiously parasitic in my estimation, but evidently the same thing Ellis and Bartholomew had and considered to be a parasite. According to recent viewpoint this should probably be referred to *Alternaria*.

***Alternaria inconspicuum* sp. nov.**

Maculis nullis; conidiophoris hypophyllis, inconspicuis, sparsis, unis vel paribus, interdum 3 conjunctim, simplicibus vel subgeniculatis cum cicatricibus acervatim prope apicibus, saepe tortuosis nonnihil, subnodulosis interdum, olivaceo-brunneis, apicibus pallidioribus, formis variis, 35-65 x 4-5 μ , 2-4-, plerumque 3-septatis; conidiis 4-cellis, 3-septatis plerumque, interdum muriformibus restricte, fumoso-olivaceis, formis variis nonnihil, plerumque cylindraceis vel brevo-cylindraceis, vel interdum ovoideis vel obovoideis, cellis basibus obconicis, cicatricibus truncatis, 14-22 x 6-8 μ , 6-6.5 μ plerumque, non catenulatis.

Spots none, conidiophores hypophyllous, inconspicuous, scattered, single, or in pairs, occasionally 3 clustered together, simple or subgeniculate with a cluster of spore scars near the tip, often somewhat tortuous, occasionally subnodulose, olivaceous-brown, and paler at tip which is variable in shape, 35-65 x 4-5 μ , 2-4-, mostly 3-septate; conidia mostly 4-celled, 3-septate, occasionally sparingly muriform, sooty-olivaceous, rather variable in shape, usually cylindrical or short-cylindrical, sometimes ovoid or obovoid, the basal cell obconic with truncate spore scar, 14-22 x 6-8 μ , mostly 6-6.5 μ , non-catenulate.

On living leaves of *Fraxinus pennsylvanica* var. *lanceolata*. Madison, Dane County, Wisconsin, U. S. A., September 11, 1952. A collection was also made at Arena, Iowa Co., Wis., Sept. 17, 1952.

Placed in *Alternaria* in line with Wiltshire's emended and expanded conception of the genus (*Trans. Brit. Mycol. Soc.* 18: 156. 1933).¹ If the septation-type of the great majority of the

spores determined placement this would be assigned to *Brachy-
sporium* Sacc., as only a very small percentage of the spores are
muriform. Even in the spores which lack vertical septations
there is considerable diversity in the size and shape of the indi-
vidual cells, resulting from differences in position of the septa
from spore to spore. Many of the infected leaves show a dull
yellowish to purplish discoloration, but it is not spotting in the
usual sense, and does not seem sufficiently well-defined to be
included in the formal description. On the Arena specimen the
leaves of the host, dubiously determined as *F. pennsylvanica* var.
lanceolata, are very hairy on the under surface, and the fungus
has ascended many of the hairs and sporulated on them.

¹E. G. Simmons, in a personal communication, states that he considers the lack
of beaks on the spores to be sufficient reason for not regarding this as a species of
Alternaria, but, after careful consideration, it seems to me that the sum of the
other features favors such a disposition nonetheless.

