A Provisional List of the Species of Septoria in Iowa

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A PROVISIONAL LIST OF THE SPECIES OF SEPTORIA IN IOWA

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INTRODUCTORY

There are over 1,200 species of the genus Septoria, all of them being parasitic. Most of the members of the genus occur on wild hosts, but several of them cause diseases of great importance on cultivated plants.

The earlier investigators have frequently made an unrecorded host the basis of a new species. Moreover, the morphological characters for the separation of various species are so few that great inaccuracies have crept in when investigators have ignored the value of the age of the spores in recording spore measurements. Also, it has been a custom with these investigators that, instead of giving a range of spore length with its two extremes, they have been content with giving an average. As spore length is an important factor in the determination of the species of Septoria, such a practice has tended to create confusion in the literature and has resulted in the making of a large number of species, many of which are undoubtedly synonymous.

It seems evident, therefore, that the genus Septoria is in great need of systematic and morphological study, yet very little has been done in the way of solving this problem. Garman and Stevens (2), realizing this need, have tabulated species of Septoria, recorded in Saccardo's Sylloge Fungorum, in order of length of spores. They hope that such a method of listing species would prove very convenient for study in morphology besides affording means for rapid determination. Beach's (1) work on "Biologic specialization in the genus Septoria" is of interest in that he shows that certain species of Septoria vary considerably in morphological characters under different environmental conditions, and he therefore rightly questions the value of spore and pycnidial measurements in specific descriptions.

The writer has examined critically the species of the genus available from Iowa in the herbarium at Iowa State College, and

1 The writer gratefully acknowledges the suggestions and criticisms of Dr. I. E. Mellus and Dr. J. C. Gilman.

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in some cases the determinations were corrected. In this work attempt has been made to list both the extremes of spore length, together with a representative average. It is hoped that such a method will facilitate the determination of the species.

The species of Septoria in the herbarium of Iowa State College, together with those reported in literature from Iowa, have been brought together in alphabetical order as a means of ready reference. Under each species a brief description has been given, together with host or hosts on which the organism has been reported, the locality and the name of the collector. A host index of the species has been appended.

### SOME SEPTORIA SPECIES AND THEIR DESCRIPTION

*Septoria aceris*, B. & Br.

On *Acer negundo* L. (3)

*Septoria alismatis* Oud.

On *Alisma plantago* L. (4)

*Septoria alliorum* West.

Pycnidia epiphyllous, half immersed, reddish brown, in irregular spots with greenish white center, scattered; conidia cylindrical, flexuous, obtuse at both ends, 24-32 (extremes 12 and 42) \( \times \) 1-1½µ.

On leaves of *Allium porrum* L. E. W. Holway, Decorah, June 4, 1883.

*Septoria ampeliana* B. & C.

Spots reddish, conidia linear, curved, 30-50µ long.

On leaves of *Vitis vinifera* L. H. S. Coe, Ledges Park, Boone, August, 1912.

*Septoria anemones* Desm.

Pycnidia epiphyllous, small, gregarious, in blackish spots, median pale green; conidia 20-24 \( \times \) 1-1½µ, filiform, very slender, flowing out of the apices of pycnidia.

On leaves of *Anemone virginiana* L. E. W. D. Holway, Decorah, July, 5, 1885.

*Septoria argyraea* Sacc.

On *Elaeagnus angustifolia* L. (3)

*Septoria atro-purpurea*Pk.

On *Aster novae-angliae* L. (3)

*Septoria aurea* var. *destruens* Ell. & Ev.

Spots amphigenous, greenish, with black margins; pycnidia 80-100µ diam.; conidia 36-78 \( \times \) 2-2.5µ.


*Septoria besseyi* Peck.

On *Fraxinus* sp. (4)

*Septoria bromi* Sacc.

On *Bromus secalinus* L. (4)

*Septoria brunellae* Ell. & Holw.

Spots dark rust brown, sharply defined with a narrow raised border; pycnidia thickly scattered over the upper surface of the spots, black, slightly
prominent, 100-130µ in diameter; conidia linear-clavate, sub-fuscous, multi-septate, nearly straight 40-75 x 1½-2µ.

On leaves of Prunella vulgaris L. E. W. D. Holway, Decorah, August 3, 1884.

*Septoria caesalpinae* E. & K.
On Caesalpinia atriplicifolia L. (3).

*Septoria campylaneae* (Lev.) Sacc.
Pyenidia hypophyllous, gregarious, innate, finely wrinkled, at first prominent, later depressed, in pallid spots, with poor ostiole; conidia cylindrical, continuous, linear, curved, obtuse at both ends, 18-22 (extremes 18 and 28) x 2-3µ.

On leaves of Campanula americana L. E. W. D. Holway, Decorah, June 22, 1884.

*Septoria cannabina* Pk.
On Cannabis sativa L. (3)

*Septoria celtis-gallae* W. R. Ger.
On Celtis occidentalis L. (3).

*Septoria cerealis* (P. K.) Peck.
Spots scattered or confluent, small, sub-angular, brown or reddish-brown; pyenidia few, collapsing when dry, almost marginate, pale or amber coloured; conidia filiform straight, often curved, 50-75µ long.


*Septoria chrysanthemi* Cav.
On Chrysanthemum (cultivated) (4).

*Septoria cirsii* Niesl.
On Cnicus altissimum (L.) Spreng. (3).

*Septoria conspicua* Ell. & Mart.
Spots amphigenous, rusty-brown, with a narrow slightly raised border, suborbicular, 2-5 mm., or, by confluence, one cm. in diam., thickly scattered over the leaf; pyenidia amphigenous, black, convex, numerous, 100-130µ in diam.; conidia filiform, 36-56 (20 and 60) x 1-1.25µ, guttulate, subhyaline.

On leaves of Steironema quadriflorum (Sims.) Hitchc. George W. Carver, Ames, October 24, 1892.

*Septoria convolvuli* Desm.
Spots orbicular, afterwards confluent, irregular, reddish or rusty-brown, finally with white center; pyenidia innate, small, epiphyllous brown, protruding; conidia, curved, 5-6 guttulate, 40-52 (extremes 18 and 58) x 1.5µ.


*Septoria cornicola* Desm.
Spots grey, rarely round, with dark purple border; pyenidia dark brown, globose depressed, scattered, mostly epiphyllous, 100-110µ in diam.; conidia hyaline, cylindrical, curved, 2-4 septate, 40-56 (lowest extreme 20) x 2-2.5µ, obsolete.

On leaves of Cornus sibirica. I. E. Melhus, Shenandoah, October 10, 1923.

*Septoria cryptotaeniae* Ell. & Rau.
Spots white, thin, irregular, border obsolete; pyenidia epiphyllous, erumpent, sub-globose, blackish brown very delicate 100-120µ in diam.; conidia filiform, hyaline, tinted with green, cylindrical, ends slightly acute, curved, 24-38 (extremes 16 and 42) x 1.5µ faintly guttulate.

*Septoria dianthi* Desm.

On *Dianthus* sp. (4)

*Septoria divaricatae* Ell. & Ev.

Spots whitish, amphigenous, confluent, with purple border; pycnidia numerous, punctiform, epiphyllous, lenticular 100-120 µ dull black; conidia 20-25 (extremes 10 and 38) x 0.75-1 µ, nearly straight instead of flexuous, non-septate, guttulate.

On living leaves of Phlox divaricata L. var. laphamii Wood. E. W. D. Holway, Decorah, June 4, 1883.

*Septoria equiseti* Desm.

On *Equisetum* sp. (4)

*Septoria erigeronitis* Pk.

On *Erigeron ramosus* (Walt.) BSP. (3)

*Septoria eupatoriil* Rob. & Desm.

On *Eupatorium urticaefolium* Reichard. (3)

*Septoria helianthi* Ell. & Kell.

Spots brown, definite, 2.5-7.5 mm. with yellow elevated margin; pycnidia epiphyllous, immersed, brown, collapsing, 105 µ; conidia linear-filiform, 3-5 septate, 44-70 (extremes 30 and 78) x 2-3 µ.

On leaves of *Helianthus tuberosus* L. H. S. Coe, Ledges Park, Boone, August, 1912.

*Septoria irregularis* Peck.

Spots small, angular, often confluent, at first yellowish above, then reddish-brown with a narrow darker border, brown or grayish brown beneath; pycnidia hypophyllous, sometimes amphigenous, irregular, black; conidia numerous, filiform, hyaline 30-45 (extremes 26 and 62) µ long, 0-2 septate.

On living leaves of *Rhus toxicodendron* L. H. S. Coe, Ledges Park, Boone, August, 1912.

*Septoria lacticipola* Ell. & Mart.

Pycnidia punctiform, minute, scattered, brown, in concentric rugose spots, 12-30 mm. diam.; conidia filiform, often curved, 25-30 (extremes 16 and 36) µ long.


On *Lactuca scariola* L. H. S. Coe, Ledges Park, Boone, August, 1912.

*Septoria leptostachyaee* E. & K.

On *Phryma leptostachya* L. (3).

*Septoria lobeliae* Peck.

Spots circular, often confluent, dry, pallid or milk white, with dark- or brown purple margin; pycnidia small, numerous, clustered, black, innate, amphigenous; conidia filiform, simple, 20-28 (extremes 14 and 34) x about 2 µ.


*Septoria lupulina* Ell. & Kell.

Spots pale yellow-white, sub-angular and limited by the veinlets, 2-4 mm. across, subconfluent and occupying the greater part of the leaf; pycnidia scattered, innate but visible through the cuticle on the upper side of
the leaf, appearing of a dark lead (?), colour, sublenticular (150μ), of coarse cellular structure; conidia 30-50 (extremes 20 and 56) x 2-2.5μ curved, a little thicker at one end, obtuse.

On leaves of *Humulus lupulus* L. H. S. Coe, Ledges Park, Boone, August, 1912.

*Septoria lycopersici* Speg.

Spots large, often confluent and covering the entire leaf, sordid dark-cinereous, sub-indeterminate; pycnidia scattered, hypophyllous, lenticular-hemispheric, prominent, black, membranous, olivaceous; conidia elongate, cylindrical, 70-110 x 3.3μ, many-septate, blunt on both ends, thin roundish, hyaline.


*Septoria malvicola* Ell. & Mart.

On *Malva rotundifolia* L. (4)

*Septoria microasperma* Ph.

On *Betula* (3)

*Septoria mimuli* Winter

On *Mimulus ringens* L. (3)

*Septoria nabali* B. & C.

On *Prenanthes racemosa* Michx. (3)

*Septoria nodorum* Berk.

Spots pallid, ochraceous, with darkish girdle, depressed or confluent; pycnidia flattened or elongate, sub-epidermal, at first light brown in colour, later becoming dark brown or black; conidia oblong, cylindrical, straight, obtuse and rounded at the ends, curved or angularly bent, hyaline, 3-septate, guttulate, 20-25 (extremes 18 and 32) x 2-4μ.

On nodes, internodes, and glumes of *Triticum vulgare* L. Collected by R. O. Cromwell; identified by B. N. Uppal.

*Septoria nodorum* Berk. is synonymous with *Septoria glumarum* Pass.

*Septoria nothoceras* Gerard.

Spots roundish or oblong, brown; pycnidia minute, about 70μ in diam. black, aggregated in center of spots, often epiphyllous; conidia filiform, hyaline, sometimes curved, obtuse at both ends, 24-28 x about 1.75μ.


*Septoria oenotherae* Westd.

Spots epiphyllous, roundish, small, at first greenish, later becoming brown, with wine-red girdle; pycnidia black, punctiform, aggregated in the center of spot; conidia filiform, curved, hyaline, minute, many-guttulate. 35-40 (extremes 20 and 44) x 1.5-1.75μ.


*Septoria ostryae* Peck.

Spots small, sub-circular, reddish-brown; pycnidia scattered, situated in the center of the spot, blackish brown; conidia linear, strongly curved, indistinctly septate, hyaline, 40-60μ long.

Septoria pachyspora E. & Holw.

Pycnidia epiphyllous, black, 100-130μ, on snow white, thin, small (1-2 mm.) subangular or nearly round spots surrounded by a broad, purplish shaded border; conidia arcuate-fusiform 4-6-septate, 35-60 x 3μ, with greenish yellow tinge.

On leaves of Zanthoxylum americanum Mill. E. W. D. Holway, Decorah, August 1, 1884.

Septoria passerinii Sacc.

Grayish coloured spots, irregular margin; pycnidia longitudinally seriate or scattered, sub-epidermal, black, smooth, globose to subglobose. ostiole oval to elliptical; conidia cylindrical, straight or slightly curved, rounded at the ends, hyaline, 3- septate, 30-45 (extremes 24 and 48) x 1.7-3μ.

On leaves of Hordeum jubatum L. Collected by R. O. Cromwell; identified by B. N. Uppal.

Septoria pileae Thim.

On Pilea pumila (L.) Gray (3)

Septoria piricola Desm.

On Pyrus malus L. (4)

Septoria platanifolia Cke.

On Platanus occidentalis L. (3)

Septoria podophyllina Peck.

Spots large, indefinite, reddish brown, pycnidia epiphyllous, few, clustered on or near the center of the spot, pallid or blackish slightly prominent, collapsing when dry; conidia filiform, variable in length, straight or slightly curved, 28-40 (extremes 16 and 52) x 1.5μ.

On leaves of Podophyllum peltatum L. E. W. D. Holway, Decorah, July 4, 1885.

Septoria polygonorum Desm.

Epiphyllous; spots small, circular, with purple margins; pycnidia innate, minute, dark-pallid, with a wide circular opening, afterwards concave; conidia filiform smooth, flexuous, 4-5 guttulate, hyaline, 40-60 (extremes 28 and 64) x 1μ.


On leaves of Polygonum persicaria L. H. S. Coe, Ledges Park, August, 1912.

Septoria pyri Cast.

On Pyrus malus L. and Pyrus coronaria L. (3)

Septoria querceti Thuem.

On Quercus sp. (4)

Septoria raphontici Thuem.

On Rheum raphonticum L. (3)

Septoria rhoina B. & C.

Spots somewhat whitish, margins broad and black girdled; pycnidia central; conidia vermicular, 48-64 (extremes 32 and 80μ) long, flexuous, hyaline.


Septoria ribis Desm.

Hypophyllous; spots small, irregular, bounded by the leaf veins, purplish
brown; pycnidia innate, minute, convex, blackish brown; cirri in mass black; conidia elongate, linear, curved, guttulate, 40-50 (extremes 18 and 56) μ long.


*Septoria rubi* West.

Spots circular, reddish brown, later with white center and purple margin; pycnidia epiphyllous, dark-brown, depressed, few; conidia filiform, 40-55 (extremes 36 and 58) x 1.5μ, faintly guttulate, indistinctly 2-3-many-septate, hyaline.

On leaves of *Rubus allegheniensis* Porter. H. S. Coe, Ledges Park, Boone, August, 1912.


On leaves of *Rubus canadensis* L. Raymond, Ames, 1891.

*Septoria rudbeckiae* Ellis and Halsted.

On leaves of *Rudbeckia triloba* L. and *R. laciniata* L. (3), Iowa, August, 1887.

*Septoria sambucina* Pk.

On *Sambucus racemosa* L. (3)

*Septoria scrophulariae* Peck.

Spots small, parched, white, with purplish brown margin; pycnidia few, superficial; conidia filiform, curved, hyaline 30-44 (extremes 16 and 64) μ long.

On leaves of *Scrophularia nodosa* L. C. M. King, Ames Fall 1910. L. H. Pammel, Muscatine, August, 1899.


*Septoria sicilyi* Pk.

On *Echinocystis lobata* (Michx.) T. & G. (3).

*Septoria silenes* West.

Spots round confluent, pallid brown, wide; pycnidia minute, black, semi-immersed; conidia cylindrical, 30-44 (lowest extreme 17) x 2.5μ.

On leaves of *Silene antirrhina* L. F. U. Faurot and A. E. Paddock, Ontario, May 28, 1900 and 1901.

*Septoria silenica* Ell. & Martin.

Spots small, light yellow; pycnidia brownish-yellow, soft, innate, scattered, 50μ in diam.; conidia yellowish, cylindrical curved, 3-septate, 36-48 x 3μ.


*Septoria smilacina* Dur. & Mont.

Hypophyllous; spots white with brown regular margins; pycnidia immersed, prominent, ovoid, scattered in great number; conidia rod-like, straight, hyaline, obtuse, 20-40 x 2.7-6μ, nucleolate, later 4 septate.

On leaves of *Smilax herbacea* L. R. Combs, Ames, July 18, 1894.

*Septoria smilacinae* Ell. & Mart.
On *Smilacina racemosa* (L.) Desf. (4)

*Septoria solidaginis* Thuem.

On *Solidago canadensis* L. (3).

*Septoria speculariae* B. & C.

Spots faintly pale; pycnidia prominent, scattered; conidia hyaline, filiform, not straight (slightly curved), 28-40 (extremes 12 and 45) x 1.25-2µ.


*Septoria sphaerelloides* E. & K.

On *Hypericum mutilum* L. (3).

*Septoria stachydis* Rob. & Desm.

Spots amphigenous, subolivaceous, later becoming pallid brown, quite dry, irregular, bounded by veins, scattered or confluent; pycnidia epiphyllous, minute, blackish-brown; conidia rod-like, curved or flexuous, subcontinuous, hyaline, 30-40 (extremes 22 and 48) x 1.7-2µ.

On leaves of *Stachys palustris* L. Geo. VI/. Carver Ames, September 8, 1892.

*Septoria symphoricarpi* Ell. & Ever.

Spots subcircular, small (1-2 mm.), white with a brown border; pycnidia sub-lenticular, black, epiphyllous, few (1-5), prominent; conidia subcylindrical a little narrowed below, nearly straight, 30-45 (extremes 25 and 56) x 2µ faintly 1-3-septate. The white spots are often included in larger irregularly-shaped rusty-brown spots and areas of the leaf, but the pycnidia are confined to white spots. Besides the large brown spots, the leaves are thickly spotted with smaller (1-2 mm.) brown spots.

On leaves of *Symphoricarpos occidentalis* Hook. A. L. Bakke, Forest City, 1908.

*Septoria toxicodendri* Curt.

On *Rhus toxicodendron* L. (3).

*Septoria tritici* Desm.

Amphigenous; spots sub-linear, longitudinal, whitish; pycnidia sub-epidermal, globose to sub-globose, in rows parallel to the vascular strands, brown to black, ostiole circular to oval; conidia slender, cylindrical, straight or slightly curved, hyaline, 3-7-septate, ends rounded 40-70 (extremes 18 and 78) x 1.75-2.7µ.

On *Triticum vulgare* L. C. M. King, Ames, 1908.

The length of summer conidia differs that of conidia collected in winter. (8).

*Septoria ulmi* Fr.

On *Ulmus fulva* Michx. (4).

*Septoria urticae* Desm. & Rob.

Spots amphigenous, ochraceous, orbicular or irregular; pycnidia epiphyllous, minute, numerous, dark; conidia elongate, curved or flexuous, faintly guttulate, 40-50 x 2µ, hyaline.

On leaves of *Urtica gracilis* Ait. H. S. Coe, Ledges Park, Boone, August, 1912.

*Septoria verbenae* Rob. & Desm.

Spots suborbicular, determinate, white with purplish-violaceous margin; pycnidia small, 80-100µ in diam., fuliginous (sooty); conidia cylindrical, straight or flexuous, 40-50 (extremes 26 and 80) µ long, hyaline.
On leaves of *Verbena hastata* L. H. S. Coe, ledges Park, Boone, August, 1912.

*Septoria veronicae* Desm.
On *Veronica virginica* L. (3).

*Septoria virgaureae* Desm.
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