

OHIO

Agricultural Experiment Station.

BULLETIN 44.

COLUMBUS, OHIO, SEPTEMBER, 1892.

A PRELIMINARY LIST OF THE RUSTS OF OHIO.
WILD LETTUCE—A PESTIFEROUS WEED.
WHEAT SCAB.

Offices and Experiment Grounds on the Farm of the Ohio State University.

The Bulletin of this Station is sent free to all residents of the State who request it. Persons who receive duplicate copies of the Bulletin, or who do not care to receive any, are requested to notify the Station, as the edition is not sufficient to supply the urgent demand for it.

All correspondence should be addressed to EXPERIMENT STATION, Columbus, Ohio.

COLUMBUS ·
THE WESTBOTE COMPANY, STATE PRINTERS.
1892.

ORGANIZATION
OF THE
OHIO AGRICULTURAL EXPERIMENT STATION.

BOARD OF CONTROL

SETH H. ELLIS,	Springboro.
HON. JOSEPH H. BRIGHAM,	Delta.
R. H. WARDER,	North Bend.
THE GOVERNOR OF THE STATE,	} . . . <i>Ex-Officio.</i>
THE DIRECTOR OF THE STATION,	

OFFICERS OF THE BOARD.

SETH H. ELLIS,	President.
PROF. WILLIAM R. LAZENBY,	Secretary.
BERTHA E. WILDMAN,	Treasurer.

STATION STAFF.

CHARLES E. THORNE,	Director.
WILLIAM J. GREEN,	Horticulturist and Vice-Director.
J. FREMONT HICKMAN, M. A. S.,	Agriculturist.
FRANCIS M. WEBSTER,	Entomologist.
BERTHA E. WILDMAN,	Bursar.
FREDA DETMERS, M. Sc.,	Botanist.
EDWIN C. GREEN,	Assistant Horticulturist.
F. J. FALKENBACH,	Chemist.

BULLETIN

OF THE

OHIO AGRICULTURAL EXPERIMENT STATION.

VOL. V, No 7.
Whole Number 44

SECOND SERIES.

SEPTEMBER, 1892.

A PRELIMINARY LIST OF THE RUSTS OF OHIO.

BY FRED A. DETMERS.

The Rusts or Uredineæ are a most important order of Parasitic Fungi, viewed from an economic standpoint; for they include some of our worst enemies in the forest, grain-field, meadow, orchard and garden. I have therefore deemed it advisable to give here a list of the rusts collected by the Experiment Station during the past few years. The list is far from complete, but we hope to continue the work until a specimen of every rust which can be found in the State shall have a place in the Experiment Station herbarium.

In the following list are given the name of the rust, the name of the plant on which it is found, the locality in and the time at which it has been collected, together with occasional notes.

UROMYCES CALADII, (Schw.) Farl. *Æcidia* with spermagonia on *Arisænia triphyllum* (Indian Turnip), Columbus, Franklin Co., May, 1889, May 27, 1891; Catawba Island, May 16, 1890; Sugar Grove, Fairfield Co., May 21, May 25, 1891. On *A. draconium* (Green Dragon), State University grounds, Columbus, June, 1889, May 28, 1891; Sellsville, Franklin Co., June 7, 1891; Neil's Run, Columbus, June 9, 1891; in rich, dense woods east of Toledo, August 11, 1877.

The *Æcidia* are thickly spread over the lower surface of the leaves, and when not covering the whole surface they extend in radiating lines along the veins. They occur on the stalk, spadix and both surfaces of the spathe. The affected plants are shrunk and yellow and are easily distinguished.

U. EUPHORBIÆ, C. P. Uredo and teleutospore forms on *Euphorbia procumbens* (Spurge), Columbus, Franklin Co., August 15, 1891. On *E. comutata* (Spurge), Marble Cliff, near Columbus, May 30, 1889. *E. prestii* (Spurge), O. S. University campus, Columbus, August 15, 1890, August 14, 1891.

U. HEDYSARI-PANICULATI, (Schw.) Farl. Uredo and teleutospore forms on *Desm. dium canescens* (Tick-Trefoil), Olentangy river, Columbus, Oct., 1888.

U. HOWEI, Peck. Uredo and teleutospore forms on *A. clepias cornuti* (Milk weed), N. Columbus Run, Oct., 1888, Sept. 14, 1889; Columbus, Oct., 1888, Sept. 24, 27, 1890; Central College, Oct. 4, 1890. On *A. incarnata* (Swamp Milk-weed), Columbus, summer, 1889.

U. LESPEDEZÆ, (Schw.) Peck. On leaves of *Lespedeza violacea* (Bush-Clover), Sugar Grove, Fairfield Co., 1890; Central College, August, 1890. On *L. hirta* (Bush-Clover), Painesville, Lake Co., August, 1887; Sugar Grove, 1890. On *L. procumbens*, Westerville, Franklin Co., fall of 1890. On *L. reticulata*, Central College, Franklin Co., Sept. 4, 1889. On *L. stuezi*, Central College, Franklin Co., Sept. 4, 1889.

U. POLYONI, Pers. On *Polygonum aviculare* (Knotweed), Sellsville, Franklin Co., Nov. 5, 1890. On *P. erectum* (Knotweed), University campus, Columbus, August 14, 1891. Reported to be rare.

U. TRIFOLII, Alb. and Schw. On *Trifolium pratense* (Red Clover), Columbus, 1888, Nov., 1890; Rock Mills, Fairfield Co., Nov., 1891. On *T. repens* (White Clover), Sellsville, Franklin Co., Sept. 5, 1890; University grounds, Columbus, 1890.

PUCCINEA AUGUSTATA, Pk. On leaves of *Scirpus fluviatilis* (?) (River Club-Rush), Columbus, Nov., 1891.

P. CIRCÆÆ, Pers. On *Circœa Luteiana*, Hocking Co., May 24, 1891. The spore beds are light chocolate brown, in little, thick, wart-like clusters over the leaf.

P. CONVOLVULI, Cast. On *Convolvulus sepium* (Hedge Bindweed), Columbus, Nov. 1, 1890.

The teleutosori are scattered irregularly over the leaf. They are elongated and confluent on the veins, petioles and stems; the latter are somewhat swollen. The spores are long covered by the epidermis, giving the fungus a silvery gray appearance.

P. EMACULATA, Schw. On *Panicum capillare* (Old-Witch Grass), Columbus, Sept. 16, 1890. On unnamed grass, Worthington woods, Franklin Co., Oct. 17, 1890.

P. FLOSCULOSORUM, (Alb. and Schw.) Roehl. On *Taraxacum officina e* (Dandelion), Experiment Station lawn, Columbus, Oct. 29, 1890, Aug.

20, 1891; Georgesville, Franklin Co., Nov. 15, 1890, May 7, 1892. On *Cnicus* sp. (Thistle), University grounds, Columbus, Nov. 19, 1890

This a very common Rust, being especially abundant on the Dandelion. In favorable seasons it has been reported on this host during nine months in the year. I have not found it this season on the Thistle. The affected Dandelion leaves are red and the fungus appears in tiny black or brown spots all over the surface.

P. GALIURUM, Lk. On *Galium aparine* (Cleavers Goose-Grass), Sellsville, Franklin Co., June 7, 1891. On *Galium* sp., Fairfield Co., 1882; Rock Mills, Fairfield Co., Nov. 1, 1891.

There are no definite spots, but the affected leaves are yellow.

P. GRAMINIS, Pers The first or æcidial stage was found on *Berberis vulgaris* (Barberry), near Insane Asylum, Columbus, May 15, 1891; Ash-tabula Co., May 27, 1890; University Campus, Columbus, July 22, 1888; Fair grounds, Columbus, May, 1892 The red and black rust was found every year on the oats on the Experiment Station farm. Last year, 1891, the oats was badly rusted; but as smut was also very abundant it is impossible to estimate the amount of damage done by the rust. Wheat was not nearly so badly rusted as the oats. The red rust or uredospores, continued to develop until harvest. The winter stage, or black rust, was not so abundant. In the fall, wheat was sown in the field in which was the badly rusted oats of the past summer. On November 8, 1891, a single ripe uredosorus was found on the young wheat. The spores in this sorus showed, however, more of the characteristics of *P. rubigo-vera* (which occurred on the wheat in the next field during the summer), than of *P. graminis*, notwithstanding the fact that the oats in this field was so badly rusted with *P. graminis*, and some of the oats stubble with empty teleutosori of *P. graminis*, was found at this time in the field. This year, however, the rust does not seem so abundant on either oats or wheat.

One spring as early as April 8, I found ripe uredosori on wheat; and as this is at least a month before the æcidial stage fully matures on the Barberry, and as there were no Barberry bushes near the field, it seems that the mycelium must have passed the winter in the young wheat plant.

P. MARIE-WILSONII? On *Claytonia Virginica* (Spring Beauty), Georgesville, Franklin Co., May 7, 1892. The æcidial and the teleutospore forms were found on the same plant. The teleutosori are described as hypogenous, but on these specimens they occur on both sides of the leaf and also on the calyx.

P. MAYDIS, Carradori. On *Zea Mays* (Corn), Columbus, 1888 and 1891. None reported for 1889 and 1890; Wayne Co., Sept. 1891.

P. MENTHÆ, Pers. On *Blephila hirsuta*, woods west of Insane Asylum,

Columbus, April 18, 1891; "Wyandot Grove," Franklin Co., April 24, 1891; Sellsville, Franklin Co., June 7, 1891; Georgesville, Franklin Co., May 7, 1892. *Mentha viridis* (Spear-mint), Alum Creek, Columbus, Nov. 1890. *M. Canadensis*, (Wild Mint), Sellsville, Franklin Co., Nov. 5, 1890. *Monarda fistulosa* (Wild Bergamot), Alum Creek, Columbus, Nov. 1890. *Pycnanthemum incanum* (Mountain Mint, Basil), Sugar Grove, Fairfield Co., Oct. 15, 16, 1890; May 23, 1891. *Cunila Mariana* (Common Dittany), Sugar Grove, Fairfield Co., May 23, 1891.

P. PIMPINELLÆ, (Strauss) Lk. On *Chærophyllum procumbens*, Olen-tangy river, Columbus, May 21, 1891. The leaves are completely covered with the sori of the fungus.

P. PODOPHYLLI, Schw. On *Podophyllum peltatum* (May Apple), Co-lumbus, May, 1889; Gypsum, Ottawa Co., June 4, 1890; woods north of Columbus, May 15, 1891; Sugar Grove, Fairfield Co., May 21, 1891; May 4, 1892; Georgesville, Franklin Co., May 7, 1892.

The æcidial stage is very conspicuous; it forms large, orange-yellow areas on the lower surface of the leaf, frequently covering almost the entire surface. A diseased leaf is easily recognized by these yellow patches, and by the thickened, sickly appearance of the leaf. The teleutospore stage is not nearly so abundant as the æcidial stage. The teleutosori occur on the stem as well as on the leaf. They were first noticed in the spring of 1891, on the stems just above the ground. When on the leaf with the æcidia, they are more numerous on the upper surface among the sperma-gonia; they also occur on the leaf veins.

P. RUBIGO-VERA, (D. C.) Wint. On wheat at the Ohio Experiment Station. The red rust was produced all summer. The black rust was rather rare and very inconspicuous.

P. SAXIFRAGÆ, Schlecht. On *Saxifraga Virginiensis* (Early Saxifraga), Sugar Grove, Fairfield Co., May, 1891. Rare.

P. TANACETI, D. C. On *Helianthus annuus* (Sunflower), Columbus, Oct. 27, 1890.

P. TIARRELLE, B. and C. On *Mitella diphylla* (Mitrewort, Bishop's Cap), Sugar Grove, Fairfield Co., May 21, 1891. The rust occurs on all parts of the plant; it is more numerous on the lower than the upper sur-face of the leaves.

P. VIOLÆ, D. C. On *Viola Canadensis* (White Violet), Sugar Grove, Fairfield Co., May 9, 1891; rare. *V. palmata*, var. *cucullata*, (Common Blue Violet), Sugar Grove, Fairfield Co., May 8, 1891; woods northwest of Columbus, May 14, 1891; Sugar Grove, Fairfield Co., March 4, 1892. *V. Palmata*, (Blue Violet), Sugar Grove, Fairfield Co., May 8, 1891; rare; *V. pubescens* (Yellow Violet), Sugar Grove, Fairfield Co., but a single plant was found; Georgesville, Franklin Co., May 7, 1892; not abundant. *V.*

rostrata (Pale Violet), Sugar Grove, Fairfield Co., May 4, 8, 1891; very abundant. *V. blanda* (Sweet White Violet), Sugar Grove, Fairfield Co., May 8, 21, 1891; abundant.

These specimens differ from the æcidial stage of *Puccinæ violæ* described by Professor Burrill*, in having spermagonia, and from *Æcidium Marie-Wilsonii* in occurring on thickened spots. To quote from the description of the last named species, "This seems to differ from *Æ. violæ* in the leaf spots not being thickened, in the æcidia and spores, and in the presence of spermagonia." Prof. Plowright† gives *Æcidium violæ* as a synonym of *Puccinea violæ*. The affected stems are much distorted.

P. XANTHII, Schw. On *Xanthium Canadensis* (Cocklebur), Columbus, Sept. 27, 1890; Sugar Grove, Fairfield Co., Sept. 20, 1890.

The fungus forms spots, brown with a lighter margin, scattered irregularly over the large, coarse leaf.

PHRAGMIDIUM FRAGARÆ, (D. C.), Rosm. On the leaves of *Potentilla Canadensis* (Common Cinque-foil or Five-Finger), Columbus, Oct. 3, 1890, April, 1891; Sugar Grove, Fairfield Co., May 16, 1891; Lancaster, June 20, 1879; roadside near Westerville, Franklin Co., May, 1892.

PH. MUCRONATUM. On *Rosa*, Central College, May, 1892. The æcidial stage was found in abundance.

GYMNOSPORANGIUM MACROPUS, Lk. On *Juniperus Virginiana* (Red Cedar), Georgesville, Franklin Co., Nov., 1890; Geauga Co., May 29, 1891; Catawba Island, June, 1891; Rock Mills, Fairfield Co., Nov. 2, 1891.

Dr. Roland Thaxter (Bot. Gazette, Vol. XIV, No. 7, July, 1889, pp. 633-672), obtained *Ræstelia pyrata*, the apple rust, from sowings of *G. macropus* upon the apple.

MELAMPORA POPULINA, Wint. On *Populus monilifera*, Columbus, Oct., 1888, Aug. 27, 1890. *P. grandidentata*, Insane Asylum grounds, Columbus, on old last year's leaves, April, 1891.

COLEOSPORIUM SONCHI-ARVENSIS, Lev. On *Solidago Canadensis* (Golden-rod), Columbus, Sept. 24, 1890. *Vernonia fasciculata* (Iron weed), Columbus, 1889.

CÆOMA NITENS, Schw. Spermagonia reported on Blackberry at Fair grounds, Columbus, May 2, 1891. On *Rubus occidentalis* (Raspberry), Columbus, May 20, 1889. *R. villosus* (Common or High Blackberry), Columbus, July, 1889, spring of 1890; Sugar Grove, Fairfield Co., May 16, 21, 1891; Rock Mills, Fairfield Co., Nov. 1, 1891. *R. Canadensis* (Dewberry), Sugar Grove, Fairfield Co., May 16, 21, 1891. Raspberry (cult.), Smith's Prolific, Experiment Station garden, Columbus, 1891-'92. Blackberry (cult.), Grove City, Franklin Co., July 16, 1891.

* Bull. Ill. St. Lab. Nat. Hist., Vol. II, Art. III, Parasitic Fungi of Ill., Part I.

† British Uredinæ and Ustiliginæ.

The sori of *Czoma nitens* on *R. villosus* collected at Rock Mills, Fairfield Co., Nov. 1, 1891, contained uredo as well as æcidia spores. These uredospores are of a bright yellow color, obovate or pear shaped; episporium thin, minutely echinulate; 22-32 6×16 -22 micromillemeter. Each spore is borne on a hyaline pedicel, about the length of or longer than the spore. These spores are much larger than the uredospores of either *Phragmidium rubi*, or *Ph. rubi-idxi*, the measurements of which, according to Prof. Burrill, are 12-15 \times 15-20 micromillemeter for the former, and 15-18 micromillemeter for the latter. The sori occur on the under surface of the leaf and are pale yellow.

These blackberry canes grew on the southern slope of a hill in a very sheltered situation; the branches of a large fallen chestnut tree formed a roof over them. Many of the canes bore thick clusters of buds and several were in full bloom Nov. 1.

This fungus is said to kill its host in three seasons. It induces the growth of a cluster of thin, sickly shoots in place of one healthy one.

ÆCIDIUM ACTÆÆ, (Opiz), Wallr. On *Actæa alba* (White Baneberry), Big Woods, north of Columbus, June 23, 1889. *Actæa* sp., Sugar Grove, Fairfield Co., May 16, 1891. *Cim cyuga racemosa* (Black Snake-root, Black Cohosh), Sugar Grove, Fairfield Co., May 21, 25, 1891.

The æcidia occur on large, distinct, yellowish brown spots, with irregular borders; eventually the center of the spot turns black. The affected petioles and stems are much swollen and distorted.

Æ. ASTERUM, Schw. On *Aster cordifolius*, Georgesville, Franklin Co., Nov. 15, 1890; Columbus, May 15, 1891; Rock Mills, Fairfield Co., Oct. 25, 1891. *Aster* sp., Columbus, Nov. 1, 1890; Scioto river, Franklin Co., Nov. 6, 1890; Westerville, Franklin Co., Nov. 8, 1890. *A. sagittifolius*, Georgesville, Franklin Co., May 7, 1892. *Solidago latifolia* (Golden Rod), Sugar Grove, Fairfield Co., May 23, 1891. *S. serotina* (Golden Rod), Columbus, May 30, 1891; Sellsville, Franklin Co., May 30, 1891. Usually abundant.

Æ. ERIGERONATUM, Schw. On *Erigeron annuus* (Daisy Fleabane), Sugar Grove, May 21, 1891; abundant. *E. bellidifolius* (Robin's Plantain), Sugar Grove, May 25, 1891.

Æcidia on large yellow spots, somewhat swollen, covering the whole under surface of the radical leaves.

Æ. GROSSULARIÆ. Schum. On *Ribes cynosbati* (Wild Gooseberry), Columbus, May 14, 1891; Sellsville, Franklin Co., May 30, 1891, June 7, 1891; Georgesville, Franklin Co., May 7, 1892.

Æ. GERANII. On *Geranium maculatum* (Crane's bill), Georgesville, Franklin Co., May 7, 1892.

Æ. HOUSTONIATUM, Schw. On *Houstonia cœrulea* (Bluets, Innocence), Sugar Grove, Fairfield Co., May, 1891.

Æ. HYPNOIDEUM, B. and C. On *Dirca palustris* (Leatherwood, Moosewood), Sugar Grove, Fairfield Co., May 25, 1891.

Æ. IMPATIENS, Schw. On *Impatiens fulva* (Spotted Touch-me-not), Hayden's Falls, Franklin Co., May 30, 1891. *Impatiens* sp., Island in Olentangy river, Columbus, May 14, 1891, May 21, 1891; north of Columbus, May 31, 1891; Sugar Grove, Fairfield Co., May 25, 1891; Sellsville, Franklin Co., June 7, 1891; Columbus, 1892; extremely abundant.

Æ. NAPÆÆ, Arth and Holw. On *Napæa dioica* (Glade Mallow), Sugar Grove, Fairfield Co., May 24, 1891.

Æ. CENOTHERÆÆ. On *Cenothera biennis* (Evening Primrose), Lancaster, May 20, 1883; Columbus, May, 1891, June 11, 1891. On spots which are purple, sometimes blotched with yellow, and frequently there is a purple dash to the margin of the leaf.

Æ PUNCTATUM, Pers. On *Hepatica acutiloba* (Liverleaf, Hepatica), Columbus, woods near Insane Asylum, April, 1891, May, 1891; Sugar Grove, Fairfield Co., May 8, 1891; "Big Woods," Franklin Co., May 22, 1891.

The fungus occurs on the root leaves, which it affects in a peculiar manner. The normal three lobes are converted into five, the latter lobes being divided by a shallow cleft into two.

Æ. RANUNCULI, Schw. On *Ranunculus abortivus* (Small-flowered Crowfoot), Columbus, April 26, 1891; woods near Insane Asylum, Columbus, May 14, 1891; Sugar Grove, Fairfield Co., May 8, 1891. *R. septentrionalis* (Crowfoot), Sugar Grove, May 4, 1892.

Æ SOMMERFELTII, Johanson. On *Anemonella thalicroides* (Rue-Anemone), Hocking Co., five miles south of Sugar Grove, Fairfield Co., May 24, 1891.

UREDINEÆ. Reported as occurring in Ohio, but of which specimens have not been available for study.

UROMYCES HYPERICI, (Schw.) Curt. On *Hypericum multilum*, Lancaster, Oct. 10, 1882. Kellerman.

U. APENDICULATA (Pers.) Lev. On *Phaseolus* sp. (cult.) Lancaster, Oct. 30, 1882. Kellerman

PUCGINEA ANEMONE-VIRGINIANÆ, Schw. On *Anemone Virginiana*, Lancaster, O., July 23, 1883. Kellerman.

P. HASTATA. On *Viola hastata*, Lancaster, O., 1883. Kellerman.

P. SOLIDA. On *Anemone Virginiana*, Lancaster, O., 1883. Kellerman.

P. EPILOBII, D. C. On *Cenothera biennis*, II, Marble Cliff, west of Columbus, O., Nov. 7, 1890; rare. Craig.

P. GALII, Pers. On *Galium*, "Big Woods," east of Worthington, O., November, 1890 Craig.

P. GERANII, Corda. On *Geranium maculatum*, I, Sugar Grove, O.; "very rare." Stroma red. Craig.

P. SANICULÆ. On *Sanicula* sp. in det. Lancaster, O, 1883 Kellerman.

P. SP. ON *Osmorrhiza longistylis*, Sullivant's Hill, Columbus, O., April 18, 1891; Sugar Grove, O., May 24, 1891; very rare. Craig.

PHRAGMIDIUM, Link. On *Rosa*, Sugar Grove, O., May, 1891. Craig.

COLEOSPORIUM SOLIDAGINIS, Thum. On *Solidago bicolor*, September 17, 1882, Lancaster, O Kellerman. On *Solidago bicolor*, var. *concolor*, Lancaster, O, 1882. Kellerman. On *S. Canadensis*, Lancaster, O., Sept. 17, 1882. Kellerman. On *S. arguta*, Painesville, O., September 27, 1885, Werner. On *S. patula*, Columbus, O., Neil's Run, September 15, 1882. Devol.

C. SP. On *Aster cordifolius*, Columbus, O., April, 1891. Craig.

C. COMPOSITARUM. On *Aster punicens*, Lancaster, O., 1882. Kellerman. On *A. lævis*, Lancaster, O., 1882. Kellerman.

UREDO SMILACIS, Schw. On *Smilax rotundifolia*, Lancaster, O., October 20, 1882. Kellerman.

U. AGRIMONIÆ, D. C. *Agrimona eupatoria*, Lancaster, O. 1882. Kellerman.

U. FILICUM. On *Cystopteris fragilis*, Lancaster, O., 1883. Kellerman.

ÆCIDIUM RANUNCULACEARUM, D. C. On *Anemonella thalictroides*, Sugar Grove, O., May 24, 1891. Craig. See *Æ. Somerfeltii* in Descriptive Catalogue.

Æ. COMPOSITARUM. On *Solidago lævis* (?), Lancaster, O., 1883. Kellerman.

Æ. COMPOSITARUM, var. EUPATORIÆ. On *Eupatorium perfoliatum*, Lancaster, O., 1883. Kellerman.

Æ. CIMICIFUGATUM. On *Cimicifuga racemosa*, Lancaster, O., 1883. Kellerman.

Æ. PUSTULATUM, Curtis. On *Comandra umbellata*, "not fully developed," Georgesville, O., May 8, 1891. Selby.

Æ. OSMORRHIZÆ, Pk. On *Osmorrhiza longistylis*. See Puccinea on *Osmorrhiza longistylis*. Sullivant's Hill, Columbus, O., April 18, 1891. Craig.

RÆSTELIA, Rebert. On *Pyrus coronaria*, Sugar Grove, O., May 25, 1891. Craig. "Very immature and but few affected leaves found."

PIOLARIA BREVIPES, B. & Rav. On *Rhus toxicodendron*, Lancaster, O., 1882. Kellerman.

WILD LETTUCE.—A PESTIFEROUS WEED.

BY C. E. THORNE

The following description of what promises to be one of the worst weed pests of Ohio is by Prof. Aug. D Selby, Secretary of the Columbus Horticultural Society

“Prickly lettuce (*Lactuca Scariola*) is one of the many examples of introduced plants which thrive well here. It is, in fact, to be put among our troublesome weeds. It is a composite, as are the ox eye daisy, rag-weed, thistle, etc., and grows from four to six feet in height. It is biennial, sometimes annual, with a very leafy stem at this period of its growth, the lower part of stem and lower surface of midrib of the leaves beset with prickles. The leaves are alternate, 5 to 8 inches long, rarely exceeding one and three-fourth inches in width at widest part, clasping at base with conspicuous ears extending backward, and are wider toward the end. The edges are irregular and prickly-toothed. The leaves, though not so large, in shape and color strongly resemble the Cos varieties of cultivated lettuce. The plant is closely related to the cultivated lettuce (*L. Sativa*), which was formerly referred to this species as a variety. Once carefully note the appearance and shape of the leaves and it will be an easy matter for one to recognize this weed.

“The flowers, or heads more properly, come in branching clusters in July and later, are small and yellow, containing on an average eight to twelve separate flowers.

“The plant is introduced from Europe and first made its appearance in Ohio at Toledo in 1878. It appeared at Painesville in 1879, and was first observed upon the University farm at Columbus in 1882. In the addition of Gray's Botany, bearing date of 1867, it is mentioned as growing about Cambridge, Mass.

“From personal observation I can state that it is becoming introduced everywhere in Franklin county, and reports from other parts of the State indicate the same state of things elsewhere. There is scarcely another plant that has spread so rapidly over the country. To show how rapidly it is capable of spreading, Miss Detmers, of the Experiment Station, last summer made an estimate from the plants growing at the corner of King and Neil avenues, this city, with the following startling result: Plants to square foot, average, 3; heads to each plant, 688; flowers and seeds to each head, 12; total number of seeds to one plant, 8,256; average number of seeds to the square foot, 24,768; and per acre, the enormous number of 3,234,453,120!

“When we bear in mind the fact that each one of these numerous seeds, as in its near relative, the dandelion, is provided with a copious pappus which is sufficiently buoyant to enable it to go with the wind any where, we can better understand its rapid spread and promised extension.

“The remedy for it is simpler than in the case of the wild carrots and burdock. Twice or more times consecutive cuttings with scythe or hoe at this time in the year, when the plants are at a good height and are not yet blossoming, ought to eliminate them wherever started. Once cutting at the proper time will destroy the plant's growing, but the liability to find others the succeeding season must be remembered.

“As stated before, this cutting should be done before the plant has begun to ripen its seed, and the safe time is before blossoming.

“This is the year to begin to fight this weed, while it is yet confined to roadsides and waste grounds and before it has spread to remoter portions of the farms of the State.

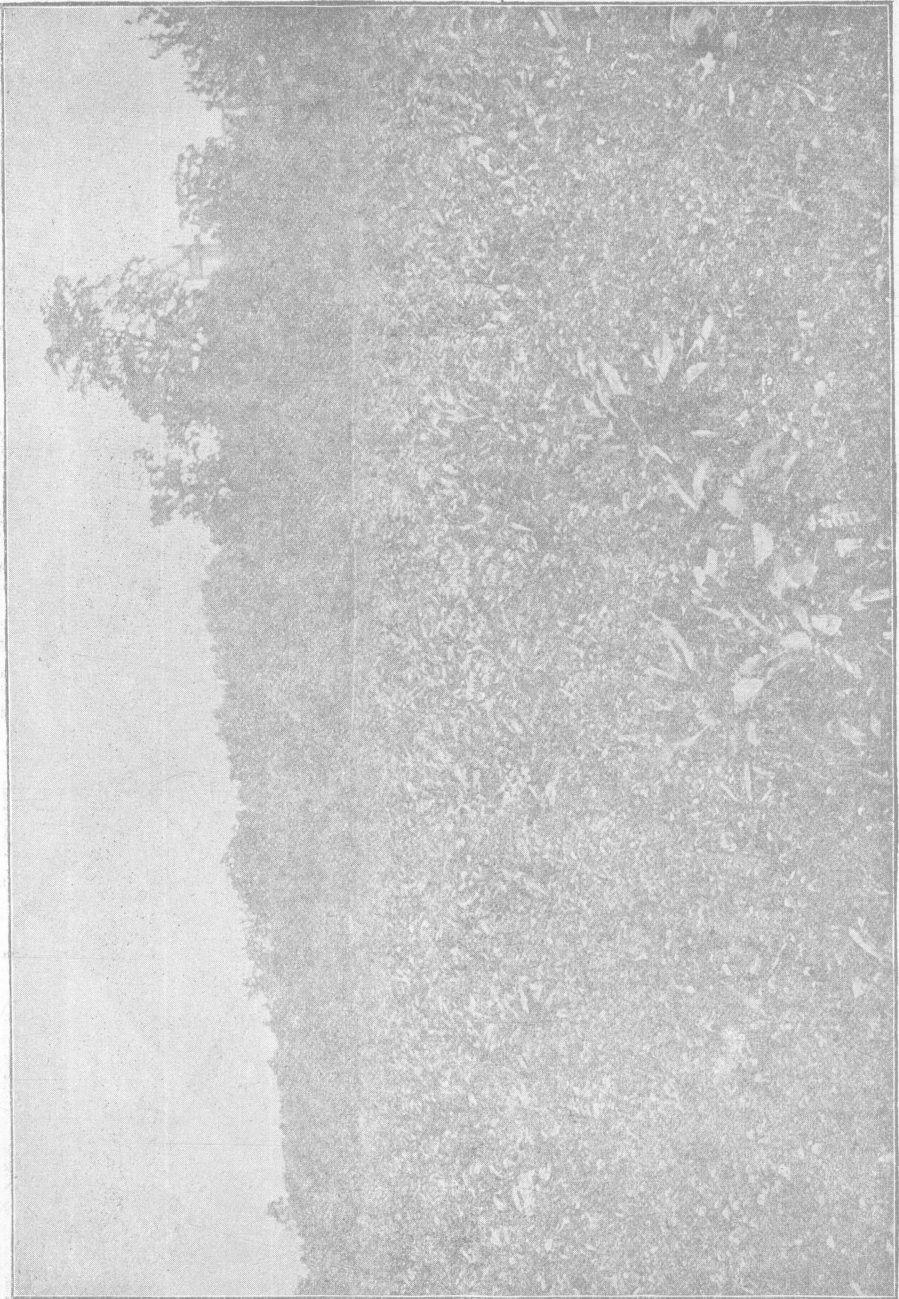
“It is not likely to be so troublesome in tilled lands, but there is danger that it may invade all pastures and fence-rows and become a veritable thief, adding its depredations to the already numerous weeds of the State”

The plate is reduced from one in the Society's Journal for September, 1890, drawn by Miss F. Detmers

“It shows a branch of the flower cluster with flowers; at *b* a section of stem with the characteristic leaves; and at *d* the seed or achenium with its pappus.”



PRICKLY LETTUCE (*L. crua* Scariola.)



PACKED LETTUCE IN CLOVER FIELD.

As an illustration of what this weed is capable of doing attention is called to Plate II, which is a reproduction of a photograph of one of the fields of the Experiment Station farm, taken just before clover harvest. This field had been in wheat for several seasons, but was seeded to clover the past spring. It lies on the south side of the farm, and adjoining it is a portion of the city of Columbus which has been laid off into building lots within the past three years, having previously been in pasture or commons. This has become a breeding ground for weeds of all descriptions, including this prickly lettuce. Being in the direction of the prevailing winds, its seeds were scattered over the wheat field, and when the field was sown to clover it found its opportunity and forthwith took possession.

An excellent stand of clover had been secured, and early in the spring the field was a beautiful sight; but, all this was changed into the ragged mass of weeds shown in the picture. The weeds were not yet in bloom when the clover was cut, and stalks and leaves were so coarse and full of sap as to materially interfere with the curing of the clover, necessitating the tedious job of taking the weeds out of the swath by hand.

Not only is this lettuce a pestiferous weed in itself, but the fact that it is the host of a fungus which also attacks the cultivated lettuce makes it doubly important that it should be destroyed wherever it appears. The following description and observations on this fungus are by Miss Detmers:

"The fungus is called *Septoria consimilis* and occurs on the leaves, forming dead-looking, brown spots, which are generally limited by the veins, and are more or less irregular and angular in outline. The lower leaves of the plant are usually first affected; the spots, at first isolated, spread very rapidly until finally the whole leaf becomes dead and brown.

"Scattered over these brown spots, on both sides of the leaf, are minute, slightly raised brown specks; these are the perithecia (Fig. 2, Plate III) or little capsules containing the spores. Looking at them with a good magnifying glass, one can see that they are perforated at the apex, and from this opening the spores ooze out in a little white tendril. These spores falling on the same or another leaf, under favorable circumstances, germinate; that is, they send out a delicate thread-like tube, which pushes its way through a breathing pore in the leaf, grows rapidly under the surface and forms a new diseased spot.

"Before this wild lettuce was so abundant, this fungus was, to my knowledge, rare in this State on the cultivated species. I do not think it has ever been found in the Experiment Station garden until this season. It is now very abundant on some lettuce left for seed."

Plate III.

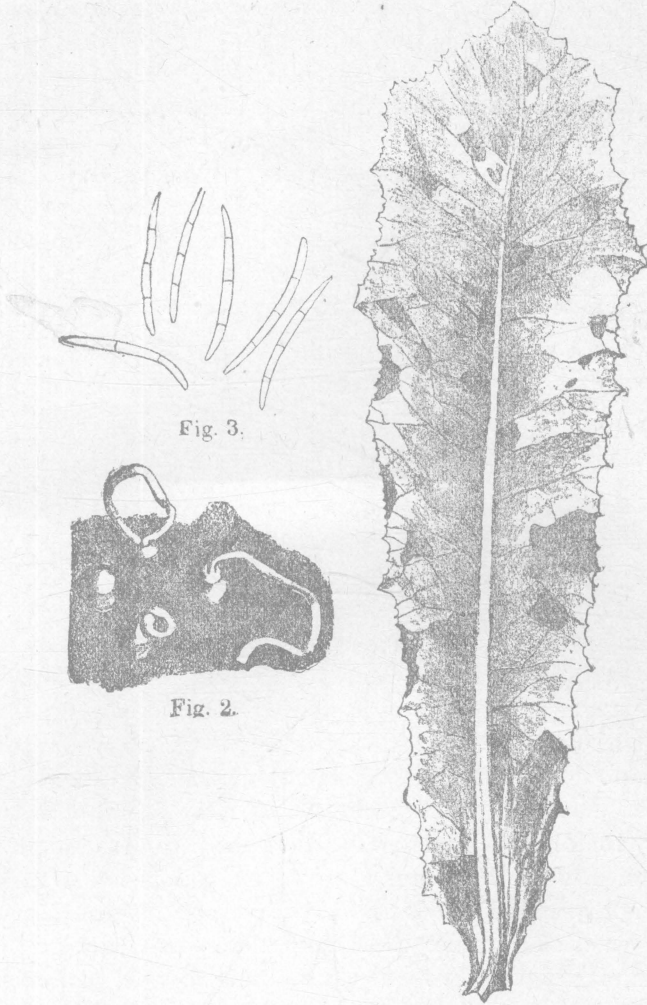


Fig. 1.

SEPTORIA CONSIMILIS.—F. Detmers, Del.

EXPLANATION OF PLATE III.

Fig. 1. Leaf of *Lactuca scariola* showing spots caused by the fungus *Septoria consimilis*. (Nat. size.)

Fig. 2. Perithecia with tendrils, of spores oozing out. (Much magnified.)

Fig. 3. Group of spores of *Septoria consimilis*. (Greatly magnified.)

SCAB OF WHEAT.

Fusisporium culmorum W. Sm.—BY FRED A DETMERS.

The disease known as Wheat Scab in Europe has become quite common in American wheat fields within the last two or three years. Where and when it first made its appearance in this country, I have not been able to find out. So far as I know, it has not been generally noticed until quite recently, and has not, in this country, been made the subject of especial study. It is, however, on the increase and did considerable damage during the past season, judging from reports received from all parts of the State, and from an examination of the Station wheat fields.

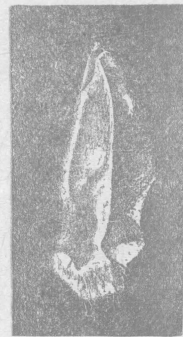
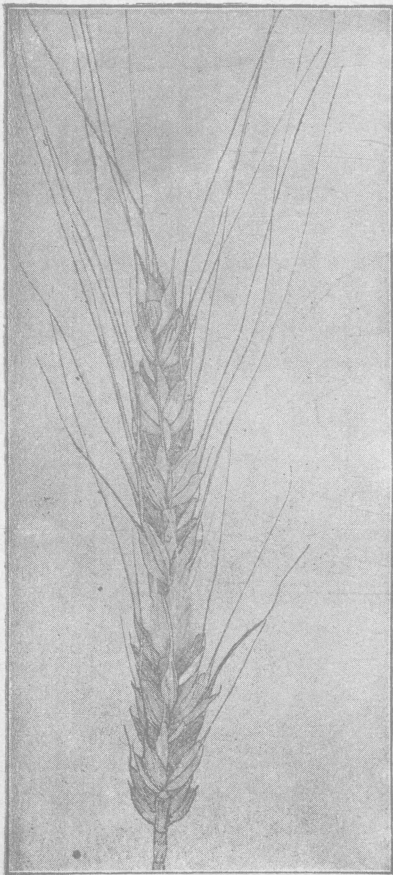


Fig. 5,

The disease is caused by a parasitic fungus, first described by Mr. Worthington G. Smith, of England, in 1884*, and named by him *Fusisporium culmorum*.

This fungus attacks the ears only of wheat, and appears as an orange-yellow or pinkish incrustation on the spikelets, gluing the glumes together. Its presence is best seen when the wheat is about half ripe; the affected portion of the ear ripens prematurely and is yellow, while the healthy portion is yet green. In well ripened grain its presence is marked by the shrunken appearance of the spikelets. The whole ear may be diseased, but more commonly the upper, lower or central portion only is affected, and quite often the disease is confined to a single spikelet, the adjoining ones being apparently healthy. (See Fig 4.)

The affected grain is very much shrunken and is covered externally by a thick white felted mass of the mycelium of the fungus. On cutting open the kernel it is found to be hollow and filled with the white mycelium (Fig. 5.) These shrunken grains will not germinate, but after having been placed in moist sand for a few days they assume a deep crimson color.

The fungus is composed of the mycelium and the orange-yellow or pinkish incrustation. The latter is composed of an immense number of crescent-shaped spores, which arise from a network of short branches of the mycelium, called hyphæ. Each hypha bears a single spore. The spores are divided by partitions or septæ into from four to six segments or cells, which finally become separate. Each cell can, under favorable circumstances, send out a minute, thread-like tube, which, on entering the wheat plant, produces the fungus anew. A spore is often found having its cells intact, several of which are germinating.

It is not known in what condition this fungus passes the winter. The so-called resting or winter spores have not been found on wheat. In his description of *Fusisporium Solani* on potatoes, Mr. W. G. Smith says that the segments into which the spores separate, "are at first squarish, but on alighting on any moist surface they speedily take a spherical form. Sometimes these little bodies do not germinate at once, but hibernate for a short time, generally varying from three weeks to three months, and during this period they become slightly spinulose, and faintly tinted with a brownish hue. These little bodies, therefore, hibernate after the manner of resting spores, and it is possible that many of them rest during the entire winter†."

* Diseases of Field and Garden Crops, London, pp 208, 211.

† Diseases of Field and Garden Crops, London, 1884.

These spherical bodies have not yet been found in wheat. Neither is it known how or when the growing wheat is attacked, or whether if diseased grain is sown with sound the resulting crop will be diseased.

A closely allied species of *Fusisporium*, *F. hordei* W. Sm., occurs on barley and is given in England the popular name of "Red Corns." Another species, *F. Lolii* W. Sm., is found on *Lolium Perenne* (Rye-Grass), while nearly half a dozen species are reported in this country on corn.

[In the report of the Athens County Agricultural Society to the Ohio State Board of Agriculture for 1865, we find the statement that "wet weather, rust and scab" have reduced the yield of wheat. Whether this is the same "scab" as that which has been so destructive to wheat in Ohio during the past two or three seasons we do not know, but similar climatic conditions seem to have prevailed. Apparently this fungus, like rust, attacks the wheat plant from outside, and not through the seed like smut, and, therefore, no treatment of seed is likely to be of avail in preventing the scab; but when we shall have learned how to prevent the rust it is probable that we shall be able to overcome the scab by the same means.—C. E. THORNE.]