

THE USTILAGINALES OF INDIANA.<sup>1</sup>

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The following list of the Ustilaginales or "smuts" of Indiana is based primarily on the material in the writer's herbarium and in that of the Purdue University Agricultural Experiment Station. All of the Indiana material in the herbarium of the New York Botanical Garden has also been included, most of the specimens deposited there being collections made in Indiana by Dr. L. M. Underwood during the period when he was connected with DePauw University. The only previous lists of the smuts of Indiana were included in the List of Cryptogams prepared by Dr. Underwood, which appeared in the Proceedings of the Indiana Academy for 1893, and in the Supplementary list of 1894. A total of sixteen species were recorded. A few other scattered records appear in the literature, several having been made in the various lists of the Fungi of Indiana, by Prof. J. M. VanHook, which have been published in the Proceedings at various times. No attempt has been made to include all the localities recorded for the more common species. In general only those specimens are listed which the writer has had an opportunity to examine. Several species are included, however, which are based on the distribution records in the monograph of the Ustilaginales by Dr. G. P. Clinton, published in the North American Flora Vol. 7, pt. 1, 1906.

The present list includes a total of forty-seven species on as many hosts. A large number of other species undoubtedly occur in our range. The writer would greatly appreciate it if collectors would furnish duplicates of specimens not recorded here, or which they may collect in the future, for use in preparing a supplementary list.

Acknowledgment is gratefully made to all those who have furnished specimens for study or who have assisted in any way in the preparation of the list.

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<sup>1</sup> Contribution from the Botanical Department of the Purdue University Agricultural Experiment Station.

## USTILAGINACEAE.

1. *Cintractia Caricis* (Pers.) Magn. Abh. Bot. Ver. Prov. Brand. 37:79. 1896.

*Uredo Caricis* Pers. Syn. Fung. 225. 1801.

## ON CYPERACEAE:

*Carex umbellata* Schk., beech woods, ½ mile S. W. Chestnut Ridge, May 11, 1913, C. C. Deam 127116.

This species has a wide distribution in America as well as in other parts of the world where *Carex* species are native. It should be found on other host species in Indiana. The sori occur in the ovaries and when mature are rather conspicuous subspherical bodies 3-4 mm. in diameter.

2. *CINTRACTIA JUNCI* (Schw.) Trel. Bull. Torrey Club 12:70. 1885.

*Caeoma Junci* Schw. Trans. Am. Phil. Soc. II. 4:290. 1832.

## ON JUNCACEAE:

*Juncus diffusissimus* Buckley, Versailles, Ripley County, June 18, 1915, C. C. Deam 16087.

*Juncus tenuis* Willd., Reynolds, White County, August 2, 1916, G. A. Osner.

3. *CINTRACTIA LUZULAE* (Sacc.) Clinton, Jour. Myc. 8:143. 1902.

*Ustilago Luzulae* Sacc. Myc. Ven. Spec. 73. 1873.

## ON JUNCACEAE:

*Juncoides campestre* (L.) Kuntze, Greensburg, Decatur County, May 10, 1889, J. C. Arthur; Terre Haute, Vigo County, May 12, 1917, C. C. Deam 22959; Kramer, Warren County, May 18, 1917, C. C. Deam 23104; Salem, Washington County, C. C. Deam 23194.

Previously known from North America only from the one collection made in 1889 by Dr. Arthur at Greensburg, Ind. The sori are in the ovaries but are inconspicuous and hence easily overlooked. The species is doubtless of much wider distribution in this State than the above collections would indicate.

4. *CINTRACTIA MONTAGNEI* (Tul.) Magn. Abh. Bot. Ver. Prov. Brand. 37:79. 1896.

*Ustilago Montagnei* Tul. Ann. Sci. Nat. III. 7:88. 1847.

## ON CYPERACEAE:

*Rynchospora glomerata* (L.) Vahl., Michigan City, Laporte County, September 13, 1916, H. S. Jackson and E. B. Mains.

5. MELANOPSISICHUM AUSTRO-AMERICANUM (Speg.) G. Beck, Ann. Nat. Hofmus. Wien 9:122. 1894.

*Ustilago austro-americana* Speg. Anal. Soc. Ci. Argent. 12:63. 1881.

## ON POLYGONACEAE:

*Persicaria pennsylvanica* (L.) Small, Plymouth, Marshall County, September 5, 1916, H. S. Jackson.

A species causing conspicuous hard black sori in the inflorescence.

6. SCHIZONELLA MELANOGRAMMA (DC.) Schröt. Beitr. Biol. Pfl. 2:352 1877.

*Uredo melanogramma* DC. Fl. Fr. 6:75. 1815.

## ON CYPERACEAE:

*Carex pennsylvanica* Lam., Shades, Montgomery County, May 16, 1913, F. D. Kern; Happy Hollow, Lafayette, Tippecanoe County, May 3, 1906, G. W. Wilson 5485; Battle Ground, Tippecanoe County, June 18, 1916, Evelyn Allison; Rochester, Fulton County, May, 1894, L. M. Underwood, Ind. Biol. Sur. 10, May 17, 1894, J. C. Arthur; Pine Creek, Warren County, May 5, 1917, G. N. Hoffer.

*Carex picta* Steud., Bloomington, Monroe County, May 25, 1917, J. M. VanHook 3746, June 9, 1917, C. C. Deam 23569; Brown County, June 16, 1912, C. C. Deam.

A very common species, occurring on the leaves, forming epiphyllous linear black sori, which superficially resemble those of a rust.

7. SOROSPORIUM CONFUSUM Jackson Bull. Torrey Club 35:148. 1908.

## ON POACEAE:

*Aristida* sp., Elberfeld, Warrick County, October 4, 1916, H. S. Jackson.

An inconspicuous species the sori of which occur in the ovaries, which remain enclosed in the glumes. This species was formerly confused with *S. Ellisii*, which is now interpreted as occurring only on *Andropogon*.

8. *SOROSPORIUM SYNTHERRISMÆ* (Peck) Farl.; Farl. & Seym. Host Index N. Am. Fungi 152. 1891.

*Ustilago Syntherrismæ* Peck, Ann. Rep. N. Y. State Mus. 27:103. 1875.

ON POACEAE:

*Cenchrus carolinianus* Walt., Michigan City, Laporte County, September 13, 1916, H. S. Jackson and E. B. Mains, Greencastle, Putnam County, October, 1892, L. M. Underwood, Ind. Biol. Sur. 6; Dayton, Tippecanoe County, November, 1917, H. S. Jackson.

*Panicum dichotomiflorum* Michx., Muncie, Delaware County, September 29, 1915, H. S. Jackson; Hammond, Lake County, October 14, 1914, F. J. Pipal.

The sori of this species as a rule cause the abortion of the entire inflorescence.

9. *SPHACELOTHECA SORGHII* (Link) Clinton, Jour. Myc. 8:140. 1902.

*SPORISORIUM SORGHII* Link, in Willd. Sp. Pl. 6<sup>2</sup>:86. 1825.

ON POACEAE:

*Sorghum vulgare* Pers. Muncie, Delaware County, September 29, 1915, H. S. Jackson; West Lafayette, Tippecanoe County, September 18, 1912, E. J. Petry, September 20, 1917, G. A. Osner, September, 1915, H. S. Jackson.

This, the kernel smut of sorghum, is evidently quite common. The head smut *S. Reilana*, which generally involves the whole inflorescence, has not yet been collected in Indiana.

10. *USTILAGO ANOMALA* J. Kunze, Wint. in Rab. Krypt. Fl. 1<sup>1</sup>:100. 1881.

ON POLYGONACEAE:

*Tiniaria scandens* (L.) Small, Fern, Putnam County, September, 1893, L. M. Underwood, Ind. Biol. Sur. 1; Crawfordsville, Montgomery County, September 20, 1908, V. B. Stewart 8.

11. *USTILAGO AVENAE* (Pers.) Jens. Charb. Céréales 4:1889.

*Uredo segetum Avenae* Pers. Tent. Disp. Fung. 57. 1897.

ON POACEAE:

*Avena sativa* L., Greencastle, Putnam County, June 1893, L. M. Underwood; Lafayette, Tippecanoe County, 1893; J. C. Arthur (Und. Ind. Biol. Surv. 2); West Lafayette, Tippecanoe County, June 10, 1908, F. D. Kern, June 25, 1916, J. C. Summers; Holman, Dearborn County,

1889 (?), H. L. Bolley; Crawfordsville, Montgomery County, June 1892, E. W. Olive; Plymouth, Marshall County, June 29, 1916, G. A. Osner; Surrey, Jasper County, July 10, 1917, Chas. Chupp; South Bend, St. Joseph County, October 28, 1916, M. C. Gillis; Oaktown, Sullivan County, June 25, 1916, J. C. Summers; Lebanon, Boone County, July 17, 1916, P. S. Lowe; Griffiths, Lake County, July 27, 1916, G. A. Osner.

12. *USTILAGO CALAMAGROSTIDIS* (Fuckel) Clinton, Jour. Myc. 8:138. 1902.

*Tilletia Calamagrostis* Fuckel, Symb. Myc. 40. 1869.

ON POACEAE:

*Calamagrostis canadensis* (Michx.) Beauv., Plymouth, Marshall County, June 21, 1916, G. A. Osner.

Evidently a rather rare species, but having a wide distribution. The sori occur on the leaves and sheaths and in general features the species resembles *U. Striaeformis*.

13. *USTILAGO CRAMERI* Körn.; Fuckel, Jahr. Nass. Ver. Nat. 27-28:11. 1873.

ON POACEAE:

*Chaetochloa italica* (L.) Scribn., West Lafayette, Tippecanoe County, September 14, 1915, H. S. Jackson.

14. *USTILAGO HORDEI* (Pers.) Kellerm. & Swingle, Ann. Rep. Kans. Agr. Exp. Sta. 2:268. 1890.

*Uredo segetum Hordei* Pers. Tent. Disp. Fung. 57. 1797.

ON POACEAE:

*Hordeum vulgare* L., Lafayette, Tippecanoe County, July 2, 1891, J. C. Arthur; Auburn, Dekalb County, July 19, 1917, F. J. Pipal.

This is the so-called covered smut of barley. It is undoubtedly much more common than the above listed collections would indicate.

15. *USTILAGO LEVIS* (Kell. & Sw.) Magn. Abh. Bot. Ver. Prov. Brand. 37:69. 1896.

*Ustilago Avenae levis* Kell. & Sw. Ann. Rep. Kans. Agr. Exp. Sta. 2:259. 1890.

ON POACEAE:

*Avena sativa* L., Lafayette, Tippecanoe County, June 1890, J. C. Arthur, June 26, 1915, C. A. Ludwig (Barth. Fungi Columb. 4795);

Griffiths, Lake County, July 27, 1916, G. A. Osner; Greencastle, Putnam County, June 1893, L. M. Underwood; Lebanon, Boone County, July 25, 1916, P. S. Lowe; North Liberty, St. Joseph County, August 9, 1916, G. A. Osner.

16. *USTILAGO NEGLECTA* Niessl, Rab. Fungi Eur. 1200. 1868.

*Erysibe Panicorum Panici-glauci* Wallr. Fl. Crypt. Germ. 2:216. 1833.

*Ustilago Panici-glauci* Wint.; Rab. Krypt. Fl. 1:97. 1881.

ON POACEAE:

*Chaetochloa glauca* (L.) Scribn., Lafayette, Tippecanoe County, 1893, J. C. Arthur (Und. Ind. Biol. Surv. 3); West Lafayette, Tippecanoe County, September 24, 1915, H. S. Jackson; Middletown, Henry County, September 30, 1915, H. S. Jackson; Argos, Marshall County, September 26, 1916, G. A. Osner.

17. *USTILAGO NUDA* (Jens.) Kell. & Sw. Ann. Rep. Kans. Agr. Exp. Sta. 2:277. 1890.

*Ustilago Hordei nuda* Jens. Charb. Céréales 4. 1889.

ON POACEAE:

*Hordeum vulgare* L., Manchester, Dearborn County, June 20, 1889, H. L. Bolley; Griffith, Lake County, July 27, 1916, G. A. Osner; Lafayette, Tippecanoe County, July 2, 1891, J. C. Arthur, June 22, 1917, H. S. Jackson; Fremont, Steuben County, June 27, 1910, O. S. Roberts; Auburn, Dekalb County, July 19, 1917, F. J. Pipal.

This, the loose smut of barley, is everywhere common and causes considerable loss each year. A collection made in the greenhouse showed infection on the sheaths and leaves as well as the inflorescence.

18. *USTILAGO PERENNANS* Rostr. Overs. K. Danske Vid. Selsk. Forh. 1890:15. Mr. 1890.

*Cintractia Avenae* Ellis & Tracy, Jour. Myc. 6:77. S. 1890.

ON POACEAE:

*Arrhenatherum elatius* (L.) Beauv., Lafayette, Tippecanoe County, June 10, 1897, Wm. Stuart.

19. *USTILAGO PUSTULATA* Tracy & Earle, Bull. Torrey Club 22:175. 1895.

ON POACEAE:

*Panicum dichotomiflorum* Michx., Evansville, Vanderburgh County, October 4, 1916, H. S. Jackson.

20. *USTILAGO RABENHORSTIANA* Kühn. Hedwigia 15:4. 1876.

ON POACEAE:

*Syntherisma sanguinale* (L.) Dulac., Greencastle, Putnam County, October 1892, L. M. Underwood, Ind. Biol. Surv. 5; Oakland City, Gibson County, October 5, 1916, H. S. Jackson; Michigan City, Laporte County, September 13, 1916, H. S. Jackson and E. B. Mains; Lafayette, Tippecanoe County, September 11, 1891, J. C. Arthur; West Lafayette, Tippecanoe County, September 3, 19, 1915, H. S. Jackson; Paoli, Orange County, September 27, 1915, H. S. Jackson; Marion, Grant County, October 11, 1915, F. J. Pipal; Plymouth, Marshall County, September 12, 27, 1916, G. A. Osner; Goshen, Elkhart Co., October 10, 1916, G. A. Osner; Evansville, Vanderburgh County, October 4, 1916, H. S. Jackson.

Perhaps the most common, at least the most frequently collected smut occurring on a native grass in our region. The entire inflorescence is usually affected.

21. *USTILAGO SPERMOPHORA* B. & C. Sacc. Syll. Fung. 7<sup>2</sup>:466. 1888.

ON POACEAE:

*Eragrostis major* Host., Middletown, Henry County, September 30, 1915, H. S. Jackson.

An inconspicuous but probably not uncommon species.

22. *USTILAGO SPHAEROGENA* Burrill, Sacc. Syll. Fung. 7<sup>2</sup>:468. 1888.

ON POACEAE:

*Echinochloa Crus-galli* (L.) Beauv., Blooming Grove, Franklin County, September 7, 1913, C. A. Ludwig; Lafayette, Tippecanoe County, October 5, 1909, A. G. Johnson, October 1, 1916, H. S. Jackson.

23. *USTILAGO TRITICI* (Pers.) Rostr. Overs. K. Danske Vid. Selsk. Forh. 1890:15. Mr. 1890.

*Uredo segetum Tritici* Pers. Tent. Disp. Fung. 57. 1797.

ON POACEAE:

*Triticum vulgare* (collective), Lafayette, Tippecanoe County, 1893, J. C. Arthur (Und. Ind. Biol. Surv. 4), June 20, 1916, H. S. Jackson; Greencastle, Putnam County, June 1893, L. M. Underwood; Brown County, May 1893, L. M. Underwood; Crawfordsville, Montgomery County, June 1892, M. B. Thomas; Wabash County, June 20, 1888, A. Miller 18; Plymouth, Marshall County, June 29, 1916, G. A. Osner; Petersburg, Pike Co., October 18, 1910, Blake A. Lamb; Mt. Vernon,



Posey County, May 14, 1910, A. G. Johnson; Franklin County, July 1, 1912, C. A. Ludwig; Claypool, Kosciusko County, June 11, 1916, R. C. Hathaway.

The loose smut of wheat is undoubtedly present in all counties of the State and is estimated to cause a reduction in yield of 3-4 per cent for the State. This means that from one to one and one-quarter million bushels are lost annually from this disease.

24. *USTILAGO STRIAEFORMIS* (Westend.) Niessl, *Hedwigia* 15:1. 1876.

*Uredo striaeformis* Westend. *Bull. Acad. Roy. Belg.* 18<sup>2</sup>:406. 1851.

ON POACEAE:

*Agrostis alba vulgaris* (With.) Thurb., Plymouth, Marshall County, June 22, 1916, G. A. Osner; Brazil, Clay County, June 22, 1917, G. A. Osner.

*Phleum pratense* L., Greencastle, Putnam County, May 1893, L. M. Underwood, *Ind. Biol. Surv.* 9; Plymouth, Marshall County, June 22, 1916, G. A. Osner; Lafayette, Tippecanoe County, June 24, 1898, Wm. Stuart; Monroeville, Morgan County, July 28, 1917, G. A. Osner.

*Poa pratensis* L., Plymouth, Marshall County, June 21, 29, 1916, G. A. Osner.

25. *USTILAGO UTRICULOSA* (Nees) Tul. *Ann. Sci. Nat.* III. 7:102. 1847.

*Cacoma utriculosa* Nees, *Syst. Pilze* 1:14. 1817.

ON POLYGONACEAE:

*Persicaria amphibii* (L.) S. F. Gray, Wabash County, October 16, 1890, A. Miller 10.

*Persicaria pennsylvanica* (L.) Small, Michigan City, Laporte County, September 13, 1916, H. S. Jackson and E. B. Mains; Lafayette, Tippecanoe County, October 3, 1915, H. S. Jackson; Muncie, Delaware County, September 29, 1915, H. S. Jackson; Plymouth, Marshall County, September 5, 1916, G. A. Osner, September 5, 1916, H. S. Jackson; Oakland City, Gibson County, October 5, 1916, H. S. Jackson.

26. *USTILAGO VILFAE* Wint. *Bull. Torrey Club* 10:7. 1883.

ON POACEAE:

*Sporobolus neglectus* Nash, West Lafayette, Tippecanoe County, October 23, 1912, E. J. Petry.



27. *USTILAGO ZEA* (Beckm.) Unger, *Einfl. Bodens* 211. 1836.  
*Lycoperdon Zeae* Beckm. *Hannov. Mag.* 6:1330. 1768.  
*Uredo Zeae* Schw. *Schr. Nat. Ges. Leipzig* 1:71. 1822.

ON POACEAE:

*Euchlaena mexicana* Schrad., Bloomington, Monroe County, Summer 1917, P. Weatherwax.

*Zea Mays* L., Greencastle, Putnam County, October 1893, L. M. Underwood, *Ind. Biol. Surv.* 7; Plymouth, Marshall County, September 5, 1916, H. S. Jackson; Lebanon, Boone County, August 1, 1916, P. S. Lowe; Grovertown, Starke County, August 22, 1917, C. R. Hoffer; Lafayette, Tippecanoe County, September 1, 1917, G. A. Osner.

The common corn smut is known in every county of the State. Only a few localities are listed, which include those from which specimens are preserved.

28. *USTILAGO* sp.

ON POACEAE:

*Secale cereale* L., Bainbridge, Putnam County, June 1917, G. A. Osner; Lafayette, Tippecanoe County, June 5, 1917, G. A. Osner; Surrey, Jasper County, July 10, 1917, Chas. Chupp.

A loose smut of rye, indistinguishable in its morphological characters from the loose smut of wheat, *U. Tritici*, has been found in three fields in Indiana. Usually only a portion of the florets are infected. The exact status of this smut must remain in doubt till infection work has been conducted.

TILLETIACEAE.

29. *DOASSANSIA DEFORMANS* Setch. *Proc. Am. Acad.* 26:17. 1891.

ON ALISMACEAE:

*Sagittaria latifolia* Willd., Michigan City, Laporte County, September 13, 1916, H. S. Jackson and E. B. Mains.

This species causes considerable distortion of the affected parts. The collection recorded above consisted in the main of a distorted flower stalk.

30. DOASSANSIA OPACA Setch. Proc. Am. Acad. 26:15. 1891.

ON ALISMACEAE:

- Sagittaria latifolia* Willd., Winona Lake, Kosciusko County, August 31, 1916, H. S. Jackson and G. N. Hoffer.

This species forms opaque spore balls in the mesophyll of the leaf causing considerable thickening.

31. ENTYLOMA AUSTRALE Speg. Anal. Soc. Ci. Argent. 10:5. 1880.

ON SOLANACEAE:

- Physalis pubescens* L., Greencastle, Putnam County, October 1893, L. M. Underwood, Ind. Biol. Surv. 8.

*Physalis subglabrata* Mackensie and Bush, Urmeyville, Johnson County, November 1890, E. M. Fisher 816.

32. ENTYLOMA CRASTOPHILUM Sacc. Michelia 1:540. 1879.

ON POACEAE:

- Muhlenbergia mexicana* (L.) Trin., Lafayette, Tippecanoe County, November 11, 1916, E. B. Mains.

This collection is referred to this species somewhat doubtfully. We have seen no other record of a species of *Entyloma* on this host species.

33. ENTYLOMA COMPOSITARUM Farl. Bot. Gaz. 8:275. 1883.

ON AMEROSIACEAE:

- Ambrosia elatior* L. (*A. artemisiacifolia* L.), Lafayette, Tippecanoe County, July 2, 1889, J. C. Arthur.

ON CARDUACEAE:

- Senecio aureus* L., Lafayette, Tippecanoe County, May 22, 1916, H. S. Jackson.

34. ENTYLOMA FLOERKEAE Holway; Davis, Trans. Wisc. Acad. 11:170. 1897.

ON LIMNANTHACEAE:

- Floerkea proserpinacoides* Willd., Lafayette, Tippecanoe County, May 8, 1898, J. C. Arthur.

A rather rare species reported otherwise only from Illinois, Ohio and Wisconsin. The writer has also collected it in Delaware.

35. ENTYLOMA LOBELIAE Farl. Bot. Gaz. 8:275. 1883.

ON LOBELIACEAE:

- Lobelia inflata* L., Bloomington, Monroe County, Campus Indiana Univ., October 26, 1915, J. M. VanHook 3664.

36. ENTYLOMA MICROSPORUM (Ung.) Schröt.; Rab. Fungi Eur. 1872.  
1874.

*Protomyces microsporus* Ung., Exanth. Pfl. 343. 1833.

ON RANUNCULACEAE:

*Ranunculus septentrionalis* Poir, Lafayette, Tippecanoe County, May 17, 1883, J. C. Arthur, May 29, 1894, K. E. Golden, May 1, 1906, G. W. Wilson 5473, October 29, 1916, H. S. Jackson.

37. ENTYLOMA POLYSPORUM (Peck) Farl. Bot. Gaz. 8:275. 1883.

*Protomyces polysporus* Peck; Thüm. Myc. Univ. 1813. 1881.

ON AMBROSIACEAE:

*Ambrosia elatior* L. (*A. artemisiaefolia* L.).

Reported on the above host from Indiana by Clinton (N. A. Flora 7:62. 1906). We have not seen specimens.

38. ENTYLOMA SANICULAE Peck, Ann. Rep. N. Y. State Mus. 38:100.  
1885.

ON AMMIACEAE:

*Sanicula* sp., Greencastle, Putnam County, May 1893, L. M. Underwood.

39. ENTYLOMA SPECIOSUM Schröt. & P. Henn. Hedwigia 35:220. 1896.

ON POACEAE:

*Panicum dichtomiflorum* Michx., Evansville, Vanderburgh County, October 4, 1916, H. S. Jackson.

Otherwise reported on this host (as *P. proliferum*) from North America only from Illinois. The specimen recorded above was obtained from the same plants on which *Ustilago pustulata* was collected.

40. ENTYLOMA VERONICAE (Wint.) Lagerh., Pat. & Lagerh. Bull. Soc. Myc. Fr. 7:170. 1891.

*Entyloma Linariae Veronicae* Wint.; Rab.-Wint. Fungi Eur. 3001. 1884.

ON SCROPULARIACEAE:

*Veronica perigrina* L., Lafayette, Tippecanoe County, April 18, 1916, May 6, 19, 1916, H. S. Jackson; Mt. Vernon, Posey County, May 11, 1916, H. S. Jackson.

A very common species in the vicinity of Lafayette, causing yellowish or whitish well defined spots on the leaves.

41. TILLETIA LAEVIS Kühn; Rab. Fungi Eur. 1697. 1873.

*Ustilago foetens* B. & C. Grevillea, 3:59. 1874.

ON POACEAE:

*Triticum vulgare* (collective), Haw Patch, July 17, 1889; Jonesboro, Grant County, July 30, 1910, Neill and VanHook; Fort Wayne, Allen County, July 21, 1910, O. S. Roberts; Franklin, Johnson County, July 5, 1909, Comm. E. A. Feight; New Carlisle, St. Joseph County, July 10, 1917, G. A. Osner.

This, the "stinking smut" or "bunt" of wheat, is much more widespread in the State than the above distribution would indicate.

42. TILLETIA TRITICI (Bjerk.) Wint. Rab. Krypt. Fl. 1':110. 1881.

*Lycoperdon Tritici* Bjerk. K. Sv. Vet.-Acad. Handl. 35:326. 1775.

ON POACEAE:

*Triticum vulgare* L., New Carlisle, St. Joseph County, July 10, 1917, G. A. Osner.

This specimen consists of a single head found mixed with the preceding species. This species undoubtedly occurs not infrequently in the northern part of the State. It is not to be expected that it is as common as *T. laevis* however.

The report of the occurrence in Indiana of *T. Tritici* made in the Proceedings for 1915 (p. 396) has been found to have been based on an error in determination.

43. UROCYSTIS AGROPYRI (Preuss) Schröt. Abh. Schles. Ges. Abth. Nat. Med. 1869-72:7. 1870.

*Uredo Agropyri* Preuss, in Sturm, Deutsch. Fl. III. 25:1. 1848.

ON POACEAE:

*Agropyron repens* (L.) Beauv., West Lafayette, Tippecanoe County, May 30, 1915, C. R. Orton and F. D. Fromme.

*Elymus virginicus* L., Lafayette, Tippecanoe County, July 22, 1917, E. B. Mains.

44. UROCYSTIS ANEMONES (Pers.) Wint.; Rab. Krypt. Fl. 1':123. 1881.

*Uredo Anemones* Pers. Tent. Disp. Fung. 56. 1797.

ON RANUNCULACEAE:

*Anemone virginiana* L., Lafayette, Tippecanoe County, April 24, 1906, G. W. Wilson.

*Hepatica acutiloba* DC., Lafayette, Tippecanoe County, May 29, 1893, J. C. Arthur, June 29, 1916, G. N. Hoffer.

45. UROCYSTIS CEPULAE Frost. Farl. Ann. Rep. Sec. Mass. Board Agr. 24. 175. 1877.

ON ALLIACEAE:

*Allium cepa* L.

Reported by Underwood (Proc. Ind. Acad. Sci. 1894:151. 1895), as occurring on onions in market, Putnam County, December 1893. Clinton (N. Am. Flora 7:57. 1906), also reports this from Indiana. A specimen in the N. Y. Botanical Garden, collected by Underwood in Indiana, is sterile. The species undoubtedly occurs in northern Indiana.

46. UROCYSTIS COLCHICI (Schlecht.) Rab. Fungi Eur. 396. 1861.

*Caecoma Colchici* Schlecht. Linnaea 1:241. 1826.

ON LILIACEAE:

*Quamasia hyacinthina* (Raf.) Britton, Lafayette, Tippecanoe County, May 30, 1907, F. Vasku, May 22, 1916, H. S. Jackson, May 1917, G. N. Hoffer.

These collections are referred here somewhat doubtfully. The writer is unaware of any record of the occurrence of Urocystis on this host genus though he has made similar collections in Oregon on a western member of the genus.

47. UROCYSTIS OCCULTA (Wallr.) Rab.; Klotzsch. Herb. Viv. Myc. II. 393. 1856.

*Erysibe occulta* Wallr. Fl. Crypt. Germ. 2:212. 1833.

ON POACEAE:

*Secale cereale* L., Plymouth, Marshall County, June 20, 1916, G. A. Osner; Avilla, Noble County, June 23, 1908, H. H. Whetzel; Lafayette, Tippecanoe County, June 1917, H. S. Jackson; Brainbridge, Putnam County, June 27, 1917, G. A. Osner.

The flag smut of rye is evidently not uncommon, but usually causes little damage.

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