Rust of Hamilton and Marion Counties, Indiana.

By Guy West Wilson.

The present catalogue of *Uredinales* is based chiefly upon a collection of thirty-eight species made in the southern part of Hamilton and the northern part of Marion counties between the 3d of August and the 2d of September of the present season. The hosts number forty-four, of which *Aster paniculatus* and *Avena sativa* were the most prolific, the former harboring three and the latter two species. Previously but two species, *Gymnoconia interstitialis* and *Dicaeoma canaliculata*, had been collected in this region. The former did not reappear in this collection, thus making the total number of species to date thirty-nine. This, however, can be regarded merely as a preliminary catalogue, as the collecting season was too short and the time which could be devoted to the work too limited to make an exhaustive collection. A number of other species have been observed in previous years, but as no specimens were collected they are not included in the present list. Careful collecting in this region would probably double the number of species and would certainly greatly extend the list of hosts for those already collected, as the host plants of forty-five other Indiana rusts as well as some thirty-five additional hosts of those here enumerated occur in this region.

Of the species catalogued, twelve may be classed as injurious, as their hosts are cultivated plants. A few other species occur upon plants which are cultivated elsewhere, and in such localities would be properly classed as injurious, while in the present instance they might even be considered beneficial species. Among the injurious species first place belongs to the grain rusts *(Dicaeoma poculiforme* and *D. rhamni)*, which often seriously reduce the yield of small grains. Of scarcely less importance is the blackberry rust *(Gymnoconia interstitialis)*, which was disastrously abundant in this region a half dozen years ago. So great was its ravages that a considerable acreage of blackberries which were cultivated for market had to be removed. The rust was not seen this season and was not abundant last, so the fruitgrowers are again putting out blackberries.* The Carolina poplar, which is used as a shade tree in towns, is sometimes seriously

*Abundant on wild sps. of *Rubus* in May, 1906.

affected by a rust *(Mêlampsora medusæ)*. The clover rust *(Cacomurus trifolii)* was found sparingly on alsike clover and abundantly on red clover, causing some damage to the crop in places. The asparagus rust *(Dicaeoma asparagi)*, so far as it was observed, occurs only upon wild plants, and as this vegetable is not cultivated extensively in the infested region it has little economic importance save as a menace to the occasional asparagus beds in the vicinity. The corn rust *(Dicaeoma sorghi)* was very abundant this season, but is not credited with any serious damage.

The five remaining species are to be regarded as injurious or not according to the host which they infest. The most important of these is the bean rust *(Cacomurus phaseoli)*, which was collected on corn beans and seen abundantly on dwarf beans, which it damaged to a considerable extent. This rust also occurs abundantly on a wild bean *(Strophostyles helvola)* which is a serious pest in low river bottoms. The various wild sunflowers as well as the common species *(Helianthus annuus)* are often seriously affected by a rust *(Dicaeoma helianthi)*. By the middle of August the plants of the common sunflower in some sections of Indianapolis were almost defoliated, and such leaves as did remain were rendered unsightly by this rust. Had only that multitude of sunflowers which abound in the river bottoms and about the dumps of the city been infected, this rust would deserve a place among the beneficial species. All the wild species of aster are used for ornament, especially in country gardens, hence the three aster rusts *(Coleosporium solidaginis, Dicaeoma asteris* and *D. caracisasteris)* assume the role of injurious species. This is especially true of the last species, which often sadly disfigures its host.

A number of species occur upon weeds of greater or less importance and so are to be considered beneficial, inasmuch as they assist in keeping these pests in check. Of these the rust of the wild morning-glory *(Dicaeoma convolvuli)* and of the bind weed *(Dicaeoma polygoni-convolvuli)* are probably the most important, as their hosts are among the worst of the rust-bearing weeds of the region. The rust of the cocklebur and horse weed *(Dicaeoma xanthii)* also deserves mention. The iron weed rust *(Coleosporium vernoniæ)* is common and often entirely covers the lower surface of the leaves of its host to the serious injury of the latter.

At the time this collection was made conditions favored the detailed study of the rust flora of a limited area, to wit, section 5, range 4 east.

township 17 north. This section has an area of about seven hundred acres and is bounded on three sides and crossed from north to south by public highways. The land is gently rolling with a sandy loam soil and a red clay subsoil. In the northwest quarter is what was once a lake but is now a flourishing cornfield, on the western border of which a few small bogs remain undiched. This region is drained by a ditch which is partly open, and which crosses the low black lands of the southeastern quarter of the section. Of the forty or fifty acres of timber land scarcely an acre can be said to be in a state of nature, while the greater portion of this area is closely pastured and part of it is in process of clearing. The present population is sixty-six and is entirely agricultural. The staple crops are corn, wheat, oats, timothy and clover. Some fruit and a few vegetables are grown for market, but usually for home consumption only. The ornamentals are those usually found about country homes. The farms are kept as free from weeds as in the average Indiana neighborhood. Such a region is scarcely an inviting collecting ground and would often be passed by as unworthy of attention, yet it yielded thirty-six species of rusts on forty-three hosts. These are marked with an asterisk (*) in the catalogue.

The nomenclature of host plants is that of Britton's Manual, while the rusts are named in accordance with the usually accepted nomenclature. Synonyms are given for hosts when they have a different name in Gray's Manual and for the rusts when the last published notice of these was under a different name from that used in this catalogue. Reference to previous publication in the Proceedings of the Academy are by year and page. A set of specimens of this collection has been deposited in the herbarium of Dr. Arthur, who has kindly verified all determinations.

Order UREDINIALES.

Family COLEOSPORIACEAE.

1. COLEOSPORIUM SOLIDAGINIS (*Schw.*) *Thuem.*
   *On Aster ericoides L. Hamilton.
   *On Aster paniculatus Lam. Hamilton.
   *On Solidago canadensis L. Hamilton, Marion.

2 COLEOSPORIUM VERNONIÆ *B. and C.*
   *On Vernonia fasiculatus Michx. Hamilton.

Family MELAMPSORACEAE.

3. PUCCINIASTRUM AGRIMONIAE (*DC.*) *Diet.*

*On Agrimonia mollis (T. & G.) Britt. (*A. parviflora* Ait.) Hamilton.

4. MELAMPSORA BIGELOWII *Thuem.* (*M. farniosa* (Pers.) Schrœt.)

On Salix cordata Muhl. Hamilton.

*On Salix fluviatilis Nutt. (*S. longifolia* Muhl.) Hamilton, Marion.

5. MELAMPSORA MEDUSAE *Thuem.*

*On Populus deltoides Marsh. (*P. monilifera* Muhl.) Hamilton, Marion.

Family PUCCINIACEAE.

6. GYMNOCONIA INTERSTITIALIS (*Schl.*) *Lagh.* (*Puccia interstitialis* Schl.) Tranzschel.)

*On all species of Rubus. Hamilton. 1894 : 157.

7. CAEOMURUS CALADII (*Schw.*) *Kuntze.*

On Arisaema dracontium (L.) Schott. Hamilton.

*On Arisaema triphyllum (L.) Torr. Hamilton.

8. CAEOMURUS EUPHORBIÆ (*Schw.*) *Kuntze.*

On Euphorbia dentata Michx. Hamilton, Marion.

*On Euphorbia humistrata Engelm. Hamilton.

*On Euphorbia maculata L. Hamilton.

*On Euphorbia nutans Lag. (*E. hypericifolia* Gr.) Hamilton, Marion.

9. CAEOMURUS HEDYSARI-PANICULATI (*Schw.*) *Arth.*

*On Meibomia sessilifolia (Torr.) Kuntze.? (*Desmodium s.*). Hamilton.

*On Meibomia viridiflora (L.) Kuntze. (*Desmodium v.*) Hamilton, Marion.

10. CAEOMURUS HOWEI (*Pk.*) *Kuntze.*

*On Asclepias syriaca L. (*A. cornuti* Dec.) Hamilton, Marion.

11. CAEOMURUS JUNCI (*Schw.*) *Kuntze.*

*On Jancus tenuis Willd. Hamilton, Marion.

12. CAEOMURUS PERIGYNIUS (*Halst.*) *Kuntze.*

*On Carex utriculata Boot. Hamilton.

13. CAEOMURUS PHASEOLI (*Pers.*) *Arth.*

*On Phaseolus vulgaris L. Hamilton.

On Strophostyles helvola (L.) Britt. (*Phaseolus diversifolius* Pers.) Marion.

14. CAEOMURUS POLYGONI (*Pers.*) *Kuntze.*
    *On Polygonum aviculare L. Hamilton.
15. CAEOMURUS TRIFOLII (*Hedw.*) *Gray*
    *On Trifolium hybridum L. Hamilton.
    *On Trifolium pratense L. Hamilton, Marion.
16. DICAEOMA ANGUSTATUM (*Pk.*) *Kuntze.*
    *On Scripus atrovirens Muhl. Hamilton.
17. DICAEOMA ASPARAGI (*DC.*) *Kuntze.*
    On Asparagus officinale L. Hamilton.
18. DICAEOMA ASTERIS (*Duby*) *Kuntze.*
    *On Aster paniculatus Lam. Hamilton.
19. DICAEOMA CANALICULATA (*Schw.*) *Kuntze.* (*Puccinia indusiata* D. & H.)
    *On Cyperus strigosus L. Hamilton. 1894 : 157.
20. DICAEOMA CARACIS-ASTERIS *Arth.*
    *On Aster paniculatus Lam. Hamilton.
21. DICAEOMA CARACIS-SOLIDAGINIS *Arth.*
    *On Carex conoidea Schkuhr. Hamilton.
22. DICAEOMA CIRCAEAE (*Pers.*) *Kuntze.*
    *On Circaea lutetiana L. Hamilton.
23. DICAEOMA CONVOLVULI (*Pers.*) *Kuntze.*
    On Convolvulus sepium L. Hamilton, Marion.
24. DICAEOMA DAYI (*Clint.*) *Kuntze.*
    *On Sterionema ciliatum (L.) Raf. Hamilton.
25. DICAEOMA EMACULATUM (*Schw.*) *Kuntze.*
    *On Panicum capillare L. Hamilton.
26. DICAEOMA HELIANTHI (*Schw.*) *Kuntze.*
    On Helianthus annuus L. Hamilton, Marion.
    On Helianthus tuberosus L. Marion.
    *On Helianthus sp. Hamilton.
27. DICAEOMA LATERIPES (*B. and R.*) *Kuntze.*
    On Ruellia stripens L. Hamilton.
28. DICAEOMA MENTHAE (*Pers.*) *Gray.*
    *On Agastache nepetioides (L.) Kuntze. (*Lophanthus n.*) Hamilton.
    *On Blephia hirsuta (Pursh.) Torr. Hamilton.
    On Mentha canadensis L. Hamilton.
    On Monarda fistulosa L. Hamilton.
29. DICAEOMA MUHLENBERGIAE (*A. & H.*) *Arth.*
    *On Muhlenbergia diffusa Schreb. Hamilton.

30. DICAEOMA POCULIFORME (*Jacq.*) *Kuntze.*
*On Agrostis alba L. Hamilton.
*On Avena sativa L. Hamilton.
*On Triticum vulgare L. Hamilton.

31. DICAEOMA PODOPHYLLI (*Schw.*) *Kuntze.*
*On Podophyllum peltatum L. Hamilton.

32. DICAEOMA POLOGONI-AMPHIBII (*Pers.*) *Arth.*
*On Polygonum emersum (Michx.) Britt. (*P. muhlenbergii* Wats.) Hamilton.

33. DICAEOMA POLYGONI-CONVOLVULI (*Hedw.*) *Arth.*
*On Polygonum convolvulus L. Hamilton, Marion.

34. DICAEOMA PUNCTATUM (*Str.*) *Arth.*
*On Galium concinctum T. & G. Hamilton.
*On Galium trifidum L. Hamilton.
On Galium tinctorium L. Hamilton.

35. DICAEOMA RHAMNI (*Gmel.*) *Kuntze.*
*On Avena sativa L. Hamilton.

36. DICAEOMA SORGHI (*Schw.*) *Kuntze.*
*On Zea mays L. Hamilton, Marion.

37. DICAEOMA TARAXACI (*Plowr.*) *Kuntze.*
*On Taraxacum taraxacum (L.) Karst. (*T. officinale* Weber.) Hamilton, Marion.

38. DICAEOMA XANTHII (*Schw.*) *Kuntze.*
*On Ambrosia trifida L. Hamilton.
On Xanthium canadense Mill. Hamilton, Marion.

39. GYMNOSPORANGIUM GLOBOSUM *Farl.*
*On Crataegus punctata Jacq. Hamilton.

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