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NOTES ON SOME IOWA CLADONIAS

ALFRED R. STANLEY

This paper is preliminary to a more complete study of this group of lichens. Up to the present time, I have examined, aside from my own field collections in the vicinity of Oskaloosa two herbaria.

To date I have found twenty species of *Cladonia* collected in Iowa. This number does not include the major varieties but only distinct species as set out by Fink.¹ They are as follows: *Cladonia bacillaris*, *C. cariosa*, *C. cormicopiodes*, *C. cristatella*, *C. delicata*, *C. fimbriata*, *C. furcata*, *C. gracilis*, *C. macilenta*, *C. mitrula*, *C. pulchilla*, *C. putchella*, *C. pyxidata*, *C. rangiferina*, *C. equamosa*, *C. sylvatica*, *C. symphycarpa*, *C. turgida*, *C. uncialis*, *C. verticillata*.

Of these, there are three, *C. bacillaris*, *C. sylvatica*, and *C. verticillata*, not found in the University of Iowa collection. Six of them, *C. bacillaris*, *C. cariosa*, *C. putchella*, *C. sylvatica*, *C. turgida*, and *C. verticillata*, are not found at Grinnell. Bruce Fink in his "Lichens of Minnesota"¹ has all but four, *C. cormicopiodes*, *C. pulchilla*, *C. putchella*, and *C. symphycarpa*. B. O. Wolden in his list of Cladonias in the 1919 Proceedings of the Iowa Academy of Science² has seven species, *C. bacillaris*, *C. cristatella*, *C. fimbriata*, *C. mitrula*, *C. pyxidata*, *C. sylvatica*, and *C. verticillata*.

A microscopic study of my collections show that the thallus consists of only three layers, the lower cortex being missing. The algal cells, according to Fink,¹ are *Systococcus* and are arranged in a distinct layer between the cortex and loose hyphae.

My field collection of *C. pyxidata* had only sterile podetia. They are cup shaped and covered with squamules. The reddish apothecia are borne on short stalks around the rim of this cup.

The reddish-brown apothecia of *C. mitrula* are borne on squamulose podetia which often branch just before the apothecia are formed thus making a group of them at the end of the podetium.

C. squamosa has sterile podetia which are spike-shaped, covered with squamules and are fairly large while *C. delicata* has small spike-shaped podetia almost devoid of squamules.

Besides these species mentioned, I have collected *C. rangiferina* or reindeer moss, which is well known, and two species which I have not been able to identify as yet.

¹ Fink, Bruce. The Lichens of Minnesota. Contribution from the U. S. Nat'l. Herbarium. Vol. 14, Part 1, p. 107-129. 1910.

² Wolden, B. O. The Moss and Lichen Flora of Western Emmet County. Proc. Ia. Acad. Sci. Vol. 26, p. 259-267. 1919.

In preparing this paper, I am greatly indebted to Professor Guy West Wilson, under whom I am studying, for his valuable suggestions and help, and to the Botanical Departments of the University of Iowa and Grinnell College for the use of their *Cladonia* collections.

PENN COLLEGE,
OSKALOOSA, IOWA.

ADDITIONAL NOTES ON IOWA MOSSES — 1929-1930

BETTY BLAGG

Since the meeting of the Iowa Academy of Science in May, 1929, several additions have been made to the collections of H. S. Conard, B. O. Wolden, and Betty Blagg. In order to prevent an inconveniently large number of moss lists, the additions of all three collectors have been combined into one list. Only those new to the state are included although a number of species have been added to all three collections which have been reported for Iowa only once.

One new family not before reported for Iowa is represented by *Encalypta streptocarpa* found in the Backbone State Park near Strawberry Point. Mr. Wolden reports a *Grimmia* which George Neville Jones identifies as *G. glauca* and says that this is the third time this species has been collected in the United States.

Physcomitrium immersum of the 1928 list proves to be *Aphanorregma serratum* (Hook & Wils.) Sull.

Grateful acknowledgment is due H. S. Conard and B. O. Wolden for their interest and cooperation in combining the lists. The writer is also indebted to A. J. Grout, E. B. Bartram, George B. Kaiser, and George Neville Jones for determinations and verifications of doubtful species.

The list of mosses hitherto unreported for Iowa follows with initials indicating the collectors:

POLYTRICHACEAE

Polytrichum Ohioense R. & C.-----C.
Moore, Poweshiek co.; May 25, 1929; on ground.

FISSIDENTACEAE

Fissidens bryoides (L.) Hedw.-----W.
Estherville; Mar. 29, 1928; on ground.

DICRANACEAE

Dicranum montanum Hedw.-----C.
Eldora, Hardin co.; May 17, 1929; base of tree.

GRIMMIACEAE

- Grimmia glauca* Cardot..... W.
 Lyon co.; June 9, 1928; on Sioux quartzite.

TORTULACEAE

- Phascum cuspidatum piliferum* (Schreb.) Hook & Taylor..... C.
 Redrock, Marion co.; Apr. 2, 1930; on ground.
Astomum Sullivantii Schimp..... W.
 Prairie hillside near Estherville; Dec. 26, 1928; on ground.
Astomum crispum (Hedw.) Hampe..... C.
 Redrock, Marion co.; Apr. 2, 1930; on ground.
Tortella fragilis (Drumm.) Limpr..... B.
 Backbone State Park, Strawberry Point; June 15, 1929; on limestone.

ENCALYPTACEAE

- Encalypta streptocarpa* (Hedw.)..... B.
 Backbone State Park, Strawberry Point; June 15, 1929; on limestone.

ORTHOTRICHACEAE

- Ulotia Americana* (Beauv.) Lindb..... B.
 Near Albany spring, Fayette co.; June 14, 1929; on dry rock.

BRYACEAE

- Bryum bimum* Schreb..... W.
 Prairie near Estherville; May 25, 1929; on springy ground.

LESKEACEAE

- Leskea Austini* Sulliv..... W.
 Mud Lake, Emmet co.; Sept. 10, 1928; on bark.

HYPNACEAE

- Bryhnia graminicolor* (Brid.) Grout..... C.
 Hardin co.; May 18, 1929; on stones.
Calliergon cuspidatum (L.) Kindb..... W.
 Bog north of Estherville; Sept. 10, 1928.
Amblystegium noterophyllum (Sulliv.) Warnst..... C.
 Clayton co. Sept. 12, 1929; in rapid water at mouth of cave at Beulah
 Fall.
Hypnum reptile Mx..... W.
 Estherville; Dec. 15, 1928; base of stump.
Plagiothecium geophilum Aust..... C.
 Redrock, Marion co.; Apr. 2, 1930; on earth.
Plagiothecium denticulatum (L.) B. & S..... C. W. B.
 Marion co. Apr. 2, 1930.
 Estherville, Aug. 8, 1928; on elm.
 North woods, Ames, July 31, 1928; on bark.
Plagiothecium Roseanum (Hampe) B. & S..... C.
 Marion co. Apr. 2, 1930; on ground.

In addition to the mosses, Dr. Conard reports nine hepatics not formerly found in Iowa.

MARCHANTIAACEAE

- Preissia quadrata* (Scop.) Nees.
 Moist, shaded, rocky bank, Clayton co.; Sept. 12, 1929; ster.

JUNGERMANIACEAE

- Calyptogeia trichomanis* (L.) Corda.
 Moist sandstone cliff, Marion co.; Apr. 2, 1930; ster.

- Cephaloziella divaricata* (Sm.) Schiffn.
Sandstone ledge, Jasper co.; Apr. 5, 1929; fr.
Jamesoniella autumnalis (DC.) Steph.
Rocky hillside, Marion co.; Apr. 2, 1930; fr.
Lepidozia reptans (L.) Dum.
Cool, shaded, rocky bank, Hardin co. ster.
Lophocolea minor Nees.
Moist, shady bank, Hardin, Jasper, Marion; ster.
Plagiochila asplenoides (L.) Dum.
Shady banks, Hardin, Marion, Jasper; ster.
Porella platyphylloides (Schwein.) Lindb.
Delaware co. Sept. 11, 1929; ster.
Scapania nemorosa (L.) Dum.
Marion co. Apr. 2, 1930; ster.
Moist sandstone.

GRINNELL COLLEGE,
GRINNELL, IOWA.

NOTES ON IOWA MOSSES. — II

LUCY M. CAVANAGH

The object of this paper is to note, with comments and corrections, certain published lists of Iowa mosses.

A short paper by the late Dr. Charles E. Bessey¹ is, so far as the writer is able to find, the first published list of Iowa mosses.

In order to put this list into a more usable form it is here rearranged according to the classification and nomenclature of the Grout key.² Where the names used by Grout differ from those in the Bessey list, the latter appear in parenthesis.

DR. BESSEY'S LIST

- Catharinea angustata* Brid. (*Atrichum angustatum* B. & S.)
Polytrichum commune L.
Polytrichum juniperinum Willd.
Fissidens bryoides (L.) Hedw.
Ceratodon purpureus (L.) Brid.
Dicranella varia, (Hedw.) Schimp.
Leucobryum glaucum (L.) Schimp. (*L. vulgare* Hampe)
Astomum nitidulum Schimp.
Barbula sp.
Weisia viridula (L.) Hedw.
Orthotrichum strangulatum Sulliv.
Physcomitrium turbinatum (Mx.) Brid. (*P. pyriforme* Brid.)
Physcomitrium Hookeri Hampe.
Funaria hygrometrica var. *clavescens* B. & S.

¹ Bessey, Dr. C. E. *Preliminary List of Bryophytes of the Ames Flora*. Bull. Dept. of Bot., I. A. C. Nov., 1884.

² Grout, A. J. *Mosses with Hand-lens and Microscope*, 1903.

Timmia megapolitana Hedw.
Bartramia pomiformis (L.) Hedw.
Bryum intermedium Brid.
Bryum argenteum L.
Mnium cuspidatum (L.) Leys.
Thuidium delicatulum (L.) Mitt. (*Hypnum delicatulum* L.)
Anomodon minor (P. Beauv.) Fuern. (*A. obtusifolius* B. & S.)
Anomodon rostratus (Hedw.) Schimp.
Brachythecium oxycladon (Brid.) J. & S. (*Hypnum laetum* Brid.)
Brachythecium acuminatum var. *rupincolum* Sull. & Lesq. (*Hypnum acuminatum* var. *rupincolum*)
Climacium dendroides (L.) Web. & Mohr.
Amblystegium serpens (L.) B. & S. (*Hypnum serpens* L.)
Amblystegium serpens var. *radicalis* Aust. (*Hypnum radicale* Beauv.)
Hypnum imponens Hedw.
Entodon cladorrhizans (Hedw.) C. M. (*Cylindrothecium cladorrhizans* Sch.)
Platygyrium repens (Brid.) B. & S.
Pylaisia polyantha (Schreb.) B. & S.
Pylaisia Schimperii R. & C. (*P. intricata* B. & S.)
Pylaisia intricata (Hedw.) R. & C. (*P. velutina* B. & S.)

Climacium americanum Brid., a rather common species in Iowa, does not appear in this list. *C. dendroides*, however, is included, but it is an exceedingly rare species in Iowa, and Grout ³ says of it that it is "not reported from the North Central States." It therefore seems probable that the specimen to which Dr. Bessey referred was *C. americanum*. An attempt was made to verify this, but so far Dr. Bessey's specimens have not been located.

In a more recent paper ⁴ a rearrangement of Dr. Savage's list of Iowa mosses ⁵ was presented. This paper, however, contains certain errors and omissions, in part probably typographical errors, which are here noted.

Barbula fallax Hedw., *Platygyrium repens* (Brid.) B. & S., *Brachythecium rivulare* B. & S. and a form of *Brachythecium oxycladon* (Brid.) J. & S., which are given in Savage's list, are omitted in the later paper.

Thuidium gracile B. & S. is given as *T. virginianum* (Brid.) Lindl., which is a synonym for *T. gracile* var. *lancastriensis* S. & L.; but Savage did not have the variety, and this form should appear under the name *T. microphyllum* (Sw.) Best

Pylaisia intricata B. & S. is given as *P. intricata* (Hedw.) R. & C., apparently simply by changing the author's name. *P. intri-*

³ Grout, A. J. *Moss Flora of N. Am.*, vol. III, part I, p. 5; 1928.

⁴ Blogg, Betty. *Preliminary List of Iowa Mosses*. Proc. Ia. Acad. Sci., vol. XXXIV, pp. 125-132; dated 1927, but published in 1929.

⁵ Savage, T. E. *A preliminary List of the Mosses of Iowa*. Proc. Ia. Acad. Sci., vol. VI, pp. 154-164; 1899.

cata B. & S., as reported by Savage, should appear as *P. Schimperi* R. & C.

In this and a subsequent paper ⁷ the same author reported these species, with the exception of *Pylaisia Schimperi*, as new to the state. In the former list Dr. Savage is also credited with *Rhodobryum roseum* (Weis.) Limpr., but this species, though rather common in Iowa, is found neither in his list, nor in his collection which is deposited in the Herbarium of the State University.

In a recent paper ⁶ the writer reported *Bryhnia novae-angliae* Sull. & Lesq. as new to the state. This species appears in a paper published by Miss Blagg,⁷ which was not available at the time the writer's list was sent in because of the unfortunate delay in the publication of the Proceedings of the Academy.

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POLYEMBRYONY IN ALFALFA AND SWEET CLOVER

JOHN R. WATT AND J. N. MARTIN

In the germination tests of alfalfa seed in the spring of 1930, one seed was discovered with two embryos. They were both normal in all structures, equal in size and behaved normally in germination. Multiple embryo sacs in the ovules of alfalfa are frequent, but it has been supposed that not more than one is able to mature and function. The presence of two embryos is evidence that two embryo sacs may mature and function.

In biennial white sweet clover, one ovule was found with a normal embryo and a second structure much smaller but resembling an embryo in early stage of development. The normal embryo was about two-thirds mature with cotyledons, hypocotyl, and radicle differentiated. The second embryo-like structure was borne on well defined suspensor but no parts were differentiated. It occupied a region enclosed by a membrane which was separate from but in contact on one side with the normal embryo sac. Here we have evidence of the occurrence and functioning of more than one embryo sac in sweet clover, which, like alfalfa, is also irregular in number of embryo sacs occurring in an ovule.

IOWA STATE COLLEGE,
AMES, IOWA.

⁶ Cavanagh, Lucy M. *The Bryologist*, vol. XXXII, pp. 112-113; Nov., 1929.
⁷ Blagg, Betty. *Proc. Ia. Acad. Sci.*, vol. XXXV, pp. 113-116; dated 1928, but published nearly two years later.