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A Preliminary Survey of the Lichens of Central Iowa¹

Abstract. Seventeen species collected since 1958 are listed and described. These are *Amphiloma lanuginosum*, *Cladonia cariosa*, *C. furcata*, *C. mitrula*, *C. pyxidata*, *Collema furvum*, *Graphis scripta*, *Parmelia borneri*, *P. crinita*, *P. reducta*, *Peltigera canina*, *Pertusaria multipuncta*, *Physcia adglutinata*, *P. pulverulenta*, *P. stellaris*, *Teloschistes candelarius*, and *Trimmatothele umbellulariae*.

KAREN JUHL²

Little work has been done with the lichen flora of Iowa since the late 1880's, when Dr. Bruce Fink collected extensively in Fayette County. It is interesting to note that few lichen specimens in the Iowa State University Herbarium have been collected since 1900. Many of these collections and identifications were made by Dr. Fink, W. G. Farlow, Clara E. Cummings, W. W. Calkins, and A. B. Seymour—all pioneers in American lichenology. Perhaps one of the reasons students hesitate to study lichens at the present time is the lack of keys, particularly those that can be used by beginners.

Monographic treatments of North American genera and families of lichens published within the last twenty years have changed the positions of many species. The synonyms are not clear in all cases, and more modern treatments for the complete group of lichens are not available. Thus, for the purposes of this paper, the names used are those in Fink's *Lichen Flora of the United States* (2).

This preliminary report will be limited to a consideration of lichens collected during the past several years in the central portion of the state. The majority of these collections were made during the summer of 1960. The northern border of the collecting area was Clear Lake; the southernmost collections were made at Grand River.

The species treated are listed in alphabetical order, with no attempts made to group them into families.

Amphiloma lanuginosum (Hoffm.) Nyl.

Thallus light greenish gray; a mealy, soredioid mass with no differentiation into layers; apothecia unknown.

On wood, Ledges State Park, June 14, 1960, K. Juhl.

This lichen is far more widespread than is indicated by the single collection.

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Cladonia cariosa (Ach.) Spreng.

Primary thallus persistent, composed of grayish-green ascending squamules; whitish and sorediate below, brownish toward the base; podetia arising from the primary thallus, subcylindrical, sorediate, becoming laterally grooved and fissured, clustered or subsolitary, usually suberect, cupless, the cortex subcontinuous or areolate, the areoles frequently scattered, pale greenish-gray to whitish; apothecia middle sized to large, 1-3 mm in diameter, clustered to conglomerate, the disk flat to convex, brown or rarely reddish brown.

On earth or old wood, Ledges State Park, June 2, 1959, Lois H. Tiffany.

In this collection the podetia are less than 1 cm long; the apothecia, 1-1.5 mm across. According to Fink (1), Iowa is the southern limit of this species.

Cladonia furcata (Huds.) Schrad.

Primary thallus rarely persistent, composed of greenish-gray to brownish or whitish squamules; white below; podetia arising from the primary thallus, cylindrical or subcylindrical, the lower part sometimes dying, rarely squamulose toward the base, rarely cup bearing, dichotomously or frequently radiately branched, erect or rarely prostrate or decumbent, rarely somewhat sorediate, the cortex continuous or more or less dispersed, colored like the primary thallus; apothecia small to middle sized, 0.5-1.5 cm in diameter, irregular or cymosely born on the apices of branches, the disk convex, brown to brick red or lighter.

On soil, Ledges State Park, April 4, 1959, K. Juhl; Woodman Hollow State Park, July 30, 1960, K. Juhl; Ledges State Park, Mar. 31, 1961, G. Moorehead.

The collections show much variation in the amount of branching and the presence of squamules on the podetia. *C. furcata* often forms rounded, shrubby clumps six inches or more in diameter.

Cladonia mitrula Tuck.

Primary thallus commonly persistent, composed of ashy to greenish-gray squamules; white below; podetia arising from the primary thallus, cylindrical, cupless, always terminated by apothecia, somewhat branched toward the apex, the branches suberect and spreading, the sides sometimes fissured, the axils sometimes open, subsolitary to crowded, erect, the cortex continuous or composed of contiguous areoles, rarely in part decorticate and sorediate, sometimes more or less squamulose, colored like the primary thallus; apothecia small to middle sized, 0.5-2 cm in diameter, sometimes perforate, solitary or clustered on the apices of podetia and branches, the disk flat to convex, brown to lighter or reddish brown.

C. mitrula is close to *C. cariosa*, differing in the lack of deep grooves in the podetium, and the spreading, fan-shaped apex of the podetium. The podetia of *C. mitrula* were less than 1 cm long and 2-4 mm in diameter at the apex. Fink (1) states that Iowa is the northern limit of this species.

Gladonia pyxidata (L.) Hoffm.

Primary thallus commonly persistent, composed of greenish-gray to whitish ascending squamules; lighter and sorediate below; podetia arising from the primary thallus, cup shaped and often hollow, erect, closely clustered, the cortex areolate or verrucose or subcontinuous toward the base, sometimes decorticate and sorediate toward the top, rarely more or less squamulose, greenish-gray to ashy or olive green; cups regular or irregular, gradually or abruptly dilated, the cavity sorediate or corticate, the margin dentate or proliferate; apothecia middle sized, 1-4 mm in diameter, solitary to conglomerate, sessile or shortly stalked on the margin of the cups, the disk flat to convex, brown.

On soil or rotten wood, Woodman Hollow State Park, Sept., 1958, K. Juhl; Ledges State Park, April 4, 1959, K. Juhl; Woodman Hollow State Park, May 11, 1959, K. Juhl; Ledges State Park, June 2, 1959, L. H. Tiffany; Ledges State Park, June 13, 1960, K. Juhl; Barkley State Park, June 17, 1960, K. Juhl.

Apothecia were reduced to very small brownish proliferations along the rims of the cups. In one collection, the primary cups were found to bear secondary cups from their edges. In all other characters, however, the specimen agrees with the description of *C. pyxidata*.

Collema furvum (Ach.) DC.

Transforming the algal colony into a middle sized, rather thin, lobed and folded, olive green to blackish, dorsally granulose body, the lobes round to somewhat irregular, ascending, oblong, with entire to crenulate, deeply wavy margins; apothecia small to middle sized, 0.3-1 mm in diameter, scattered or loosely clustered, the disk concave to flat, brown, the algoid exciple prominent; hypothecium brownish; spores ovoid-ellipsoid, 3-septate transversely and 1-septate longitudinally, 17-24 x 9-11 microns.

Algal host is *Nostoc* sp.

On rocks, Ledges State Park, April 1, 1960, Diana B. Lewiston.

This specimen was densely covered with granules. The thallus was olive green and gelatinous when moist, blackish when dry.

Graphis scripta (L.) Ach.

Thallus thin, smooth to obscurely rough or wrinkled, greenish-gray to whitish, yellowish, or olive green; apothecia long and narrow, 1-5 or more x 0.12-0.25 mm, immersed to partly immersed, straight to curved and flexuous, infrequently 1 or 2

times branched, the disk closed to open and sordid black or grayish pruinose, the exciple black and covered laterally by a thin, rarely disappearing, thalloid one; hypothecium hyaline; spores long-ellipsoid, 5-11-septate, 20-50 x 6.5-12 microns.

On trees, Ledges State Park, June 14, 1960, K. Juhl; Pammel State Park, June 22, 1960, K. Juhl; Call State Park, Aug. 15, 1960, K. Juhl.

The apothecia in these collections were quite crowded, and did not attain the maximum length indicated in the description of this species.

Parmelia borrieri Turn.

Thallus middle sized or larger, usually wrinkled, rather closely adnate, greenish-gray or varying toward ashy or brownish, sometimes covered more or less by round soredia, the lobes rather wide and short, more or less branched, with usual cut-crenate margins; ashy to pale brownish, or very rarely blackening below, with white or darkening rhizoids; apothecia middle sized to large, 3-14 mm in diameter, subsessile, the disk concave to deeply concave, chestnut brown, the exciple entire to crenate or irregular; spores ellipsoid, 9-18 x 6-8 microns.

On trees, Clear Lake, June 28, 1960, K. Juhl; Ledges State Park, Feb. 26, 1961, K. Juhl.

The thallus in these collections was bluish green rather than the color range indicated in the description. The lower surface of the thallus is darker in the older plants. This seems to be true of some other species also, especially species of *Parmelia* and *Physcia*.

Parmelia crinita Ach.

Thallus becoming large, rather loosely adnate, lighter to darker greenish-gray, densely covered with granules or coralloid branchlets, the broad, wrinkled lobes often ascending slightly, with inconspicuously ciliate, irregular or crenate margins; black below and clothed with strong rhizoids of the same color, often brown toward the margins; apothecia rare, subpedicellate, small to middle sized, 4-12 mm in diameter, the disk deeply concave, chestnut brown, the exciple irregular or crenate, sometimes bearing cilia or coralloid branchlets; spores ellipsoid, 17-22 x 9-15 microns.

On trees, Call State Park, Aug. 15, 1960, K. Juhl.

Parmelia reducta Ach.

Thallus middle sized to large, rather closely adnate, greenish-gray to ashy, commonly wrinkled, bearing many granules or coralloid branchlets, the lobes wide and short, somewhat branched, the margins entire to cut-crenate, and rarely white powdery; ashy to pale brown below with white or darkening rhizoids;

apothecia rare, small, 3-5 mm in diameter, subsessile, the disk deeply concave, chestnut brown, the exciple entire, crenulate, or irregular; spores ellipsoid, 10-16 x 6-8.5 microns.

On trees, Grand River, July 14, 1960, W. G. Bennett; Call State Park, Aug. 15, 1960, K. Juhl.

The collection from Grand River varied from the above description in that it was a dilute green in color, densely covered with coralloid branchlets; and proliferations resembling coralloid branchlets extended from the thalloid exciple.

Peltigera canina (L.) Willd.

Thallus middle sized to large, closely adnate, greenish-gray to ashy and brownish, with broad ascending lobes, and round to irregular or crenate margins, partly covered with trichomatic hyphae; whitish below or rarely brownish toward the center, bearing many whitish to darkening veins and rhizoids; apothecia middle sized to large, 4-8 mm in diameter, borne on extended, suberect lobules, round to commonly rolled backward, the disk reddish to dark brown, the exciple sometimes becoming crenulate or irregular; hypothecium brownish; spores hyaline, 5-7 septate, acicular, sometimes curved, 38-72 x 3-5 microns.

On soil and over mosses, Barkley State Park, June 17, 1960, Keturah A. Gashwiler; Woodman Hollow State Park, July 30, 1960, K. Juhl.

The color of the thallus and the size of the lobes seem to be quite variable within a given collection. These characters have been used in part to separate this species into varieties, but the variation within the material here reported is such that varietal distinctions do not seem to be meaningful.

Pertusaria multipuncta (Turn.) Nyl.

Thallus thin, smooth to chinky or warty-areolate, greenish gray to pale ashy; apothecia small to middle sized, 0.3-0.6 mm in diameter, 1-several immersed in each wartlike elevation, with a minute, depressed, blackened ostiole or becoming open with a flat, pale to blackish disk and thin, irregular exciple, the apothecia finally passing into powdery sorediate heaps; spores 1 or rarely 2, ellipsoid to oblong-ellipsoid, 75-170 x 25-65 microns.

On trees, Pammel State Park, June 22, 1960, K. Juhl.

This specimen had two spores per ascus.

Physcia adglutinata (Floerke) Nyl.

Thallus small, foliose, closely adnate to adglutinate, greenish-gray varying toward ashy or brownish, the lobes usually long and branched with entire to crenulate margins, finally passing toward the center into a granular crust; whitish below or sometimes darker, rarely bearing scattered rhizoids; apothecia minute to small, 0.4-1.75 mm in diameter, sessile, the disk flat, blackish

brown, the exciple entire to subcrenulate, scarcely ciliate; spores oblong to ellipsoid, 13-22 x 7-10 microns.

On trees, Clear Lake, June 28, 1960, K. Juhl.

Physcia pulverulenta (Schreb.) Nyl.

Thallus usually middle sized to large, adnate, greenish-gray to brown, usually completely or interruptedly white-pruinose, the lobes narrow, sometimes elongated, somewhat branched, the margins entire, crenate or rarely lobulate, sometimes ascending and powdery; brownish black to black below, lighter toward the margins, with numerous brown to black rhizoids; apothecia rare, small to middle sized, 2.5-5 mm in diameter, sessile, the disk concave to flat, whitish pruinose to dark brown, the exciple entire, crenate, or irregularly lobed; spores oblong-ellipsoid, 23-40 x 12-20 microns.

On trees, Barkley State Park, June 17, 1960, K. Juhl; Call State Park, Aug. 15, 1960, K. Juhl.

Physcia stellaris (L.) Nyl.

Thallus middle sized, adnate, greenish-gray to whitish or brownish, the lobes rather narrow, frequently elongated, much branched, sometimes imbricated, the margins entire to crenate, often passing centrally into a crust; white below with white rhizoids, or sometimes becoming darker to black with rhizoids of the same dark color; apothecia small, 2-4 mm in diameter, sessile, the disk slightly concave to convex, whitish pruinose to dark brown or black, the exciple entire to crenate; spores oblong-ellipsoid, 14-24 x 8-11 microns.

On trees, Barkley State Park, June 17, 1960, K. Juhl; Clear Lake, June 28, 1960, K. Juhl; Kossuth Co., July 14, 1960, K. Juhl; Call State Park, Aug. 15, 1960, K. Juhl; Lake Ahquabi, Oct. 2, 1960, Marjorie Christianson; Ledges State Park, Feb. 26, 1961, K. Juhl; Ames, March 25, 1961, K. Juhl.

Teloschistes candelarius (L.) Fink

Thallus middle sized, round to irregular, greenish-yellow or orange, composed of rather broad, more or less imbricated, sparingly branched, somewhat ascending, marginally coralloid or granulose lobes; yellowish to ashy below, bearing many ashy yellow rhizoids and marginal fibrils; apothecia small to middle sized, 1-4 mm in diameter, subsessile, rarely fibrillose below, the disk concave to flat, orange or reddish orange, the exciple thin, colored like the thallus, becoming crenulate, coralloid or granulose; hypothecium hyaline; spores ellipsoid, 12-17 x 5.5-9 microns.

On trees, Call State Park, Aug. 15, 1960, K. Juhl.

Thompson (3) calls this species *Xanthoria candelaria* var. *finmarkica*. The thallus and apothecia become red-purple in color when treated with potassium hydroxide.

Trimmatothele umbellulariae Herre

Superficial thallus very thin, widespread, dusky gray; perithecia

minute to small, 0.1-0.3 mm in diameter, partly immersed, the superficial portion black, hemispherical to conical, the ostiole obscure; hypothecium hyaline; spores ovoid to short-ellipsoid, 2.5-3 x 2-2.5 microns.

On trees, Call State Park, Aug. 15, 1960, K. Juhl.

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