KEY TO THE FAMILIES OF OHIO LICHENS.

J. C. HAMBLETON.

1. Fruiting thallus with apothecia or perithecia containing asci; Ascomycetes living symbiotically with algae. ASCOLICHENES. 2.
1. Fruiting thallus not with apothecia nor perithecia; spores produced on basidia; Basidiomycetes living symbiotically with algae. BASIDIOLICHENES. 3.
2. Fruiting body an apothecium. DISCOLICHENES. 4.
2. Fruiting body a perithecium. PYRENOLICHENES. 23.
3. Hymenium on an exposed surface. (none in our territory. HYMENOLICHENES.
3. Hymenium lining closed cavities (none in our territory). GASTROLICHENES.
4. Paraphyses forming a powdery mass with the spores; disc of apothecium more or less open. The paraphyses growing beyond the asci forming there a network, adhering to the disc of the apothecium which soon breaks up into a powdery mass with the spores; Algae belonging to the Chlorophyceae. CONYOCARPALES. 5.
4. Paraphyses not forming a powdery mass with the spores. 6.
5. Apothecia borne on a stipe, exciple without algae; thallus crustaceous or hypophloedal, without cortical layer CALICIACEAE.
5. Apothecia sessile; exciple with algae. CYPHELIACEAE.
6. Disc of apothecium lineal, elipsoid, or somewhat angular; algae belonging to Chlorophyceae. GRAPHIDALES. 7.
6. Disc of apothecium circular. Algae belonging Chlorophyceae or Cyanophyceae. CYCLOCARPALES. 8.
7. Apothecia without border. ARTHONIACEAE.
7. Apothecia with border. GRAPHIDACEAE.
8. Spores uniseptate. 9.
8. Spores one-celled, multiseptate, or muriform, colorless or sometimes brownish; cell walls always thin. 11.
9. Spores colorless; thallus foliose or fruitcose, with cortical layer. THELOSCHISTACEAE.
9. Spores brown or dark. 10.
10. Thallus foliose or furticose, with cortical layer; pycnidia endobasidial. PHYSIACEAE.

10. Thallus crustaceous, ovate or lobed at the border, without cortical layer; pycnidia exobasidial. BUELLIACEAE.
11. Thallus when moist, more or less gelatinous, usually unstratified, scaly, foliose or fruticose, seldom crustaceous; apothecia sessile; alga a Nostoc. COLLEMACEAE.
11. Thallus when moist not gelatinous nor swollen. 12.
12. Thallus crustaceous, border lobed, horizontal. 13.
12. Thallus squamulose or foliose, horizontal or with border elevated; fastened to the substratum with rhizoids or umbilicus; pseudoparenchymatous throughout, or with cortical layer above or on both sides. 19.
12. Thallus cylindrical or fruitcose, upright or pendant; fastened to substratum with an anchor disc, or dying off from the ground growing radially; entirely covered with cortical layer. USNEACEAE.
13. Thallus with algae belonging to Chroolepus or Phylactidium. 14.
13. Thallus with algae belonging to Pleurococcus or Palmella. 15.
14. Exciple usually without algae, rarely rudimentary or wanting. LECANACTIDACEAE.
14. Exciple with algae always present; apothecia single or in groups sunken in thalline warts. THELOTREMACEAE.
15. Ascus one to eight spored, seldom sixteen to thirty-two; apothecia with distinct border or margin. 16,
15. Ascus many spored. ACAROSPORACEAE.
16. Exciple without algae. 17.
16. Exciple with algae; apothecia lecanorine. 18.
17. Apothecia sessile. LECIDEACEAE.
17. Apothecia borne on a stipe. CLADONIACEAE.
18. Apothecia sessile; border distinct. LECANORACEAE.
18. Apothecia single or in gropus, sunken in thalline warts; border usually very small. PERTUSARIACEAE.
19. Apothecia in young stage or always with the entire under side buried in the thallus; without margin, or bordered with the remains of the old covering. PELTIGERACEAE.
19. Apothecia on well defined stipes which are often strongly expanded and branched; naked or covered with thalline scales. CLADONIACEAE.
19. Apothecia sessile or short stalked; margin distinct. 20.
20. Interior hyphal layer wanting or indistinct; thallus entirely or in great part pseudoparenchymatous, with algae belonging Scytonema; pycnidia exobasidial. HEPPIACEAE.
20. Interior hyphal layer distinct in the well stratified thallus. 21.
21. Spores more or less spindle form, multiseptate, colorless or brownish; under side of thallus with abundant cyphellae or pseudocyphellae. STICTACEAE.
21. Spores ovate ellipsoid, or long ovate, one-celled (by exception two-celled), or muriform, in which latter case they are dark colored; cyphellae never present. 22.
22. Thallus with algae belonging to Scytonema. PANNARIACEAE.
22. Thallus always with algae belonging to Pleurococcus or Palmella apothecia sessile with algae in exciple. PARMELIACEAE.
23. Cavity of perichecium simple; not divided by complete or incomplete partitions. 24.
23. Cavity of pertithcium divided by complete or incomplete partitions; algae, Palmella or Chroolepus. MYCOPORACEAE.
24. Thallus foliose or scaly, with cortical layer on both sides or on upper side only; algae Pleurococcus of Palmella. DERMATOCARPACEAE.
24. Thallus crustaceous, without cortical layer or with amorphous cortex made up of horizontal hyphae. 25.

25. Perithecia inclined or horizontal, the ostioles usually opening into a common canal; situated in a stroma; algal cells Chroolepus. ASTROTHELIACEAE.
25. Perithecia erect with a single ostiole at the summit. 26.
26. Perithecia in a stroma; algal cells belonging to Chroolepus. TRYPETHELIACEAE.
26. Perithecia single; storma wanting. 27.
27. Spores one-celled (in our species); algae belonging to Pleurococcus or Palmella. VERUCARIACEAE.
27. Spores one to multiseptate (in our species); algal cells belonging to Chroolepus. PYRENULACEAE.