

Hepatophyta and Anthocerotophyta of Alabama I. Preliminary Studies.

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The liverwort and hornwort flora of Alabama is poorly known and published reports are few and scattered. The first collections indicated by herbarium studies are from the late 1800's. The first attempt to enumerate the liverwort and hornwort flora for the state was by Mohr (1901) as part of an effort by the State Geological Survey to report all plants, both vascular and nonvascular, for Alabama. In this survey, Mohr (1901) reported 43 species of liverworts and four species of hornworts. Several of these have undergone synonymy or nomenclatural changes since Mohr's publication. Briel (1970) studied the liverworts and hornworts of the Mid-Gulf Coastal Plain that included Barbour, Henry, Dale, Geneva, and Houston counties in southeastern Alabama. The results of this study included two species of hornworts and 48 species of liverworts. Schuster's (1969-1980, 1992) *magnus opus* on the hepatic and hornwort flora found east of the hundredth meridian in North America reports 63 taxa for the state. No extensive study of the two groups for the state has been attempted. This study provides a preliminary checklist of the hepatic and hornwort flora for Alabama. The checklist is the result of field work by the authors, literature review, and herbarium studies. An asterisk indicates a new record for the state.

Alabama is an ecologically diverse state lying between 30°31' N and 35°00' N latitude. The northern half of the state is a complexity of mountains resulting in a wide range of geologic features. These mountains reach a maximum height of 824 meters above sea level. The southern half of the state is characterized by a variety of habitats, including savanna, prairie, swamp, pine woodlands, and hardwood forests. The topography is rolling hills and shallow to deep ravines grading into coast land in the south. Maximum height of topography near the coast is 91 meters. Three miles off the coast is an approximately 22 kilometer barrier island that is vegetated on the eastern side and vegetation bare on the western side. The state is drained by a diverse system of rivers and smaller streams. The most significant are the Tennessee and Coosa in the north and the Alabama, Tombigbee, and Chattahoochee in the southern half. The climate in Alabama is subtropical at the southern limit and mild temperate in the north.

The following is an initial alphabetical list of species within family, based in part on Schuster (1969-1980, 1992) and Stotler and Crandall-Stotler (1977). Families are arranged phylogenetically within the Hepatophyta. Each entry includes a list of counties where it has been collected. Collector(s) and collection numbers or

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literature reference follow the counties. A collector's name and number following each county represents a collected specimen and names in parentheses represents a literature report. Specimens are deposited in KSP, UNA, UNAF, FLAS, FSU,

The below list represents an initial effort to catalog the state's liverwort and hornwort flora. A total of 91 taxa representing 25 families are reported here. The Lejeuneaceae contains the largest number of taxa, 19 species (21% of the reported flora) and the genus *Frullania* contains the largest number of species, 9 (10% of the reported flora). The "leafy" liverworts constitutes the greatest number of taxa with 66. Continued field work of Alabama's diverse habitats will undoubtedly result in new species for the state and new county records of many of those listed here.

ANTHOCEROTOPHYTA (Hornworts)

ANTHOCEROTACEAE

Anthoceros laevis ssp. *carolinanus* (L.) Schust. - Coffee, Colbert, Dale, Franklin, Geneva, Houston, Lawrence, Mobile, Monroe, Pike, Tuscaloosa, Wilcox. *Timme* 9319.

Aspiromitus adscendens (L. & L.) Schust. - Mobile (in Mohr as *A. ravenellii* Aust.).

A. punctatus ssp. *agrestis* var. *agrestis* (Paton) Schust. - Calhoun, Mobile (in Mohr 1901 as *Anthoceros punctatus* L.).

Notothylas orbicularis (Schwein.) Sull. - Coffee, Colbert. *Timme & Bowers* 9305.

HEPATOPHYTA (Liverworts)

PSEUDOLEPICOLEACEAE

Blepharostoma trichophyllum (L.) Dum. - Walker. *Timme* 9033.

TRICHOCOLEACEAE

Trichocolea tomentella (Ehrh.) Dum. - Cherokee, Colbert, Dale, Etowah, Franklin, Lauderdale, Lawrence, Wilcox, Winston, *Timme* 10737. Probably more widespread in the state than indicated here.

LEPIDOZIACEAE

Bazzania trilobata (L.) S. Gray - Colbert, Cleburne, Conecuh, Dekalb, Franklin, Jackson, Lawrence, Marion, Mobile, Tuscaloosa, Walker, Winston. *Timme* 9128. Probably more widespread in the state than indicated here.

Microlepidozia sylvatica (Evans) Joerg. - Colbert, Dekalb, Franklin, Jackson, Lawrence, Marion, Mobile, Monroe. (Sullivant 1846).

Telaranea nematodes (Gott.) Howe - Houston, Jackson, Monroe, Winston. *Timme* 9090.

CALYPOGEJACEAE

Calypogeja fissa subsp. *neogaea* Schust. - Cherokee, Chilton, Colbert, Conecuh, Crenshaw, Dale, Dekalb, Etowah, Franklin, Houston, Jackson, Lauderdale, Lawrence, Marion, Mobile, Walker, Winston. *Timme* 6471.

C. muelleriana (Schiffn.) K. Müll. subsp. *muelleriana* - Cullman, Franklin, Lawrence, Limestone. *Timme* 8969.

C. peruviana Nees & Mont. - Franklin, Lawrence. *Timme & Bowers* 8909.

C. sullivantii Aust. - Cherokee, Colbert, Cullman, Etowah, Fayette, Franklin, Jackson, Jefferson, Lauderdale, Lawrence, Marion, Mobile, Winston. *Davison* 2102

CEPHALOZIACEAE

Cephalozia bicuspidata (L.) Dum. - Franklin, Jackson, Lawrence, Marion, Winston. *Timme* 9091.

C. catenulata (Huben.) Lindb. - Bibb, Coffee, Colbert, Conecuh, Dekalb, Franklin, Lawrence, Lee, Mobile, Tuscaloosa, Wilcox. *Timme* 9360.

C. connivens (Dicks.) Lindb. - Franklin, Jackson, Lauderdale, Lee, Marion, Monroe, Winston. *Timme* 8912.

C. lunulifolia (Dum.) Dum. - Coffee, Franklin, Jackson, Lawrence, Lee, Marion, Mobile, Monroe, Tuscaloosa, Walker, Winston. *Timme* 9321.

Nowellia curvifolia (Dicks.) Mitt. - Cherokee, Etowah, Franklin, Jackson, Lawrence, Limestone, Tuscaloosa. *Timme* 9142.

ADELANTHACEAE

Odontoschima denudatum (Nees ex Mart.) Dum. var. *denudatum* - Cherokee, Etowah, Jackson, Lawrence, Lee, Marion, Mobile. *Davison* 3195.

O. prostratum (Sw.) Trev. - Barbour, Coffee, Colbert, Conecuh, Cullman, Dekalb, Franklin, Jackson, Lauderdale, Lawrence, Lee, Marion, Mobile, Monroe, St. Clair, Walker, Winston, Wilcox. *Timme* 9549. Probably more widespread in the state than indicated here.

LOPHOCOLEACEAE (nomenclature for *Chiloscyphus* see Engel & Schuster 1984)

Chiloscyphus apalachicolus (Schust.) Engel & Schust. - Dale (Schuster 1980).

C. pallescens (Ehrh. ex Hoffm.) Dum. - Cherokee, Conecuh, Dale Etowah, Lauderdale, Wilcox. (Breil 1970).

C. profundus (Nees) Engel & Schust. - Colbert, Etowah, Fayette, Franklin, Jackson, Lauderdale, Limestone, Marion, Monroe, Walker

CEPHALOZIACEAE

Cephaloziella hampeana (Nees) Schiffn. ex Loeske - Walker. *Timme* 9032.

C. hyalina Douin - Chilton, Coffee, Conecuh, Dekalb, Lauderdale, Marion, Tallapoosa, Tuscaloosa, Walker, Winston. *Timme & Bowers* 9325.

C. rubella (Nees) Warnst. var. *rubella* - Marion (Schuster 1980).

PLAGIOCHILACEAE

Plagiochila asplenoides subsp. *porelloides* (Torr. ex Nees) Schust. - Colbert, Cullman, Dekalb, Franklin, Jackson, Lauderdale, Lawrence, Marion, Mobile, Winston. *Timme 10722*. Probably more widespread in the state than indicated here.

P. dubia Lindenb. & Gott. - Dale. (Breil 1970).

P. ludoviciana Sull. - Geneva, Lawrence, Houston, Mobile. *Davison 1942*.

JUNGERMANNIACEAE

Jungermannia lanceolata L. - Morgan (Schuster 1969).

Solenostoma gracillimum (Smith) Schust. - Lee (Schuster 1969).

S. hyalinum (Lyell in Hook.) Mitt. - Lee (Evans 1919).

SCAPANIACEAE

Diplophyllum apiculatum (Evans) Steph. var. *apiculatum* - Cherokee, Cullman, Dekalb, Franklin, Jackson, Lawrence, Marion, Winston. *Timme 10738*.

Scapania nemorosa (L.) Dum. - Barbour, Bill, Cherokee, Chilton, Coffee, Colbert, Conecuh, Coosa, Crenshaw, Cullman, Dale, Dekalb, Elmore, Etowah, Fayette, Franklin, Houston, Jackson, Lauderdale, Lawrence, Lee, Mobile, Marion, Monroe, Randolph, St. Clair, Tallapoosa, Walker, Winston. *Timme 10724*. Probably in every county.

RADULACEAE

Radula australis Aust. - Baldwin, Conecuh, Dekalb, Marion, Tuscaloosa. *Timme 8721*.

R. floridana Castle - Mobile (Schuster 1980). In Briel 1970 as *R. sullivantii* for Dale and Houston Counties.

R. mollis Lindenb. & Gott. - Cherokee, Cleburne, Conecuh, Dekalb, Geneva, Houston, Jackson, Lawrence. *Davison 2064*.

R. obconica Sull. - Cherokee, Colbert, Coosa, Dale, Etowah, Franklin, Houston, Jackson, Lauderdale, Lawrence, Marion, St. Clair, Winston. *Timme 10740*.

R. tenax Lindb. - Cullman, Franklin. *Timme & Bowers 9143*.

PORELLACEAE

Porella pinnata L. Baldwin, Bibb, Calhoun, Cherokee, Colbert, Conecuh, Dale, Dekalb, Etowah, Greene, Houston, Jackson, Jefferson, Lauderdale, Lawrence, Limestone, Marshall, Mobile, Monroe, Pickens, St. Clair, Tuscaloosa, Walker. *Timme 9024*. Probably in every county.

P. platyphylla (L.) Pfeiff. Calhoun, Cherokee, Clebourne, Colbert, Conecuh, Elmore, Etowah, Jackson, Jefferson, Lauderdale, Lawrence, Limestone. *Timme & Bowers 6747*. We have included the once recognized *P. platyphylloidea* (Schwein.) Lindb. under *P. platyphylla* from evidence presented by Therrien, Crandall-Stotler and Stotler (1998).

JUBULACEAE

Frullania brittoniae Evans - Houston, Lawrence, Marion, Tuscaloosa. *Timme 8641*.

- F. donnellii* Aust. - Marion, Mobile. *Timme* 8713.
- F. eboracensis* Gott. - Chilton, Colbert, Conecuh, Franklin, Lawrence, Houston, Tuscaloosa, Walker. *Timme* 8960.
- F. ericoides* (Nees) Mont. - Barbour, Chilton, Clay, Coffee, Colbert, Conecuh, Cossa, Cullman, Dale, Etowah, Fayette, Franklin, Houston, Jackson, Jefferson, Lauderdale, Lawrence, Limestone, Marion, Mobile, Tallapoosa, Walker, Winston. *Timme* 9356. Probably in every county.
- F. inflata* Gott. Bibb, Celeburne, Colbert, Conecuh, Dekalb, Etowah, Fayette, Franklin, Houston, Jackson, Lauderdale, Lawrence, Limestone, Montgomery, Tuscaloosa, Walker. *Timme* 9356. Probably in every county.
- F. kunzei* Lehm. & Lindenb. - Coffee, Colbert, Conecuh, Etowah, Franklin, Geneva, Jackson, Lawrence, Marion, Mobile, Monroe, St. Clair, Winston. *Timme* 9365.
- F. obcordata* Lehm. & Lindenb. - Coffee, Conecuh, Dale, Franklin, Houston, Lawrence, Marion, Mobile, Monroe. *Timme* 9263.
- F. riparia* Hampe - Mobile (in Mohr 1901 as *F. aeolotis* Nees).
- F. tamarisci* subsp. *asagrayana* (Mont.) Hatt. - Bibb, Colbert, Dekalb, Etowah, Franklin, Jackson, Lawrence, Marion, St. Clair, Tuscaloosa, Winston. *Timme* 8900.
- Jubula pennsylvanica* (Steph.) Evans - Cherokee, Colbert, Cullman, Dale, Dekalb, Elmore, Franklin, Jackson, Lauderdale, Lawrence, Marion, Tuscaloosa, St. Clair, Winston. *Timme* 9087.
- LEJEUNEACEAE**
- Cheilolejeunea clausa* (Nees et Mont.) Schust. - Bibb, Mobile, Tuscaloosa. *Bowers* 12010.
- C. myriantha* (Nees & Mont.) Schust. - Baldwin, Mobile (Schuster 1980).
- C. rigidula* (Mont.) Schust. - Butler, Conecuh, Coosa, Dale, Escambia, Geneva, Houston, Mobile. *Timme* 9345.
- Cololejeunea biddlecomiae* (Aust.) Evans - Cherokee, Colbert, Etowah, Jackson, Jefferson, Lauderdale, Lawrence, Limestone, Mobile, Walker, Winston. *Timme* 9044.
- C. cardiocarpa* (Mont.) Schust. - Geneva, Lauderdale, Lawrence, Monroe, Mobile, Tuscaloosa. *Timme* 6582.
- C. minutissima* (Smith) Schiffn. subsp. *minutissima* - Baldwin. (Schuster 1980).
- C. setiloba* Evans - Geneva. (Breil 1970).
- Lejeunea calcicola* Schuster. var. *calcicola* - Conecuh, Dale. (Breil 1970).
- L. cladogyna* Evans - Bibb, Butler, Coffee, Conecuh, Coosa, Dale, Houston, Walker. *Timme* 9274.
- L. flava* (Sw.) Nees - Bibb, Butler, Coffee, Cullman, Dale, Franklin, Geneva, Houston, Jefferson, Mobile, Pike, Russell, Walker. *Timme & Bowers* 9296.
- L. floridana* Evans - Dale. (Breil 1970).

- L. laetivirens* Nees et Mont. - Colbert, Cullman, Dale, Dekalb, Escambia, Etowah, Geneva, Jackson, Lawrence, Mobile, Walker, Winston. *Timme* 10742.
- L. ulicina* subsp. *bullata* (Tayl.) Schust. - Mobile. (Schuster 1980).
- Leucolejeunea clypeata* (Schwein.) Evans - Butler, Cherokee, Chilton, Coffee, Colbert, Coosa, Cullman, Dale, Dekalb, Etowah, Fayette, Franklin, Geneva, Jackson, Jefferson, Lauderdale, Lawrence, Limstone, Marshall, Marion, Mobile, Monroe, St. Clair, Tallapoosa, Walker, Winston. *Timme* 10746. Probably in every county.
- L. conchifolia* Evans - Conecuh, Cullman, Franklin, Jackson, Lawrence, Marion, St. Clair. *Timme* 8647.
- L. uncioloba* (Lindenb.) Evans - Barbour, Bibb, Butler, Cleburne, Colbert, Conecuh, Etowah, Franklin, Houston, Jackson, Lawrence, Limestone, Monroe, St. Clair. *Timme* 9123.
- L. xanthocarpa* (Lehm. et Lindenb.) Evans - Mobile.
- Mastigolejeunea auriculata* (Wils. et Hook.) Schiffn. - Mobile, Wilcox. (in Mohr 1901 as *Lejeunea auriculata* Hook. & Wils.).
- Rectolejeunea maxonii* Evans - Barbour, Cherokee, Chilton, Colbert, Conecuh, Etowah, Jackson, Jefferson, Lawrence, Marion, Mobile, Walker, Winston. *Timme* 9053.

CODONIACEAE

- Pallavicinia lyelii* (Hook.) Gray - Baldwin, Bibb, Cherokee, Coffee, Colbert, Conecuh, Coosa, Cullman, Dekalb, Escambia, Fayette, Franklin, Geneva, Jackson, Lawrence, Lee, Marion, Mobile, Monroe, Montgomery, Pike, Tuscaloosa, Walker, Winston. *Timme* 7004. Probably in every county.

PELLIACEAE

- Pellia epiphylla* (L.) Lindb. - Calhoun, Cherokee, Coffee, Colbert, Dale, Dekalb, Fayette, Franklin, Jackson, Lauderdale, Lawrence, Lee, Limestone, Marion, Tuscaloosa, Walker, Winston. *Timme & Bowers* 9000. Probably more widespread in the state than indicated here.

METZGERIACEAE

- Metzgeria furcata* (L.) Dum. - Cherokee, Cleburne, Colbert, Conecuh, Cullman, Franklin, Houston, Marion, Pike, Tallapoosa, Walker, Winston. *Timme & Bowers* 10742.
- M. myriopoda* Lindb. - Cherokee, Dale, Geneva, Houston, Pike, Walker. *Timme & Bowers* 10742.
- M. uncigera* Evans - Mobile. (Schuster 1992).

ANEURACEAE

- Aneura pinguis* (L.) Dum. - Colbert, Conecuh, Sumter, Winston. *Nonnenmacher* 91-61. Probably more widespread in the state than indicated from known collections.

Riccardia latifrons Lindb. - Colbert, Dale, Franklin, Lee, Marion, Mobile. *Timme* 8677.

R. multifida (L.) S. Gray - Coffee, Conecuh, Dale, Lawrence, Monroe, Winston. *Timme & Bowers* 9303.

R. palmata (Hedw.) Carruth. - Mobile. (Schuster 1992).

SPHAEROCARPACEAE

Sphaerocarpos texanus Aust. - Baldwin, Lauderdale. *Timme* 6763.

AYTONIACEAE

Asterella tenella (L.) Beauv. - Colbert, Conecuh, Dekalb, Jackson, Lawrence, Lee, Marion, Mobile, Randolph, Tuscaloosa. *Timme* 4286. Probably more widespread in the state than indicated from known collections.

Reboulia hemisphaerica (L.) Raddi - Conecuh, Cullman, Dekalb, Etowah, Franklin Jackson, Lauderdale, Lawrence, Lee, Marion, Mobile, Tuscaloosa, Winston. *Timme* 8887. Probably in every county.

CONOCEPHALACEAE

Conocephalum conicum (L.) Lindb. - Bibb, Coffee, Colbert, Conecuh, Cullman, Dale, Dekalb, Etowah, Jackson, Lauderdale, Lawrence, Marion, Monroe, Tuscaloosa, Winston. *Timme & Bowers* 8891. Probably in every county.

MARCHANTIACEAE

Dumortiera hirsuta (Sw.) Nees - Colbert, Coffee, Conecuh, Cullman, Dale, Jackson, Lauderdale, Lawrence, Lee, Limestone, Marion, Monroe, Winston. *Timme & Bowers* 9110. Probably more widespread in the state than indicated here.

Marchantia papillata subsp. *inflexa* (Nees et Mont) Schust. - Colbert, Coffee, Dale, Dallas, Jackson, Jefferson, Lee, Monroe

M. paleacea Bertol. - Dale, Monroe. *Timme* 6584.

RICCIACEAE

Riccia fluitans L. - Lauderdale, Lee, Mobile. *Timme* 6746a.

R. lamellosa Raddi - Mobile. (in Underwood 1984, no loc.).

R. sorocarpa Bisch. - (in howe 1923, no loc.).

R. huebenerian subsp. *sullivantii* (Aust.) Schust. - Montgomery. *Timme* 9198.

Ricciocarpos natans (L.) Corda. (in Mohr 1901 as *Riccia lutescens* Schw.).

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