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NOTES ON NORTH AMERICAN HEPATICAE. IV

ALEXANDER W. EVANS

With the exception of the new species of Cololejeunea from Florida the Hepaticae discussed in the present paper are all more or less well known. The first species is introduced to call attention to a question of synonymy, the others to record extensions of geographical distribution. It is perhaps worthy of note that twenty-nine species of Lejeuneae, including the two additions mentioned below, are now known from Florida. Since the writer published his synopsis of the Lejeuneae of the United States and Canada,¹ eleven years ago, thirteen species of this group have been added to the flora of the state, and still further additions may reasonably be expected.

I. Riccia arvensis Aust.

The writer recently brought out the fact that Riccia bifurca, as understood by recent European authors, was very closely related to the North American R. arvensis.² It was intimated, indeed, that the two species were probably identical, although no definite conclusion was reached in the absence of living material of R. bifurca for comparison. Such material has since become available. It was collected by W. E. Nicholson near Hasting's, Sussex, England, and sent to Miss Lorenz at Hartford. A portion of this material was kindly forwarded to New Haven and compared with typical specimens of R. arvensis. It proved beyond a doubt that the two species were synonyms. On the basis of this identity the writer again suggests that the species should bear the name R. arvensis Aust., in spite of the fact that R. bifurca Hoffm. was published in 1795 while Austin’s name dates from 1869. The reasons for this suggestion have already been stated at length. They are based upon the following facts: first, that no one knows positively which species or group of species formed the basis for Hoffmann’s description; second, that R. bifurca, as at present understood, dates from 1898, when Heeg definitely restricted the application of the name; third, that, in our ignorance of Hoffmann’s type, there is no convincing evidence that R. bifurca Heeg is identical with, or included under, R. bifurca Hoffm.; and fourth, that Austin’s R. arvensis was clearly described and definitely understood long before the publication of Heeg’s paper. If this suggestion is adopted the name R. bifurca will disappear from the literature as the accepted name of a recognized species.

¹ Mem. Torrey Club 8: 113-183. pl. 16-22. 1902.
² Rhodora 14: 3. 1912.

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Collected in November, 1912, at Highlands, Monmouth County, New Jersey, on the clay bottom of a drained pond, by Miss Haynes, Miss Lorenz, and the writer. Specimens from this locality have recently been distributed by Miss Haynes in her American Hepaticae, No. 116. R. Huebeneriana was first recorded as a North American species by Underwood, in 1894, who cited it from Massachusetts, New Jersey, and Ohio. The next year, however, he made it clear that he understood the species in a somewhat broader sense than is now done, including under it R. Sullivantii (Aust.) Evans as a synonym. Since most if not all of the specimens which he quoted would now be referred to R. Sullivantii, nothing definite is known about the distribution of R. Huebeneriana in North America. The station noted above is therefore worthy of record. The species grows in localities which are favorable for Riccia arvensis and Ricciella Sullivantii. It is characterized by its small size, by its reddish or purplish pigmentation, and by its incomplete rosettes, the thallus forking two or three times with spreading branches. The species is fully described by Müller in Rabenhorst's Kryptogamen-Flora 6: 206. 1907.

3. Riccardia palmata (Hedw.) Carruth. Aneura palmata Dumort. Collected in January, 1913, at Sanford, Florida, on a cypress log in a swamp, by S. Rapp. The earlier writers on North American Hepaticae ascribed a wide distribution to the present species. In 1874, however, Lindberg pointed out the fact that two distinct species were included under Aneura palmata, as ordinarily understood. He reserved the specific name palmata for one of these species and described the other as Aneura latifrons, sp. nov., afterwards changing the name to Riccardia latifrons. To this species he referred the specimens distributed by Sullivant in his Musc. Alleg., No. 279, under the name Aneura palmata. Several years later Underwood stated, or at least implied, that all the North American material of A. palmata really belonged to A. latifrons and that the true A. palmata was not known from this side of the Atlantic. But the next year he listed A. palmata from British Columbia, and since that time an extensive distribution of the species in North America has gradually been re-established. At the present date it is known with more or less certainty from Alaska, British Columbia, Washington, Oregon, and California, and also from Nova Scotia, Ontario, Maine, New Hampshire, Vermont, Connecticut, New York, West Virginia, and Wisconsin. Its detection in Florida indicates of course a

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3 Not. pro F. et Fl. Fenn. 131: 372-376. 1847.
6 Zoe 1: 355. 1891.
marked extension of its known range to the southward. The specimens bear both gemmae and mature capsules and are in unusually good condition. Outside of North America *Riccardia palmata* is widely distributed in Europe and northern Asia.

4. *Cololejeunea setiloba* sp. nov.

Collected at Sanford, Florida, by S. Rapp. The material consists of three specimens, namely: No. 12, on trunk of myrtle near the base, January 28, 1906; No. 27, on trunk of *Ilex glabra*, May 10, 1912; No. 59, May 16, 1912. No. 27 may be designated the type. The specimens are all preserved in the herbarium of the writer at New Haven, Connecticut.

Yellowish or dark green, growing in depressed mats; stems about 0.05 mm. in diameter, appressed to the substratum, at first simple, but afterwards becoming irregularly and often copiously branched, the branches widely spreading, rarely elongated and similar to the stem, usually very short and bearing sexual organs; rhizoids mostly sparingly produced; leaves distantly to subimbricated, the lobe obliquely to widely spreading, plane or slightly convex, ovate from a narrow base, gradually narrowed toward the obtuse or rounded apex, maximum size about 0.4 × 0.3 mm., but often considerably smaller, margin crenulate from projecting cells; lobule in the form of a narrow basal fold with a straight or slightly arched keel, the free margin bearing a single tooth usually consisting of from two to four cells in a row, occasionally two cells wide at the base, hyaline papilla at the tip of the tooth; stylus reduced to a hyaline papilla at the base of the lobule; leaf cells averaging about 15μ along the margin and 18μ in the median and basal portions of the lobe, convex, thin-walled throughout: inflorescence autoicous: ♀ inflorescence sometimes borne on an elongated branch, sometimes on a more or less abbreviated branch, innovating on one side, the innovation usually short and sterile, but sometimes floriferous; bracts obliquely spreading, distinctly complicate but not winged along the keel, the lobe much as in the leaves but usually smaller than the lobes on robust primary shoots, averaging about 0.35 × 0.15 mm., margin crenulate, lobule oblong or obovate, the free portion variable in extent, rounded to subacute, averaging about 0.2 × 0.09 mm.; perianth obovoid, about 0.45 mm. long and 0.35 mm. in diameter, sharply five-keeled to about the middle, the keels roughened from projecting cells, rarely narrowly winged, apex rounded to truncate with a short beak, basal stipe (formed after fertilization) usually short: ♂ inflorescence sometimes terminal on a leading branch, sometimes on a very short branch, the bracts mostly in from one to six pairs, complicate-bilobed with subequal lobes or with the dorsal lobe slightly larger than the ventral, both lobes rounded to subacute at the apex; antheridia mostly in pairs: gemmae without organs of attachment, broadly orbicular, averaging about 0.075 × 0.09 mm., margin crenulate from projecting cells: capsule about 0.15 mm. in diameter; spores greenish, minutely verruculose, about 15μ in short diameter; elaters about 5μ wide. (FIGURES 1-7.)
The present species is the fourth member of the genus *Cololejeunea* (in its restricted sense) to be reported from the United States, the others being *C. Biddiecomiae* (Aust.) Evans, *C. diaphana* Evans, and *C. minutissima* (Smith) Schiffn. A fifth species, *C. Jooriana* (Aust.) Evans, has recently been transferred to the genus *Leptocolea* by the writer and is now known as *L. Jooriana* (Aust.) Evans.

**COLOLEJEUNEA SETILOBA Evans**

Figs. 1 and 2. Robust sterile stems, ventral view, X 45.
Fig. 3. Antheridal spike with two female inflorescences on short branches, ventral view, X 45.
Fig. 4. Tip of a robust female branch with perianth and sporophyte, ventral view, X 45.
Fig. 5. Apex of a robust lobe, X 259.
Fig. 6. Tooth of a lobule, the terminal cell being a hyaline papilla, X 250.
Fig. 7. Gemma, X 250.

The figures were all drawn from the type specimen.

The most remarkable feature of *C. setiloba* is the lobule, which differs considerably in structure from the lobule found in the other species of the genus (Fig. 6). Instead of being large and inflated it is small and plane. Instead of bearing two (or more) marginal teeth it bears a single tooth. This tooth, however, which is homologous with the apical teeth of the other species, is well developed and usually consists of a row of three or four cells, instead of being

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1 See Evans, Bull. Torrey Club 38: 251-286. pl. II, 12. 1911. Reference should be made to this paper in reading the various critical notes under *C. setiloba*. 
composed of only one or two cells. The hyaline papilla, finally, is situated at
the tip of this tooth instead of near the base. Although lobules of the kind
just described seem to be new to the present genus, somewhat similar lobules
are known in certain species of Leptocolea and Lejeunea and represent equally
marked deviations from the type of lobule characteristic of these genera. In
the African Leptocolea cuneifolia (Stéph.) Evans, for example, the apical tooth
consists of a long row of cells tipped with a hyaline papilla, but this tooth is
associated with a lobule which is inflated and otherwise normal in structure.
In Lejeunea pililoba Spruce, of Florida and the West Indies, the lobule agrees
still more closely with that of the new Cololejeunea. It consists of a small basal
fold bearing a very long filiform tooth with a hyaline papilla at its tip. Broader
apical teeth with terminal papillae are known in Leptocolea planifolia Evans, of
Porto Rico, and in its immediate allies, as well as in Lejeunea spiniloba Lindenb.
& Gottsche, of tropical North America, a species to which the writer has recently
called attention.\(^1\) In the species of Leptocolea with these broad apical teeth,
the lobules not only diverge widely from the condition normal to the genus, but
are inconstant in their characters. In describing their peculiarities the sugges-
tion was made that they might simply represent an abnormal development and
that normally developed lobules might conform more closely to the type char-
acteristic of the genus. The study of Cololejeunea setiloba leads to a similar
hypothesis. The lobules present every appearance of being poorly or abnorm-
ally developed, and it is quite possible that the discovery of normally developed
lobules might necessitate a revision of some of the characters assigned to the
species. The great frequency of poorly developed lobules in other members of
the genus, such as C. minutissima and C. myriocarpa (Nees & Mont.) Evans,
lends further support to this idea, and the same thing may be said of the large
and broad lobules found on the perichaetal and perigonal bracts. At the same
time a careful examination of Mr. Rapp's material has failed to demonstrate
any lobules unlike those described.

Leaving the lobules out of consideration C. setiloba shows much in common
with C. minutissima, a widely distributed species in Europe, Bermuda, and the
southern United States. The two species agree in inflorescence, in the structure
of the perianth, and in the thin-walled cells. In C. setiloba, however, the lobes
of the leaves are larger, relatively narrower, and usually more distinctly tapers
ward to the apex. In C. Biddlecomiae, the commonest species in the United
States, the inflated lobules, the papillate lobes and perianths, and the long stylus
afford striking distinctive characters. In C. diaphana, known only from Florida
and Porto Rico, inflated lobules are occasionally produced, but in the absence
of these structures the narrower and more pointed lobes, the more or less elongated
leaf cells, and the solitary antheridia will serve to distinguish the species.

Gemmae are abundantly produced by C. setiloba and show, both in develop-
ment and in structure, the features characteristic of the genus. Unfortunately
they are not always well developed, but a typical gemma is shown in Fig. 7. It

\(^1\) Bryologist 15: 61. 1922.
will be noted that each apical quadrant has cut off three segments and that, by subsequent divisions in these segments and in the basal quadrants, the mature gemma shows eleven cells on each side or twenty-two cells in all. The gemma is crenulate along the margin and lacks organs of attachment. In C. Biddlecomiae and C. minuissima the apical quadrants cut off three and four segments respectively, while in C. diaphana, either three or four segments are cut off. The gemmae in the first two of these species agree with those of C. setiloba in their crenulate margins and lack of organs of attachment; in C. diaphana three such organs are produced, and the margin is denticulate rather than crenulate.


Collected in March, 1913, at Sanford, Florida, on oak, by S. Rapp (No. 63), growing in company with Mastigolejeunea auriculata (Wils. & Hook.) Schiffn.: also in March, 1910, at Siguanea, Trinidad Mountains, Santa Clara, Cuba, on a tree trunk, by E. G. Britton (No. 4933); also, in 1913, at Azua, Santo Domingo, by J. N. Rose. At the time this species was described it was known with certainty from the Bahamas Islands only. Since, however, it is widely distributed and abundant on these islands, its detection in material from Florida and the West Indies is not at all surprising.

Lejeunea serrulata Mont.; Ramon de la Sagra, Hist. phys. pol. y natur. de Cuba 9: 479. pl. 18, f. 3. 1845.

Collected in August, 1905, on a rock in a stream, near Marmelade, Hayti, by G. V. Nash and N. Taylor (No. 1343). Originally collected by Auber in Cuba, no more definite locality being indicated by Montagne. No other stations for the species are known at the present time.


The species was originally described from Cuban specimens collected by C. Wright and distributed in his Hepaticae Cubenses. Many years later the writer discovered it near Cayey, Porto Rico, and published a new description of it with figures. It has been found also in the vicinity of Mayaguez, Porto Rico, first by A. A. Heller, in 1900, and afterwards by E. G. Britton and D. W. Marble, in 1906, (No. 738). Specimens from Heller's collection have been distributed by Miss Haynes in her American Hepaticae (No. 85). During the present year the species has been gathered by Mann at St. Marc, Hayti, and by R. Thaxter at Grand Etang, Grenada, so that it is now known from four of the West Indian Islands. It apparently flourishes at rather low altitudes.


Collected in March, 1909, at Cuna-Cuna Gap, Jamaica, by E. G. Britton (No. 1291); also, in 1913, at Grand Etang, Grenada, by R. Thaxter. Extensions of range. Formerly known from British Guiana (the type locality), Porto Rico, Guadeloupe, Martinique, and St. Vincent.

Collected in April, 1912, at Sanford, Florida, on maple and cypress, by S. Rapp (No. 57). Originally collected by C. Wright, in Cuba, and distributed in his Hepaticae Cubenses. Although no definite locality is mentioned the plant probably came from the vicinity of El Cobre, a town near Santiago, at the eastern end of the island. Until its rediscovery in Florida no other stations for the species had been recorded. In connection with *F. Rappii*, a species likewise from Sanford, Florida, which was proposed as new by the writer in the *Bryologist* for March, 1912, attention was called to *F. cobrensis* and to its close relationship to the new species. Its prompt discovery by Mr. Rapp was very noteworthy. In spite of their close affinities and of the fact that they grow in the same region, the two species seem to retain their distinctive characters.

10. **Anthoceros punctatus** L.

Collected in February, 1902, along Basset Cave Road, Bermuda, by H. Kennedy, and in March, 1902, at Walsingham Caves, Bermuda, by the same collector. New to Bermuda and the second member of the Anthocerotales to be reported from the island, the first being *A. levis* L. In the plants collected in March the spores are fully mature; in those collected in February they are still immature, but sufficiently advanced to show their distinctive features. The specimens were kindly communicated to the writer by Professor W. G. Farlow.

**Yale University.**

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**FIRST SUPPLEMENT—SULLIVANT MOSS SOCIETY**

**EXCHANGE LIST OF HEPATICAE FOUND IN UNITED STATES AND CANADA**

Compiled by Miss Caroline Coventry Haynes from various sources

[Read at S. M. S. Meeting, Brooklyn Botanic Garden, May 24, 1913.]

**ADDITIONAL SPECIES**

**Metzgeriaceae**

*Pallavicinia hibernica* (Hook.) S. F. Gray

**Jungermanniaceae**

*Sphenolobus politus* (Nees) Steph.

*Chiloscyphus rivularis* (Schrad.) Loeske

This is raised from varietal to specific rank.

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