

New mosses of North America. II.

F. RENAULD AND J. CARDOT.¹

(WITH PLATES XII-XIV.)

Microbryum Flærkeanum Sch. var. HENRICI.—Differs from the typical form in the green color of the plant and the excurrent costa, often hyaline at the point.

Kansas: Saline county, on sandy ground (*Joseph Henry*).

Weisia viridula Brid. var. NITIDA.—Characterized by the shorter leaves, and the narrow, subcylindrical capsule, shining as though varnished and distinctly sulcate when dry.

Florida (*Fitzgerald*). Louisiana: Station Slidell, on sandy ground (*A. B. Langlois*).

Dicranum hyperboreum C. Müll. var. PAPILLOSUM.—Differs from the type in its leaves shorter, deeply canaliculate, papillose on the back, and the costa strongly rugose.

Greenland.

DICRANUM SABULETORUM.—In compact green or yellowish tufts. Stems 2-4 cm. long, simple or dichotomous, covered below with ferruginous tomentum. Leaves erecto-patent or subsecund above when moist, flexuous and somewhat crispate when dry, oblong-lanceolate, long narrowed-acuminate, generally somewhat inflexed at margins, subcanaliculate, smooth or papillose at back, serrulate above, 4-6 mm. long, .75-1 mm. broad; costa percurrent or excurrent, generally papillose and denticulate at back above, sometimes nearly smooth. Cells of the areolation short, angular, irregular in the upper part, linear, elongated toward the base, the alar large, lax, quadrate or subhexagonal, orange-brown. External perichætil bracts from a broad base suddenly constricted into a more or less elongated denticulate point, the inner convolute, sheathing, abruptly subulate from the rounded apex. Pedicel yellowish, 20-25 mm. long. Capsule

¹ Provisional diagnoses of most of the following mosses have been issued in *Revue Bryologique*, 1888, no. 5.

pale, cernuous or suberect, oblong or subcylindrical, arcuate, slightly plicate when old, with a small strumose neck. Lid conic, with a long subulate beak. Annulus distinct, teeth purple, cleft to the middle or below into 2-3 quite free or often more or less coherent legs.

D. pallidum BS. *Bryol. Eur.* mem., non C. Müller *Syn.* I, 359, nec plurim. auct. *D. spurium* var. *condensatum* Lesq. et James, *Manual* 76, non *D. condensatum* Hedw. *D. arenarium* Ren. et Card. mss. in litt. et sched.

"In arenosis siccis meridionalibus." (Sull. and Lesq. *Musci bor. Amer. exsicc.*) "In dry sandy places on hills, especially in southern districts." (Lesq. and James, *Manual*, 76.) We have this plant from Florida (*Fitzgerald, Sawyer*), Louisiana (*Langlois*) and Carolina (*H. A. Green*). Probably in all the southern states.

Since the establishment of our species in the *Revue Bryologique*, we ascertained from the examination of two authentic specimens of *D. pallidum* BS., in the herbarium of the Botanical Garden of Brussels, that this plant, only mentioned by the authors of the *Bryologia Europæa* as a species closely resembling in habit the *D. Muhlenbeckii* BS., is identical with the *D. spurium* var. *condensatum* of the American bryologists, from which we have made our *D. sabuletorum*. Therefore, the name of *D. pallidum* BS. should be retained by right of priority. But, as Müller, in his *Synopsis*, described erroneously under the name of *D. pallidum* BS. a form of *D. scoparium*, and as it is generally this form which is known in the current literature as *D. pallidum*, it seems to us to be most convenient to adopt a name about which there can be no mistake, and therefore we retain our name of *D. sabuletorum*.

This species is intermediate between the *D. spurium* Hedw. and the *D. Muhlenbeckii* BS. and *D. brevifolium* Lindb., differing from the first in its much narrower and not undulate leaves, and from the last two species in the form of its perichæatial bracts, and the thinner walls of the cells of its leaves.

Dicranum scoparium Hedw. var. *SULCATUM*. (Florule de l'île Miquelon, 44.)—Differs from the typical form in the following characters: tufts yellowish; stems more slender; leaves often flexuous, erecto-patent or subsecund, narrower and more narrowly subulate, more sharply serrate above; cells of the areolation habitually destitute of chlorophyll, less

porose, rather thin-walled; pedicel pale yellow, more slender, sharply twisted; capsule pale, tawny, deeply sulcate when old, and provided with more distinct longitudinal bands of orange-colored, elongated, sinuous and thick-walled cells.

Miquelon Island (*Dr. Delamare*).

By the pale tint of the tufts, pedicels and capsules, this remarkable variety, with rather the appearance of *D. longifolium*, belongs to the group of forms generally designated as *D. pallidum* C. Müll., or *D. scoparium* var. *pallidum*, but it is distinct by its narrower leaves, with a longer and more sharply serrate subula and its deeply sulcate capsule.

DICRANUM HOWELLII.—In soft, rather silky, yellowish green tufts. Stems slender, erect, simple or dichotomous, tomentose below, 4–12 cm. long. Leaves not crowded, secund or erecto-patent, narrowly lanceolate, long subulate, nearly setaceous, serrate in the upper half, often slightly undulate when dry, 6–10 mm. long, .75–1 mm. broad at base; costa more or less serrate at back toward apex; cell-walls porose, but scarcely thickened. Inner perichæatial bracts sheathing, rather suddenly narrowed into a long flexuous point, entire or coarsely sinuate at base of the subula. Pedicel pale, at last sharply twisted to the left, 25–35 mm. long; capsule rufescent, cylindraceous, arcuate, slightly plicate when old; lid with a long curved beak. Inflorescence monœcious or pseudo-monœcious; male flowers sessile, axillary, or set upon small, slender flexuous branchlets.

Oregon (*Th. Howell, L. F. Henderson*).

This plant is a remarkable form, belonging to the group of *D. scoparium*, of which it may be only a sub-species, but well characterized by the form of its perichæatial bracts, narrowed at apex, and not abruptly subulate from the rounded apex, as is the case in *D. scoparium*. In habit and shape of the leaves it specially resembles the last variety.

DICRANUM MIQUELONENSE. (Florule de l'île Miquelon, 42.)—In small, compact, yellowish green tufts. Stems dichotomous, radiculose below, 1–3 cm. long. Leaves small, short, erect-imbricate or slightly incurved, oblong-lanceolate, acute or obtuse, concave, entire or minutely sinuate-denticulate at apex, 2–3 mm. long, .50–.75 mm. broad; costa vanishing near the apex, smooth or scarcely rugose at back. Cells of the areolation smooth, small, short, quadrate or irregularly angular in the upper half, rectangular, 1–3 times longer than

broad, thin-walled toward the base, the alar lax, large, quadrate or subhexagonal, brown or yellowish. Fruit unknown.

Miquelon island, on ground and rocks (*Dr. Delamare*).

Rather resembling in habit the stunted forms of *D. elongatum* Schw. and *D. tenuinerve* Zett., but quite distinct by the form and areolation of the leaves. It has also some affinities with *D. flagellare* Hedw.

Fissidens incurvus Schw. var. *BREVIFOLIUS*.—Leaves broader and shorter; border of the vaginant lamina widening less at base.

Louisiana: on ground in woods near Baton Rouge (*Langlois*.)

TRICHODON FLEXIFOLIUS.—Loosely cespitose, green. Stems erect, simple, short, 2–5 mm. long. Lower leaves small, lanceolate-subulate, the upper larger, patulous, very flexuous, 3–4 mm. long, .35–.50 mm. broad, from an oblong base gradually narrowed into a long linear-subulate, canaliculate, subtubulose point, sinuate at the margins, toothed at apex, and with a broad costa, obscurely excurrent. Cells of the base rectangular, elongated, 2–4 times longer than broad, the others small, quadrate, very chlorophyllose, with transverse walls slightly prominent. Perichæatial bracts similar to the leaves, but dilated and subsheathing at base; archegonia 2–4. Male flowers on the same plant below the female, small, gemmiform; perigonial bracts 4–5, the external broadly ovate, suddenly narrowed, cuspidate, the inner broadly and obtusely acuminate, obsoletely costate; antheridia 3–5, sessile, elongated, with some paraphyses. Fruit unknown.

Florida: on sandy ground, near Beauclerc (*F. C. Sawyer*, 1887).

It is only by the examination of the fruit that we can be certain about the generic position of this species; however, by its vegetative system, it seems closely allied to *T. cylindricus* Sch., from which it differs in the monœcious inflorescence, the gradually narrowed leaves, and the shorter cells of the areolation.

Physcomitrium pyriforme Brid. var. *LANGLOISII*.—Characterized by the longer-acuminate leaves, the generally longer pedicel (15–20 mm.) and the asymmetrical calyptra, 2–5 lobate at base, but entirely cleft on one side.

Louisiana: Pointe-à-la-Hache, on ground in half-shaded places, growing with the typical form (*A. B. Langlois*). New Jersey: Atco (*H. A. Green*).

WEBERA CARDOTI Ren.—Loosely cespitose, pale green or yellowish. Stems simple, erect, slender, rigid and brittle. Leaves small, erect, imbricate, oblong-lanceolate, decurrent, strongly revolute on the borders, obtuse or subobtusate, rarely subacute, generally sinuate-denticulate at apex, 1–1.5 mm. long, .35–.50 mm. broad; costa very broad, green, percurrent or vanishing very near the apex, widening below and occupying one-third of leaf base. Areolation loose, cells truncate or subattenuate, 2–3 times longer than broad. Pedicel reddish, flexuous, often geniculate at base, 10–15 mm. long. Capsule oblong-subpyriform, symmetric, erect, yellowish or brownish, tapering to an attenuate neck, 2–2.5 mm. long, .35–.75 mm. broad; lid conic. Peristome small, pale yellow, pellucid, very minutely papillose; teeth triangular-lanceolate, long acuminate, provided with 15–25 lamellæ; inner peristome more or less perfect, with split segments and cilia, or reduced to a variously raised and lacerate membrane. Annulus of 2–3 rows of cells. Male plant distinct, smaller; flowers gemmiform, terminal.

Oregon: Mt. Hood, wet sandy rill-banks, growing with *Polytrichum sexangulare* Fl. (*L. F. Henderson*). Already kindly communicated in 1882 by Mr. L. Lesquereux, but likely from the same collector, who sent to us recently a large and very interesting collection of Pacific coast mosses, including several new species, which we are now describing and drawing for the BOTANICAL GAZETTE.

The *W. Cardoti* is allied to *Pohlia erecta* Lindb., from Norway, but this has the leaves plane on the borders, the costa less broad, vanishing far below the apex, the peristome reddish, etc. *W. commutata* Sch. is also somewhat related to our species, but is at first sight distinguishable from it by its drooping and broader capsule, the convex apiculate lid and the larger peristome.

BRYUM SAWYERI.—Loosely or densely cespitose, green or brownish. Stems short, 10–15 mm. long, radiculose below, branching by several innovations and more or less copiously provided in the upper part with brown, thick, simple, articulate and very caducous filaments, arising from the axils of the leaves. Leaves regularly distant or the upper tufted,

open when moist, erect-imbricate and often slightly twisted when dry, rather concave, oblong-subspatulate, narrowed at base, shortly acuminate, plane on the borders, obsoletely denticulate in the upper part, 2-2.5 mm. long, .5-1 mm. broad; costa percurrent or shortly excurrent. Areolation large, hexagonal, cells 2-4 times longer than broad, thin-walled; at the margins, 1 or 2 rows of narrow, elongated cells, but not forming a distinct border. External perichæ-tial bracts longer, more distinctly bordered, the 2 or 3 inner smaller. Pedicel reddish, 25-45 mm. long. Capsule brown or rufescent, pendent, finally oblique or subhorizontal, defluent into a long attenuate neck, constricted below the mouth after the fall of the convex-apiculate lid. Teeth of the peristome densely trabeculate; segments split; cilia long and appendiculate. The inflorescence seems to be dioecious, the male flowers being unknown.

Florida: Enterprise, on sandy ground and at base of trees (*Fitzgerald*), Beauclerc, on decayed logs (*F. C. Sawyer*). Louisiana: Pointe-à-la-Hache, on wall (*A. B. Langlois*).

This species is readily distinguished from *B. capillare*, to which it is nearly allied, by its leaves plane on the margins and without distinct border. The brown articulate filaments, which arise from the axils of the leaves and perhaps help the propagation of this moss, are generally very copious on sterile specimens, while they are rare or even wanting on the fertile plant.

Fontinalis antipyretica L. var. OREGANENSIS.—A remarkable form, with very slender, soft, pinnate stems, yellowish and shining above, not naked below. Stem-leaves distant, open, lanceolate. Branches cuspidate. Branch-leaves erect, imbricate at the top of the branches. Cells of the areolation very long and narrow.

Oregon: top of Coast mountains, in swamps, on the roots of trees. (*Th. Howell*).

FONTINALIS DELAMAREI.—Dull green, stems 15-30 cm. long, naked below, much divided; branches irregularly pinnate, branches erecto-patent, attenuate. Leaves crowded, erect, loosely imbricate, oblong-lanceolate, obtusely acuminate, concave, not keeled, slightly incurved on the borders, 3-4 mm. long, .75-1.25 mm. broad. Cells of the areolation linear-elongated, sometimes rather flexuose, the alar few,

small, subhexagonal. Perichæatial bracts often lacerate at the rounded apex. Capsule immersed, oblong-subcylindrical, 2 mm. long, .75 mm. broad; lid conic-acuminate. Teeth of the peristome about .50 mm. long, narrowly linear-acuminate, with 14–20 lamellæ; divisural line distinct at the base only and not perforated. Cilia of the inner peristome united at apex only, the lower transverse bars imperfect, papillose, not appendiculate. Diameter of the spores .025–.028 mm.

On stones in the rivulets of Miquelon island, copiously fruiting (*Dr. Delamare*).—In our work on the flora of the Miquelon island,² we indicated this moss as *F. squamosa* L. At that time we knew the plant only from sterile specimens, and in this state it is almost impossible to distinguish it from *F. squamosa*.

The *F. Delamarei* is perhaps a sub-species of *F. squamosa*; it is intermediate between this species and *F. Nova-Angliæ* Sull., resembling the first by the characters of the vegetative system, and related to the second by the organs of fructification, as far as we can judge from the tab. 65 of the Sullivant's Icones. The original, but sterile specimen of this last species, for which we are indebted to the kindness of our venerable friend, Mr. Lesquereux, differs from our plant in the more slender stems, pinnately branched at right-angles, and in the leaves more distant, not imbricate, characters which give to the plant quite a different facies.

The true *F. squamosa* L., not yet recorded from America, differs from *F. Delamarei* in the following characters: capsule twice as large, ovoid or ovate-oblong, rounded at base; teeth of the peristome twice as long (about 1 mm.), more strongly papillose, more densely trabeculate (26–32 lamellæ); divisural line more distinct and often perforated toward the base; inner peristome perfectly latticed; spores generally a little larger (.028–.031 mm.).

Alsia Californica Sull. var. FLAGELLIFERA.—More slender than the type, with numerous filiform, flagellate branchlets, covered with very small lanceolate leaves.

California: Monterey, on trees (*Misi Martha R. Mann*).

Eurhynchium strigosum BS. var. BARNESI.—Differs from the European type in the stems rather more robust, the stem-leaves larger, longer acuminate, the branch-leaves more

² Florule de l'île Miquelon, Lyon, 1888.

elongated, obtuse or subacute, and the capsule shorter, broadly ovate.

Idaho: Lake Pend d'Oreille, on logs (*Leiberg*, communicated by Mr. Ch. R. Barnes).

Eurhynchium strigosum BS. var. FALLAX.—Form robust, resembling in habit *E. myosuroides*. Stem-leaves very large, triangular-lanceolate, obtuse; branch-leaves rounded at apex. Capsule like that of the typical form.

Idaho, with the preceding.

The type from Europe has the stem-leaves ovate-triangular, suddenly narrowed-acuminate, the branch-leaves lanceolate, acute or subobtuse and the capsule oblong. It rather resembles in habit *E. praelongum* or *E. Stokesii*. This typical form, like the two vars. *Barnesi* and *fallax*, has the leaves distant, open or erecto-patent. The forms belonging to the var. *præcox* Wahl. and *diversifolium* Lindb. (*E. diversifolium* BS.), and which are, at least in Europe, the most widely distributed, have quite a distinct facies, by their concave and closely imbricate leaves and their cylindrical julaceous branches. These forms, which in Europe occur only in alpine and subalpine districts, are met with in low countries of the United States, as the *E. diversifolium* issued in the *Musci bor. Amer. exsicc.* no. 432 was collected, according to the label, in the hills of Ohio. We have it also from Montana, near Helena (*F. W. Anderson*, communicated by Mr. Ch. R. Barnes).

Plagiothecium denticulatum BS. var. MICROCARPUM.—Differs from the type in its very short and turgid capsule, scarcely 1.5 mm. long, and the thick, flexuous pedicel, often geniculate at base.

Idaho: Kootenai county (*Leiberg*; kindly communicated by Mr. Ch. R. Barnes).

Amblystegium riparium BS. var. SERRATUM.—Plant slender, creeping. Leaves narrow, serrulate at apex.

Kansas: Saline county, roots of trees (*Joseph Henry*).

Amblystegium riparium BS. var. FLORIDANUM.—Very small, appressed. Leaves small, narrowly lanceolate, long acuminate, entire. Capsules short, scarcely 1-1.5 mm. long, arcuate.

On logs, rotten wood, roots and base of trees. Florida (*Garber*). Louisiana, Lafayette's woods (*Langlois*).

HYPNUM SYMMETRICUM.—This plant is a subspecies of *H. uncinatum* Hedw., from which it differs in the less strongly and less regularly plicate leaves, entire or very slightly denticulate, and chiefly in the narrower, erect and quite symmetric capsules, sometimes clustered by two in the same perichætium.

Oregon: On ground, in damp woods (*Th. Howell*).
Idaho: Lake Pend d' Oreille, on logs (*Leiberg*; kindly communicated by Mr. Ch. R. Barnes).

Hypnum arcuatum Lindb. var. **AMERICANUM** (Florule de l'île Miquelon, 56).—Differs from the typical form in the stems, slender, prostrate, more or less distinctly pinnate and the leaves smaller, with the acumen shorter and broader, blunt and usually denticulate at apex.

Decayed wood and sandy ground. Louisiana; Baton-Rouge, Pointe-à-la-Hache, Riviere-aux-Cannes (*Langlois*).

The type has been collected at Bethlehem, Pa., by E. A. Rau, and the var. *demissum* Sch. near Baltimore by Fitzgerald. This species has been confounded with *H. curvifolium* Hedw., from which it is easily distinguished by the alar leaf-cells, lax, inflated, hyaline and forming distinct auricles.

We will indicate here several species not previously recorded from North America:

Eucladium verticillatum BS.—California: Santa Ana Cañon (*Sam. B. Parish*, kindly communicated by Miss Clara E. Cummings).

Dicranum tenuinerve Zett.—Miquelon island (*Dr. Delamare*).

Fissidens Bambergeri Sch.—Kansas: Saline county (*Joseph Henry*). Louisiana: Point-à-la-Hache (*Langlois*).

Fissidens viridulus Wahl.—Louisiana: St. Martinsville (*Langlois*). Probably confounded with *F. incurvus* Schw.

Trichostomum nitidum Sch.—United States, without locality, collected by *James*, communicated by Mr. Bescherele.

Bryum microstegium Sch.—Labrador (*Freeman*).

Polytrichum sexangulare Fl.—Oregon: Mt. Hood, sterile (*Henderson*).

Amblystegium porphyrrhizum Lindl.—Miquelon island (*Dr. Delamare*). Kansas: Saline county (*Joseph Henry*).

Amblystegium Kochii BS.—Kansas: Saline county (*Joseph Henry*).

Hypnum Vaucheri Lesq.—Montana: near Helena (*Anderson*, communicated by Mr. Ch. R. Barnes). This species is allied to *H. cupressiforme* L., is quite distinct from the *H. Vaucheri* of the Manual, p. 414, which is an *Eurhynchium* (*E. Vaucheri* BS., *Hypnum Tommasinii* Sendtn.).

In Kindberg's *Enumeratio muscorum qui in Groenlandia, Islandia et Færoer occurrunt* (1888), are indicated many species which are not described in the Manual of Lesquereux and James.

Monaco, and Stenay, France.

EXPLANATION OF PLATES XII-XIV.—All figures enlarged more than 15 diameters are copied by means of Nachet's camera lucida.

Plate XII. A. *Dicranum sabuletorum*. *a a*, entire plant; *b b*, leaves; *c c c*, point of same; *d*, basal areolation; *e*, areolation of the upper part; *f*, external perichætil bract; *g*, inner perichætil bract; *h*, point of same; *i*, capsule and lid.—B. *Dicranum Howellii*. *a a*, entire plant; *b*, leaves; *c*, perichætil bract; *d*, ditto of *D. scoparium*.—C. *Dicranum scoparium* var. *sulcatum*. *a*, point of a leaf; *b*, capsule; *c*, portion of the capsular membrane, showing the areolation of a longitudinal band.—D. *Dicranum Miquelonense*. *a*, entire plant; *b b b*, leaves; *c*, point of same; *d*, areolation of the base; *e*, areolation of the upper part.

Plate XIII. A. *Trichodon flexifolius*. *a*, entire plant; *b*, lower leaf; *c*, upper leaves; *d*, areolation of the base of same; *e*, areolation of the upper part of same; *f*, transverse section of same; *g*, point of same; *h*, perichætil bract; *i*, external perigonal bract; *j*, inner perigonal bracts, showing the antheridia by transparency.—B. *Webera Cardoti*. *a*, entire female plant; *b*, male plant; *c*, leaves; *d*, areolation of the middle; *e*, areolation on the borders; *f*, capsule; *g*, the same, deoperculate; *h*, portion of the peristome.—C. *Bryum Sawyeri*. *a*, entire plant; *b b*, leaves; *c*, point of same; *d*, areolation of same; *e*, axillary filaments; *f*, capsule.

Plate XIV. A. *Fontinalis Delamarei* and *F. squamosa*. *a*, leaf of *F. Delamarei*; *b*, capsules of the same; *b^x*, capsule of *F. squamosa*; *c*, teeth of the peristome of *F. Delamarei*; *c^x*, ditto of *F. squamosa*; *d*, portion of a tooth toward the base, *F. Delamarei*; *d^x*, ditto *F. squamosa*; *e*, portion of the inner peristome of *F. Delamarei*; *e^x*, ditto of *F. squamosa*; *f*, calyptra of *F. Delamarei*.—B. *Eurhynchium strigosum*. *a*, stem-leaf of the European type; *b b*, branch-leaves of the same; *c*, capsule of the same; *a^x*, stem-leaf of var. *Barnesi*; *b^x b^x*, branch-leaves of the same; *c^x*, capsule of the same; *a^{x x}*, stem-leaf of var. *fallax*; *b^{x x} b^{x x}*, branch leaves of the same. C. *Hypnum symmetricum*. *a*, entire plant; *b b*, leaves; *c*, capsules.



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