76. **C. aquatilis** Wahl.

Swamps and edges of bogs; on the plateau of northern C.B.; grading into the following variety. Arctic America south to Nfld. C.B., Gaspe, and in the mts. to N.M. & Calif.

Var. **altior** (Rydb.) Fern., Rhodora **44**: 295-298. 1942, is found in ditches, flood-plains, around lakes and ponds; rather common, especially in the northern counties. (*C. substricta* (Kukenth) Mack. *C. aquatilis* var. *substricta. C. aquatilis* var. *elatior* Bab.).

Nfld. to B.C. south to N.J., Ind., Neb. & Ore.

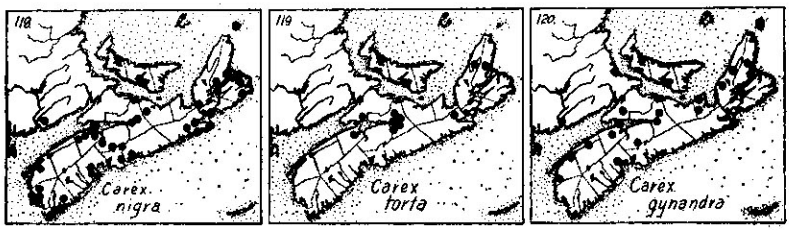
77. **C. stricta** Lam. Fig. 27.

The status of this species and its variety is rather obscure for the province. Mackenzie does not admit *C. stricta* to the flora of N.S., although collections in herbaria are often named this. Like the complex of *Scirpus acuta* and *S validus*, I believe that it should be further studied in the field before a satisfactory disposition can be made. At any rate one or both are common, particularly in the north-central counties, being often the dominant vegetation over large areas of poorly-drained depressions, in bogs or swales. The key from the N.A. Flora is given for further study.

a. Plants forming beds, with long horizontal stolons numerous; leaf-blades glaucous-green, light-green, or blue-green, flat or nearly so to base; leaf-sheaths markedly hispidulous ventrally and with a narrow hyaline jagged margin at mouth. Var. *strictior* (Dewey) Carey

a. Plants very densely cespitose, forming dense tussocks, long horizontal stolons usually not conspicuous; leaf-blades deep-green, channeled and keeled towards the base; leaf-sheaths smooth ventrally and without a narrow hyaline jagged-ciliate margin at mouth. *C. stricta*

N.S. to Minn. south to N.C. & Tex.



78. **C. torta** Boott Map 119. Fig. 27.

Common from Annapolis Co. to C.B.; characteristic of brooksides, margins of rivers, on boulder plains, occasionally

beside lakes. The habitat is widely different from that of most other members of this section.

Rocky stream beds; N.S. to Minn. south to N.C. & Ark.

SECT. 30. **CRYPTOCARPAE**

a. Long horizontal stolons or rootstocks absent; plants of non-brackish habitats only; spikes long and usually drooping (Fig. 28, a).
b. Sheaths rough-hispidulous on the ventral side; lower pistillate scales tapering into the awn.
c. Culms tall with leaves 4-12 mm wide; pistillate spikes 2.5-10 cm long, drooping; perigynia to 3.5 mm long. 79. *C. gynandr*
c. Culms shorter, with leaves 4-6 mm wide; pistillate spikes 1-3.5 cm*a* long, sub-erect; perigynia 2.5-3 mm long. *C. gynandra* var. *simulans*
b. Sheaths smooth on the ventral side; lower pistillate scales mostly abruptly contracted into the awn.
d. Spikes moderately separated, spreading to drooping, 3-10 cm long; pistillate scales all exceeding the perigynia. 80. *C. crintia*
d. Spikes aggregated towards the top of the culm, ascending to spreading, not over 3.5 cm long; pistillate scales not exceeding the upper perigynia and commonly less than twice as long as the lower. *C. crinita* var. *minor*
a. Long horizontal stolons or creeping rootstocks present; plants of tidal flats or saline marshes.
e. Spikes rarely erect, stout and elliptical, long-stalked; scales very long-awned (Fig. 28, c). 81. *C. paleacea*
e. Spikes erect, sessile or nearly so, long and slender; pistillate scales acute, cuspidate or short-awned, much longer than the perigynia. 82. *C. recta*

79. **C. gynandra** Schwein. Map 120.

General throughout; ditches, moist places, in clumps along roadsides, by streams and in swampy woodlands. (*C. crinita* var. *gynandra* (Schwein.) Schwein. & Torr.) Swampy wood-lands Nfld. to Wisc. south to Fla. & La.

Var. **simulans** (Fern.) n. comb. was collected in a woodland on St. Paul Island (Perry, 1931). It is a northern var. ranging from Nfld. south to Vt. & Mass. (*C. crinita* var. *simulans* Fern.).

80. **C. crinita** Lam. Map. 121. Fig. 28.

Scattered from Kings and Cumberland Co. to northern C.B.; wet meadows, flood plains, along brooks and streams, and in ditches. N.S. to Minn. south to N.C. & Tex.

Var. **minor** Boott, see Weatherby, Rhodora **44**: 232. 1942. This smaller extreme is found in the south-

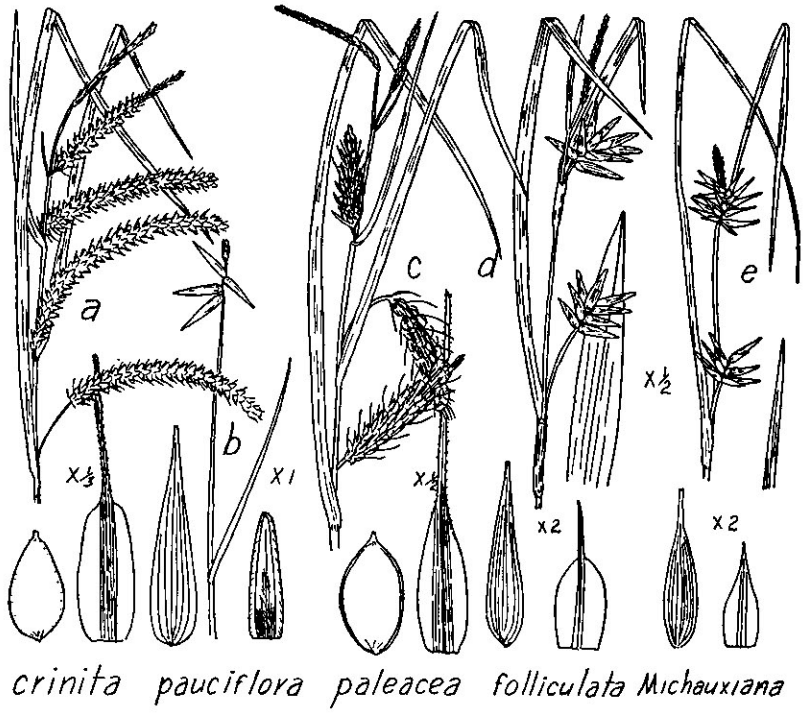


Fig. 28.—**Carex:** inflorescences; perigynia and scales, x 5 and x 2.

western counties and extends east at least to the middle of the province. Most of the specimens northward, however, are luxuriant and very long-spiked. N.S. to N.Y.

81. **C. paleacea** Wahl. Map 122. Fig. 28.

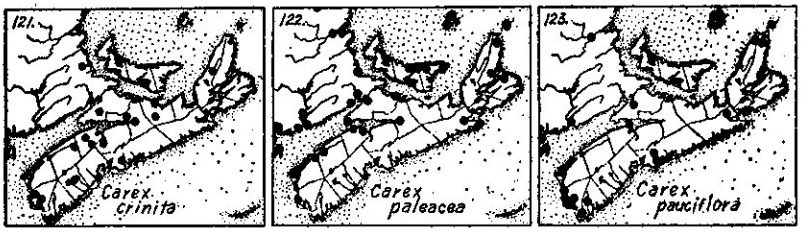
Common around the coast; growing in large pure areas around the heads of the salt marshes, or scattered with other salt marsh plants where the soil is more brackish; occasionally growing in swales or in pockets of the cliffs near the salt water. (*C. paleacea* var. *transatlantica* Fern. *C. maritima* of Gray's Man.).

An extreme form with very short, and short-stalked, pistillate spikes which are erect instead of drooping, has been named forma **erectiuscula** Fern., Rhodora **44**: 293. 1942.

Salt meadows; Greenland & Nfld. south to Mass.; Eu.

82. **C. recta** Boott.

Common in parts of the province and possibly around the whole coast; brackish meadows, heads of the salt marshes and coastal swales. It much resembles *C. strictior* and may



occasionally hybridize with it. (*C. salina* vars. *cuspidata* Wahl. & *kattegatensis* (Fries) Almq.).

Lab. to Mass. and west to Alaska; Eu.

SECT. 31. **ORTHOCERATES**

83. **C. pauciflora** Lightf. Map 123. Fig. 28.

Common throughout, characteristic of sphagnum bogs, especially near the coast; common in northern C.B. in bogs, along flood-plains or even out on dryish heaths and barrens.

Nfld. to Alaska south to Conn., Minn. & Wash.; Eurasia.

SECT. 32. **FOLLICULATAE**

a. Leaves 2-4 mm wide; bract-sheaths concave at the mouth; staminate spikes 5-15 mm long, sessile or very short-stalked.
84. *C. Michauxiana*

a. Leaves 3.5-16 mm wide; upper or all bract-sheaths prolonged at the mouth; staminate spikes 12-30 mm long, long-stalked.
85. *C. folliculata*

84. **C. Michauxiana** Boeckl. Map 124. Fig. 28.

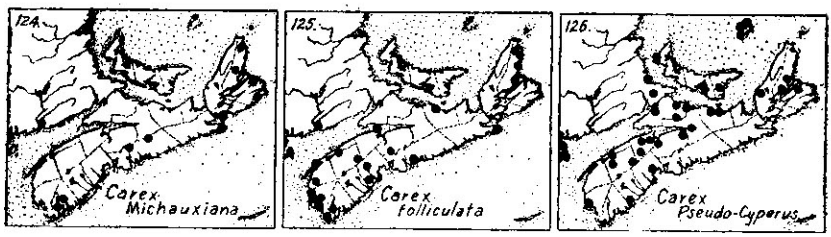
Rare in the southwestern counties, becoming commoner east to C.B.; boggy savannah, Sable R., Shelburne Co. & swale bordering Grand L., Halifax Co. (Fernald, 1921); characteristic of mountain swamps, sandy or rocky beaches and in poorly-drained swamps in C.B. (*C. abacta* Bailey).

Nfld. to Ont. south to Penn.; Asia.

85. **C. folliculata** L. Map 125. Fig. 28.

Throughout; wet woods, swales and thickets; scattered in Kings Co.; common on the quartsite or granitic areas; characteristic of wooded swamps in C.B.

Nfld. to Wisc south to N.C.



SECT. 33. **PSEUDO-CYPEREAE**

86. **C. Pseudo-Cyperus** L. Map 126. Fig. 29.

Rare in the southwestern counties (Fernald, 1921); scattered from Annapolis and Queens Cos. to C.B., never abundant; wet meadows, undrained ponds, swampy thickets and grassy swales.

Nfld. to Sask. south to Penn. & Minn.

86a. **C. comosa** Boott.

An examination of some specimens of *C. Pseudo-Cyperus* collected in swales east of Aylesford near the Caribou Bog showed one plant of the closely allied *C. comosa*. This plant has also been recently collected in other parts of the Valley by Mr. David Erskine. It is distinguished from *C. Pseudo-Cyperus* by the fact that the teeth of the perigynia are up to 2 mm or more long and strongly spreading, instead of being short and erect.

N.S. to Wash. south to Fla. and Calif.

SECT. 34. **PALUDOSAE**

87. **C. lacustris** Willd. Fig. 29.

Local, growing between brackish marshes and the *Typha latifolia* zone bordering the upland; border of brackish marsh near Yarmouth; often growing in large pure colonies around the estuaries at the head of the Bay of Fundy. (*C. riparia* Curtis. *C. riparia* var. *lacustris* (Willd.)Kuk.).

N.S. & Que. to Man. south to D.C. & Iowa.

SECT. 35. **VESICARIAE**

a. Pistillate scales, except rarely the lowest, without long rough awns.
  b. Pistillate spikes oblong to cylindrical; leaves flat, over 3 mm wide.
    c. Bracts usually not much longer than the inflorescence; perigynia very rarely reflexed; plants with creeping rootstocks.

d. Perigynia with smooth beaks; spikes cylindrical with 30-150 perigynia.

e. Perigynia sub-globose, loosely ascending; spikes 4-8 mm wide; basal sheaths rather fibrillose and without blades; culms sharply triangular above; plants with short rootstocks (Fig. 29, c).
88. *C. vesicaria*

e. Perigynia narrower, often spreading; spikes various; basal sheaths not fibrillose, with leaf-blades; culms rather obtusely-triangular above; long slender rootstocks present (Fig. 29,d).

f. Plant 3-6 dm high; leaves canaliculate, 3-4 mm wide; pistillate spikes 6-8 mm thick; scales short, blunt to acute; perigynia 3-5 mm long. 89. *C. rostrata*

f. Plant 4-12 dm high; leaves flat, 4-12 mm wide; pistillate spikes denser, 10-20 mm thick, the scales acuminate to aristate; perigynia 4-10 mm long. *C. rostrata* var. *utriculata*

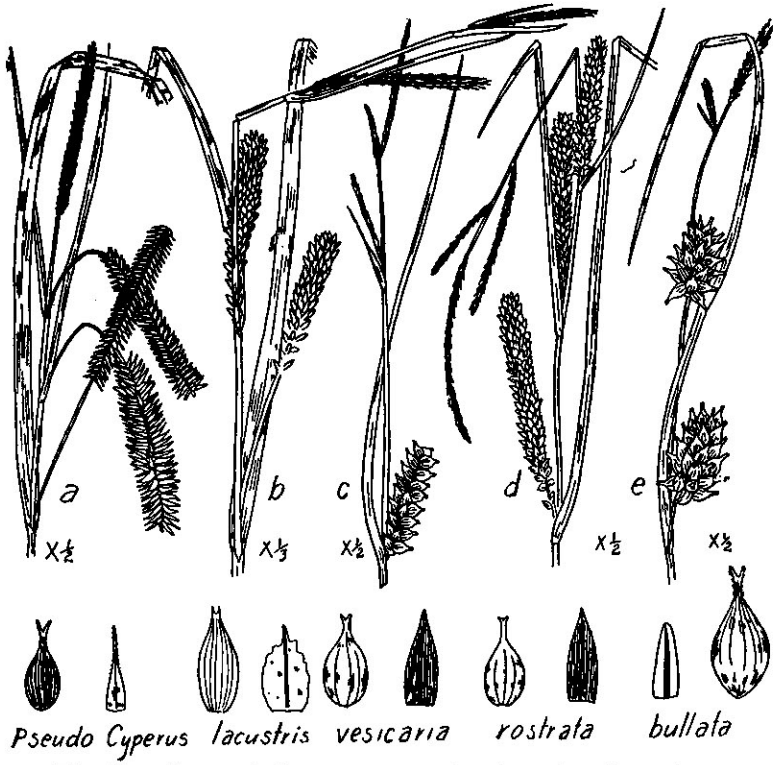


Fig. 29.—**Carex:** inflorescences; perigynia and scales, x 2.

d. Perigynia with rough beaks; pistillate spikes short, with 20-40 perigynia; culms slender, sharply triangular (Fig. 29, e).
90. *C. bullata*

c. Bracts several times the length of the inflorescence; perigynia reflexed to widely spreading; culms cespitose, without long horizontal stolons. 91. *C. retrorsa*

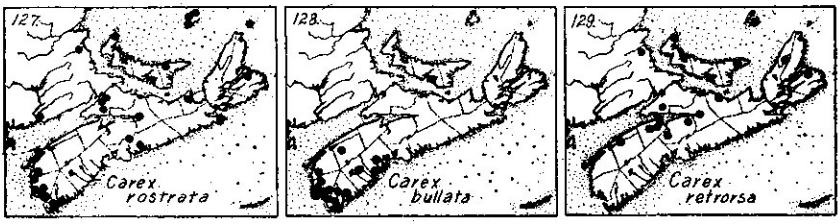
b. Pistillate spikes small, globose, 3-15-flowered; leaves 1-3 mm wide, strongly involute (Fig. 30, a). 92. *C. oligosperma*

a. Pistillate scales with long, rough awns (Fig. 30, b). 93. *C. lurida*

88. **C. vesicaria** L. Fig. 29.

Scattered throughout, very variable; meadows, intervales and along streams. The commoner varieties are: var. **jejuna** Fern. with pistillate spikes 5-8 mm thick; var. **distensa** Fries, with these spikes 10-15 mm thick, collected at Gavelton, Yarmouth Co.; and var. *laurentiana* Fern., Rhodora **35**: 232. 19-33, which ranges from Nfld. to Grand Manan should be found in the northern parts of the province. It has the spikes 7-12 mm. thick with very long and broad, usually dark-purple scales. A report of *C. Grahami* from Ingonish, Rhodora **3**: 49. 1901, probably belongs here; and also Macoun's records of *C. monile* Tuckerm.

Nfld. to B.C. south to Dela. & Calif.; Africa; Eurasia.



89. **C. rostrata** Stokes. See Fernald, Rhodora **44**: 324-331. 1942, and Nelmes, Jour. Bot. **80**: 109-112. 1942. Map 127. Fig. 29.

Rare; swamp on St. Paul Is., northern C.B.) Perry, 1931). This is the northern plant which barely reaches south to N.S.

Var. **utriculata** (Boott) Bailey is scattered throughout; wet meadows, open wet pastures and in ditches and swales.

Lab. to B.C. south to N.S., N. Eng., Minn. & Calif.; Eurasia.

90. **C. bullata** Schkuhr, var. **Greenei** (Boeckl.)Fern. Map 128. Fig. 29.

Abundant in the southwestern counties, and scattered

east to Annapolis and Lunenburg; swales, boggy meadows, wet woods and edges of streams and lake shores.

Ga. north to Me.; N.S.

91. **C. retrorsa** Schwein. Map 129.

Annapolis Co. to C.B.; apparently rather rare; alluvial woods and swales.

N.S. to B.C. south to N.J., Ohio, & Ore.

92. **C. oligosperma** Michx. Map 130. Fig. 30.

Common near the coast from Yarmouth to C.B.; scattered inland, and abundant in C.B.; boggy swales, barrens, swamps and occasionally peat bogs.

Nfld. to the Mackenzie, south to Mass., Penn. & Ind.

93. **C. lurida** Wahl. Map 131. Fig. 30.

Common throughout, especially so from Annapolis east; swamps, wet meadows, ditches, and thickets. Besides the common form there occurs in the center of the province a small plant with short erect spikes and whitish inflated perigynia, var. **gracilis** (Boott) Bailey. (*C. tentaculata* Muhl.).

N.S. to Minn. south to Fla. & Tex.

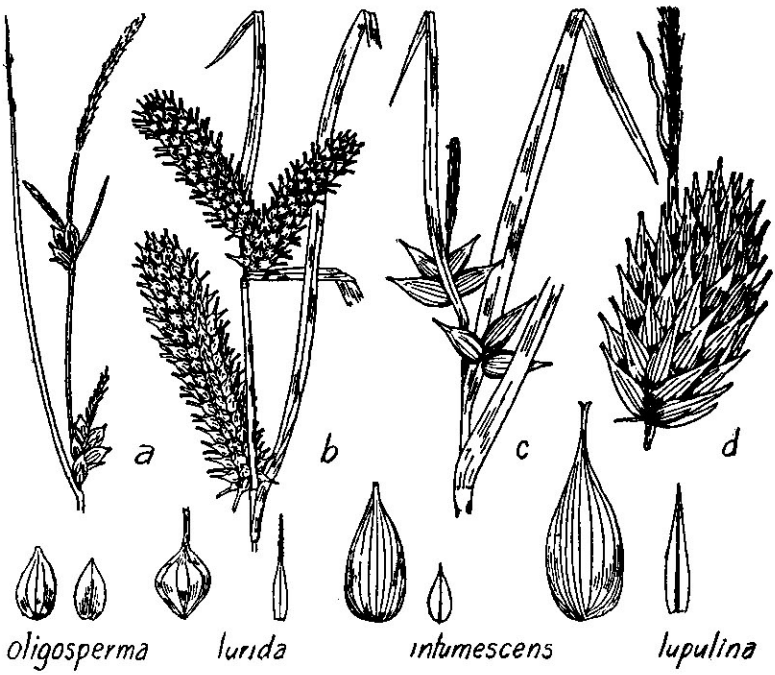
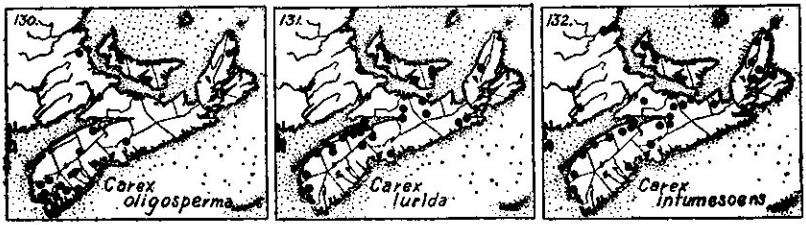


Fig. 30.—**Carex**: inflorescences, x 1; perigynia and scales, x 2.

SECT. 36. LUPULINAE

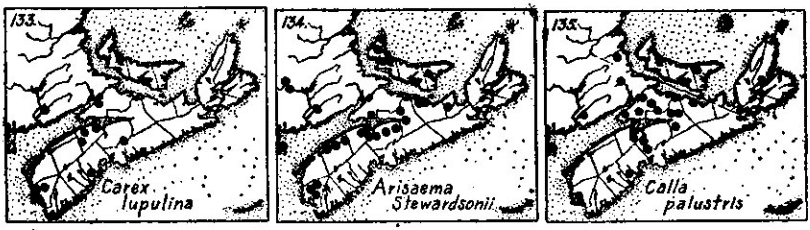
a. Pistillate spikes globose with 1-15 perigynia; perigynia spreading to reflexed, the sides of the beak usually smooth, the teeth hispid within.
b. Achenes ellipsoid, broadest near the middle and tapering to the beak; perigynia ovoid and distended, 5-8 mm wide. 94. *C. intumescens*
b. Achenes obovoid, broadest near the summit and gradually to broadly rounded to the beak. *C. intumescens* var. *Fernaldii*
a. Pistillate spikes oblong to cylindrical with 20-75 perigynia; perigynia closely appressed, the teeth smooth within. 95. *C. lupulina*



94. **C. intumescens** Rudge, see Fernald, Rhodora **44**: 321-322. 1942. Map 132. Fig. 30.

Scattered to frequent throughout; wet, usually deciduous, woods, in swamps and at edges of intervales. Var. **Fernaldii** Bailey is commoner than the species, and is occasionally found with inflated perigynia like the species. This is called forma *ventriosa* Fern.

Nfld. to Minn. south to N.S., N.Y., and in the mts. to N.C., with the species ranging south to Fla. & Tex.



95. **C. lupulina** Muhl. Map 133. Fig. 30.

Scattered to local; local in Yarmouth Co., occasional in Kings and Cumberland Cos.; mucky meadows, along intervales and in rich swales.

N.S. to Ont. & Mich. south to Fla. & Tex.

19. ARACEAE ARUM FAMILY

a. Leaves broad; spathe or leaf near the flowers, wide and thin.
  b. Spathe leafy, surrounding or arching over the spadix.
    c. Spadix or flowering spike, elongated with the upper part not flowering; leaves with 3 leaflets. 1. *Arisaema*
    c. Spadix thick, without a sterile end, nearly sessile on the ground; leaves ovate or heart-shaped, not divided; early spring. 3. *Symplocarpus*
  b. Spathe white and flat, behind the spadix. 2. *Calla*
a. Leaves narrow and sword-like; spathe like a continuation of the stem; spadix cylindrical, borne on the side of the 2-edged stem. 4. *Acorus*

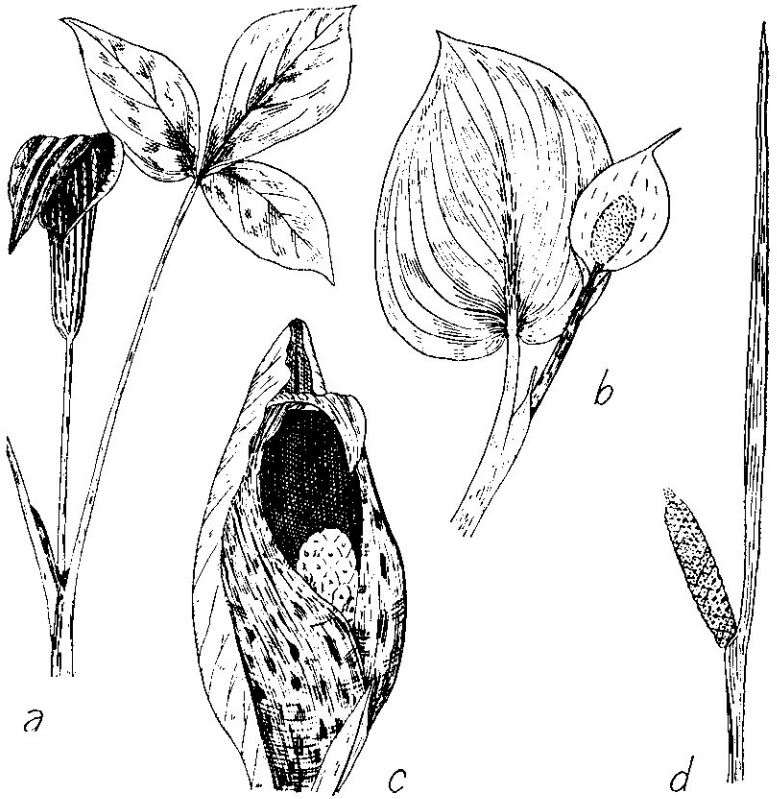


Fig. 31.—**Arisaema.** a, plant, x ½. **Calla.** b, plant, x ½. **Symplocarpus.** c, flowering plant, x ½. **Acorus.** d, upper third of plant, x ½.

I. **ARISAEMA** Martius

1. **A. Stewardsonii** Britt., see Fernald, Rhodora **42**: 247-254. 1940. JACK-IN-THE-PULPIT. Map 134. Fig. 31, a.

Rich low woods, mucky areas usually in thickets, or along the edge of stream intervales; rather common from Yarmouth east along the northern half of the province. All Maritime material seen belongs here. [*A triphyllum* (*L.*) Schott of Gray's Man. in part].

N.S. & P.E.I. to Minn. south to N.J. & Penn.

2 **CALLA** L.

1. **C. palustris** L. WATER ARUM. Map 135. Fig. 31, b.

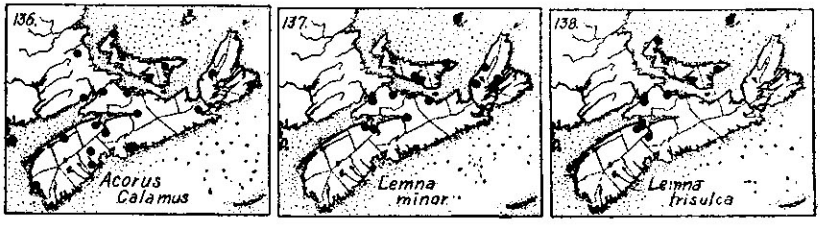
Rare in western N.S.; known only from the quaking margin of Trefry's L., Arcadia; scattered in bogs in the Annapolis Valley; common in the bogs and edges of lakes in sphagnum in the granitic and quartzite areas; rare or absent in C.B. June 15-July.

Cold bogs; N.S. to Hudson Bay & Minn. south to Penn., Wisc. & Iowa; Eurasia.

3. **SYMPLOCARPUS** Salisb.

1. **S. foetidus** (L.)Nutt. SKUNK CABBAGE Fig. 31, c.

Found only in the southwest from Digby Co. and Digby Neck south to southern Yarmouth Co.; springy swales,



open bogs, mossy sphagnum woods and wet thickets. May.

N.S. to Minn. south to Ga. & Iowa.

4. **ACORUS** L.

1. **A. Calamus** (L.) SWEET FLAG CALAMUS. Map 136. Fig. 31, d.

Throughout, most abundant in the northern counties; often abundant in marshes, along rivers, shallow edges of ponds and wet meadows where the bases of the plants are continually submersed; always in open sunlight, often crowded out by the growth of cat-tails which prefer much the same habitat. It is especially abundant just above high tide near Kentville and Truro.

N.S. to Minn. south to Fla. & Tex.; Eurasia.

20. **LEMNACEAE** DUCKWEED FAMILY

a. Plants with several roots, reddish beneath, almost round, 3-8 mm long. 1. *Spirodela*

a. Plants with a single root, oval or elongated, green beneath. 2. *Lemna*

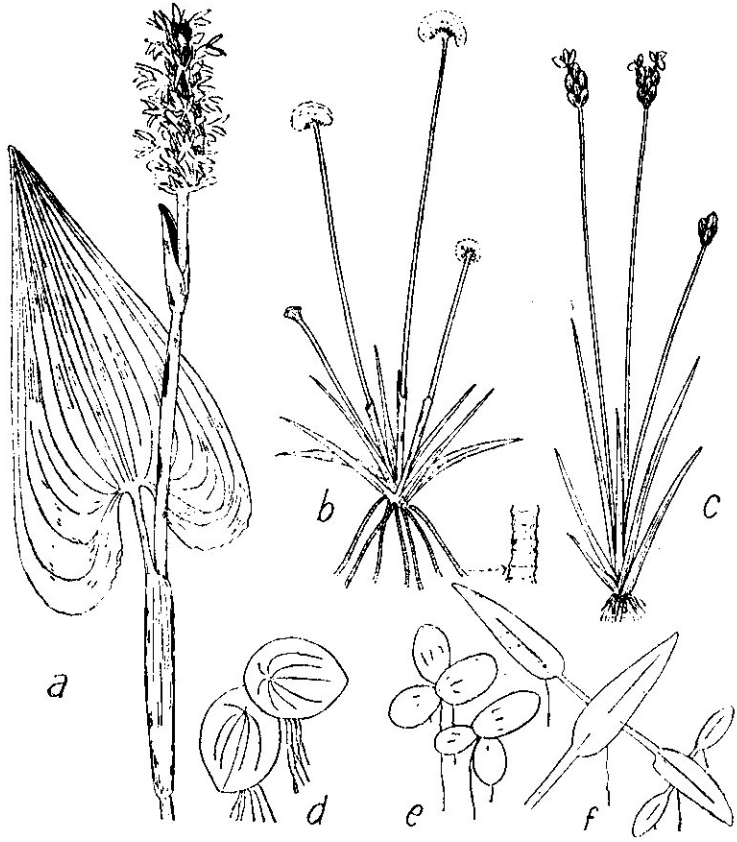


Fig. 32.—**Pontederia.** a, plant x ½. **Eriocaulon.** b, plant, x 1. **Xyris.** c, **X. montana,** x ½. **Spirodela.** d, plants, x 2. **Lemna.** e, **L. minor,** x 2. f, **L. trisulca,** x 2.

1. **SPIRODELA** Schleid.

1. **S. polyrhiza** (L.)Schleid. GREATER DUCKWEED. Fig. 32, d.

Common on the surface of the water in streams and in ponds, in Kings and Cumberland Cos.; scattered elsewhere in eastern N.S. & P.E.I.: Tracadie, Mabou and near Louisburg.

N.S. to B.C. south to Fla. & Calif; tropical America and Eurasia.

2. **LEMNA** L.

a. Plant roundish, 2-5 mm in diam., floating on the surface of the water 1. *L. minor*

a. Plant long and narrow with the new plants stalked, 6-10 mm long often sinking below the surface. 2. *L. trisulca*

1. **L. minor** L. LESSER DUCKWEED. Map 137. Fig. 32, e.

Common in stagnant pools, running brooks and ponds, often forming a greenish film over the surface; Annapolis Co. to C.B., often found until late October.

Throughout the world except in the colder regions.

2. **L. trisulca** L. SUBMERSED DUCKWEED. Map 138. Fig. 32, f.

Scattered in springs, flowing brooks and weedy pools, often submerged and on this account probably much overlooked. It is scattered in the Annapolis Valley and in Cumberland Co.

N.S. to B.C. south to Fla. & Calif.; Eurasia, Africa and Australia.

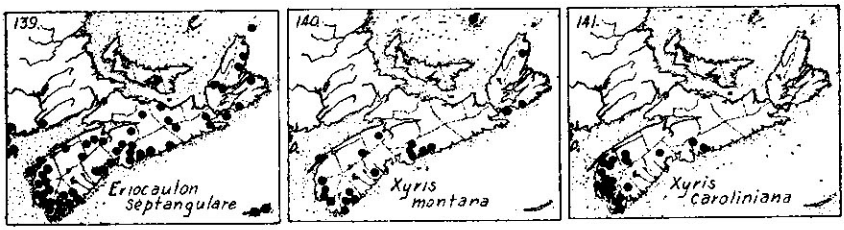
21. **ERIOCAULACEAE** PIPEWORT FAMILY

1. **ERIOCAULON** (Gronov.) L.

1. **E. septangulare** With., see Rhodora **11**: 40-41. 1909. PIPEWORT. Map 139. Fig. 32, b.

Common on sandy lake shores, rarely in running water; commonest in the southwestern and Atlantic regions. Sterile plants often form a green growth on the bottom of lakes as much as 2 m below the surface. The plant may be distinguished by its banded roots. July 15-Sept. (*E. articulatum* (Huds.) Morong).

Nfld. to Minn. south to N.J. & Ind.; western Scotland and Ireland.



22. **XYRIDACEAE** YELLOW-EYED GRASS FAMILY

1. **XYRIS** (Gronov.) L.

a. Plants rarely as much as 3 dm high; leaves 2-6 cm long and 1-2 mm wide, ⅓ to ½ the length of the flowering scape; scales of the head dark brown; fruiting heads 4-6 mm thick. 1. *X. montana*

a. Plants 0.5-3 dm high; leaves to 2 dm long and 4 mm wide, more than half the length of the flowering scape; fruiting heads 8-10 mm thick, with the scales having a greenish area in the center. 2. *X. caroliniana*

1. **X. montana** Ries. YELLOW-EYED GRASS. Map 140. Fig. 32, c.

Characteristic of peaty hollows, boggy barrens, sand flats and lake margins; common in the southwestern areas and east along the coast to Isle Madame; scattered and becoming rare inland and northward. July, Aug.

Nfld. to Penn. west to Wisc.

2. **X. caroliniana** Walt. Map 141.

Common from Digby to Shelburne Co., scattered east to Musquodoboit Harbour in Halifax Co.; wet, sandy, gravelly or peaty lake-margins, and sloughs in peaty barrens, often growing with the preceeding species.

N.S. & Me. to Fla. & La.; also in northern Ind. & Mich.

23. **PONTEDERIACEAE** PICKEREL-WEED FAMILY

1. **PONTEDERIA** L.

1. **P. cordata** L. PICKEREL-WEED. Map 142. Fig. 32, a.

Abundant in the southwestern area, frequent in lakes in Guysborough Co., scattered eastward and northward. It

generally grows in large pure colonies around the mucky margins of ponds and lakes, along slow-moving streams or at the edge of pond-holes. Forma *angustifolia* (Pursh) Solms is a narrow-leaved form which is found throughout the range of the species. July-Sept.

N.S. to Minn. south to Va. & Tex.

24. **JUNCACEAE** RUSH FAMILY *

a. Capsule 1- or 3-celled, many-seeded; plant never hairy; leaf-blades round, channelled down inside, or flat, when flat seldom exceeding 1 mm in width (except in *J. marginatus*). 1. *Juncus*

a. Capsule 1-celled, 3-seeded; plant more or less hairy; leaf-blades flat, the basal ones seldom less than 2 mm wide. 2. *Luzula*

1. **JUNCUS** (Tourn.) L. RUSH

a. Inflorescence appearing lateral, the involucral leaf seeming a continuation of the stem (Fig. 33).
  b. Stamens 3; stems in dense clumps.
    c. Inflorescence generally compact, 1-4 cm in diam.; sepals 1.7-2.6 (rarely 2.9) mm long; perianth somewhat spreading.
      d. Sheaths at base of stem pale, brownish below; stem 1.5-4.0 mm in diam. at top of sheath.
        e. Stem finely lined, usually deep green; capsule not mucronate; bractlet below the individual flower broad-ovate. 9. *J. effusus* var. *compactus*
        e. Stem 12-15-ridged just below the inflorescence, usually pale green; capsule often mucronate; bractlet below the individual flower lanceolate. 9. *J. effusus* var. *conglomeratus*
      d. Sheaths darker, purplish or reddish brown at base; stem 1-2 mm in diam. at top of sheath (rarely greater). 9. *J. effusus* var. *decipiens*
    c. Inflorescence usually diffuse, up to 14 cm in diam.; sepals 2.2-4.3 mm long; perianth somewhat appressed.
      f. Sheaths purplish or reddish brown at base; capsule not exceeding the sepals but darker and contrasting with them in color; stem commonly ridged.
        g. Sepals exceeding both petals and capsule, 3.0-4.3 mm long. 9. *J. effusus* var. *Pylaei*
        g. Sepals and petals equal, 2.2-3.0 mm long; capsule equalling or only slightly shorter than the perianth. 9. *J. effusus* var. *costulatus*

* The text for this family has been written with the assistance of Eville Gorham, Dalhousie University.

f. Sheaths pale brown; capsule exceeding the perianth but not contrasting in color; sepals and petals equal, 2.5-3.5 mm long; stem not ridged. 9. *J. effusus* var. *solutus*

b. Stamens 6; stems in rows from underground root-stocks.

h. Stem with the part above the flowers much shorter than that below; sepals and petals with lateral dark brown bands, 3.5-5.0 mm long; anthers much longer than the filaments; capsule brown to blackish; seeds about 1 mm long (Fig. 33). 7. *J. balticus*

h. Stem with the part above the flowers about equalling that below; flowers greenish to light brown, 2-3 mm long; anthers shorter than the filaments; capsule yellowish brown; seeds about 0.5 mm long (Fig. 33). 8. *J. filiformis*

a. Inflorescence terminal, subtended by an involucral leaf which may or may not exceed the inflorescence.

i. Leaf-blade flat, or round and channeled; never hollow nor partitioned by cross-walls.

j. Plant annual; inflorescence about one-half the total height.

k. Sepals and petals long-attenuate, much exceeding the greenish white or pale brown capsule; flowers scattered singly along the branches; seeds tapering, pointed at both ends (Fig. 33). 1. *J. bufonius*

k. Petals blunter, not long-attenuate, shorter than or but slightly exceeding the usually darker brown capsule; flowers often in pairs; seeds mostly truncate at one or both ends; plants of halophytic habitat, often lower and more spreading. 1. *J. bufonius* var. *halophilus*

j. Plant perennial; inflorescence less than one-quarter the total height of the plant.

l. Flowers subtended by bracteoles in addition to the bractlet at the base of the pedicel, scattered, not in compact heads.

m. Sepals blunt, green with lateral brown bands; leaf-sheaths covering one-half of the stem.

n. Plant of halophytic habitat, not glaucous; anthers about twice as long as the filaments; capsule ellipsoid-ovoid, as long as or slightly exceeding the perianth (Fig. 33). 2. *J. Gerardi*

n. Plant not halophytic, glaucous; anthers as long as the filaments; capsule globose, ovoid, exceeding the perianth. 3. *J. compressus*

m. Sepals acute, without lateral dark brown bands; leaf-sheaths covering one-quarter of the stem at most.

o. Capsule not exceeding the sepals, yellowish or brownish; leaf-blade flat.

p. Lobes at the top of the leaf-sheath quite conspicuous, whitish and membranous; anthers much shorter than the filaments (Fig. 33). 4. *J. tenuis*

p. Lobes inconspicuous, brown and cartilaginous; anthers only slightly shorter than the filaments. 5. *J. Dudleyi*

o. Capsule distinctly exceeding the sepals, shining, reddish brown; leaf-blade round, channelled on the upper side. 6. *J. Greenei*

y. Stems slender, sometimes reclining; elongate thread-like leaves never present; stem-leaves seldom exceeding the spreading inflorescence; capsule exceeding the sepals; anthers not exceeding the filaments (Fig. 35).

z. Capsule tapering, shiny, dark brown to nearly black, 3-4 mm long; flowers brown, 2.5-3.0 mm long (Fig. 34).
18. *J. articulatus*

z. Capsule abruptly mucronate, 2.5-3.0 mm long, often duller and paler; flowers often greenish, smaller.
18. J. *articulatus* var. *obtusatus*

x. Stem 0.5-2.5 dm high, usually bulbous at the base; cross-walls of the leaves inconspicuous; heads often bearing tufts of reduced leaves. 14. *J. bulbosus*

w. Heads mostly spherical; root-stock often bearing tubers; capsule subulate, exceeding the perianth (Fig. 34). 16. *J. nodosus*

v. Flowers solitary or in pairs along the branches of the inflorescence. Stem erect; inflorescence often bearing tufts of reduced leaves (Fig. 34). 13. *J. pelocarpus*

Stem prostrate; plant much reduced in all parts; inflorescence not being tufts of reduced leaves.
13. *J. pelocarpus* var. *sabulonensis*

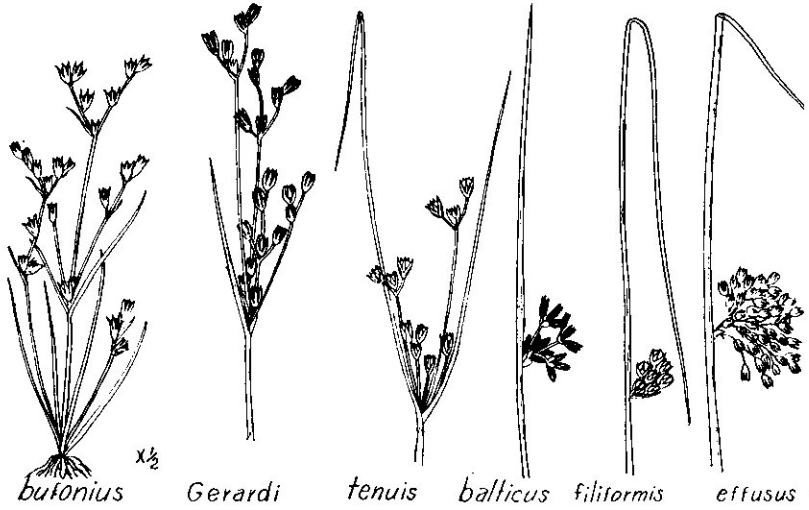


Fig. 33.—**Juncus.** Inflorescences, x ½.

1. **J. bufonius** L. TOAD-RUSH. Map 143. Fig. 33.

Common throughout; open areas, especially along roadsides, farm yards and beaten paths; scattered in wet land, lake-sides or boggy places. Widely distributed.

Var. **halophilus** Buch. & Fern. is scattered near the

l. Flowers with only the bractlet at the base of the short pedicel, in compact heads.

q. Capsule at most 3.5 mm long, about equalling the sepals: seeds about 0.5 mm long; heads more than 1 or 2, 3-12-flowered (Fig. 34). 20. *J. marginatus*

q. Capsule 6-9 mm long, much exceeding the sepals; seeds 3-4 mm long; heads 1 or 2, 1-4-flowered. 19. *J. stygius*

i. Leaf-blade round and hollow, paritioned by cross-walls (to show this, dissection may be necessary in *J. bulbosus* and *J. pelocarpus*).

r. Stamens 3, seeds 0.3-1.8 mm long.

s. Seeds with definite white appendages, 0.8-2.0 mm long.

t. Heads mostly 2-7-flowered.

Perianth 2.5-3.5 mm long.

Capsule much exserted, deep brown, tapering to the tip; inflorescence rather small and narrow (Fig. 34). 10. *J. brevicaudatus*

Capsule little if at all exserted; inflorescence larger, 0.4-3 dm high, with branches partly spreading. 11. *J. canadensis* forma *apertus*

Perianth 3.4-5.0 mm long; capsule little if at all exserted, rather abruptly pointed; inflorescence with stiffly erect branches, 0.3-1.5 dm high. 11. *J. canadensis* var. *sparsiflorus*

t. Heads mostly many-flowered; inflorescence spreading.

Capsule abruptly short-pointed, little if at all exserted; perianth 2.5-4.0 mm long; seeds long-tailed, 1-2 mm long; stem stout (Fig. 35). 11. *J. canadensis*

Capsule tapering, conspicuously exserted; perianth 2-3 mm long; seeds scarcely 1 mm long, with only short white appendages. 12. *J. subcaudatus*

s. Seeds without definite white appendages 0.3-0.5 mm long.

u. Stem erect, or reclining and rooting at the nodes, 0.5-2.5 dm high, usually bulbous at the base; leaves with inconspicuous cross-walls; petals blunt; heads 4-15-flowered, often bearing tufts of reduced leaves. 14. *J. bulbosus*

u. Stem erect, mostly exceeding 2.5 dm in height, not bulbous; leaves few, with conspicuous cross-walls; petals acute; heads many-flowered. 17. *J. acuminatus*

r. Stamens 6; seeds 0.3-0.6 mm long.

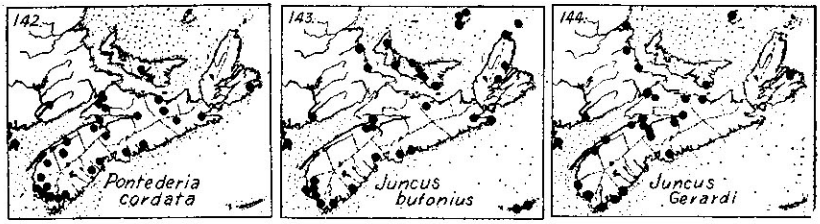
v. Flowers grouped in heads.

w. Heads not spherical; root-stock without tubers; capsule, if much exceeding the perianth, not subulate.

x. Stem 1.5-9.0 dm high, the base not bulbous; leaves with conspicuous cross-walls; heads without tufts of reduced leaves.

y. Stem stout, erect; elongate thread-like leaves sometimes borne in dense tufts on the root-stocks; lower stem-leaf overtopping the rather narrow inflorescence; capsule equalling the sepals; anthers longer than the filaments. 15 *J. militaris*

coast from the Gulf of St. Lawrence around C.B. and along the Atlantic Coast south to Mass.; West Coast.



2. **J. Gerardi** Loisel. BLACK-GRASS. Map 144. Fig. 33.

Common around the coast; on the upper limits of the salt marshes, often forming large pure colonies on flat brackish dykelands or in fields overflowed by the sea; forming a narrow band just below the area occupied by cultivated grasses and legumes.

Salt marshes near the Atlantic Coast; more rarely inland around the Great Lakes; Pacific Coast, Eurasia and N. Africa.

3. **J. compressus** Jacq.

The only record is that of Rousseau (1938); brackish meadow at Guysborough. It is an European species that has been introduced at various places in North America.

4. **J. tenuis** Willd., see Fernald, Rhodora 47:117-123. 1945. Fig. 33.

Abundant throughout; fields, roadsides, open thickets and moist places. Two forms are often found growing together. The typical plant has the flowers mostly clustered at the tips of the short floral branches. Var. **Williamsii** Fern. has the floral branches 3-6-flowered, 1-2 cm long, with the flowers scattered and on one side along them. (*J. macer* S. F. Gray).

Throughout N.A.; widely adventive elsewhere.

5. **J. Dudleyi** Wieg.

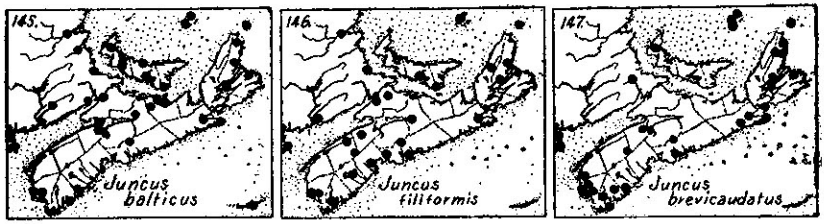
Rare; swale at the southern base of the North Mt., Middleton, Annapolis Co. (Fernald, 1921). It is also known from Grand Manan and at Bathurst in N.B.; and is scattered in eastern P.E.I.

Nfld. to Sask. south to Va., Kans. & Mex.

6. **J. Greenei** Oakes & Tuckerm.

Known from but one station; dunes at Villagedale, Shelburne Co.

N.S. Me. to Vt. & N.J.; locally in the Great Lakes region.



7. **J. balticus** Willd., var. **littoralis** Engelm. Map 145. Fig. 33.

Common around the coast, dominant sometimes in the shoreward reaches of the salt marshes; occasionally found in wet meadows or dykelands near the coast, and rarely in bogs in the same zone. Forma **dissitiflorus** Engelm., Rhodora **25**: 208. 1923, with the inflorescence diffuse, remotely-flowered, 4-15 cm long, is reported from a sphagnous hill-side at Truro; probably scattered.

Along the coast south to Penn.; inland in brackish places, around the Great Lakes and west to the Pacific.

8. **J. filiformis** L. Map 146. Fig. 33.

Scattered throughout; swales, bogs, edges of lakes, low meadows and sandy shores.

Lab. to B.C. south to Penn., Wisc & Colo.

9. **J. effusus** L. SOFT-RUSH Fig. 33.

Abundant and extremely variable. Var. **compactus** Lejeune & Court. is common throughout, abundant northeastward. Var. **conglomeratus** (L) Engelm., see Rhodora **12**: 85. 1910, is not well known. It is locally abundant in Shelburne Co. (Fernald, 1922). Older records are dubious. Var. **decipiens** Buch. is scattered, at least in western N.S. Var. **Pylaei** (Laharpe) Fern & Wieg., Rhodora **12**: 92. 1910, is found in open swampy thickets near Baddeck; swales near Uniacke Lake in Hants Co.; probably more common. Var. **costulatus** Fern., Rhodora **23**: 239-240. 1921, is scattered with the distribution unknown. Var. **solutus** Fern. & Wieg., Rhodora **12**: 90. 1910, is occasional in Kings Co. probably scattered.

The typical form of the species is unknown in N.A. while the varieties are widely distributed.

10. **J. brevicaudatus** (Engelm.)Fern. Map 147. Fig. 34.

Common in moist damp places throughout; ditches, periodic ponds, swamps, estuaries, and sandy or rocky lake- and pond-beaches.

Nfld. to Minn south to Conn., Penn. & W. Va.

11. **J. canadensis** J. Gay Fig. 35. See Fernald, Rhodora **47**: 127-131,1945.

Common to abundant throughout; wet, sandy or peaty soils, marshy places and shallow water. N.S. to Minn. south to Ga. & La. Forma **apertus** Fern. is scattered in the range of the species.

Var. **sparsiflorus** Fern., Rhodora **23**: 241. 1921, is found around some of the lakes in the Tusket River Valley and sparingly elsewhere in the southwestern counties. Nfld. N.S. & Mass.

12. **J. subcaudatus** (Engelm.) Coville & Blake, var. **planisepalus** Fern., Rhodora **23**: 241. 1921. Map 148.

Characteristic of wet boggy woods and openings in spruce swamps in southwestern N.S.; found east to Kings Co. and Halifax Co., and with one collection known from Pictou. This is apparently an endemic N.S. variety of the southern species which ranges northward to Cape Cod.

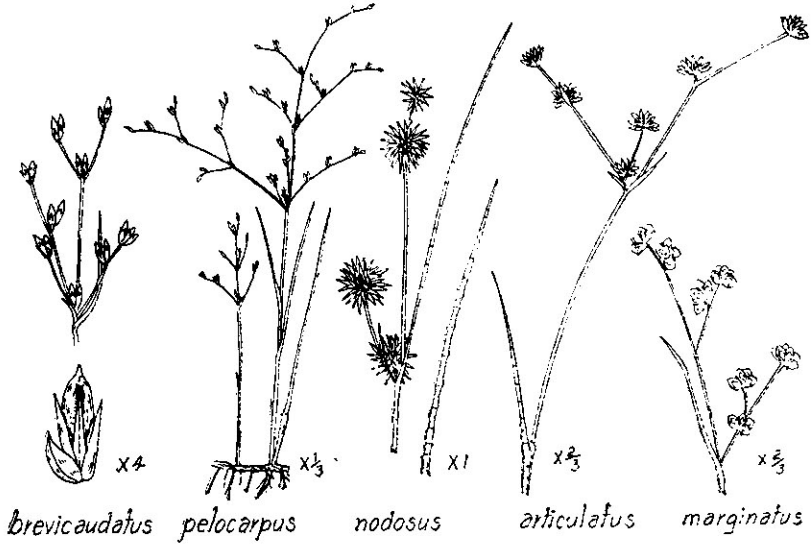


Fig. 34.—Juncus.

13. **J. pelocarpus** Meyer. Map 149. Fig. 34.

Sandy and muddy shores, bogs and wet roadsides; common to abundant in the western counties, scattered elsewhere to northern C.B. Nfld. to N.J. west to Minn.

Var. **sabulonensis** St. John, Proc. Boston Soc. Nat. Hist. **36**: 67. 1921, is a much reduced, prostrate variety that is known only from Sable Island; shallow ponds and wet dune hollows.

14. **J. bulbosus** L.

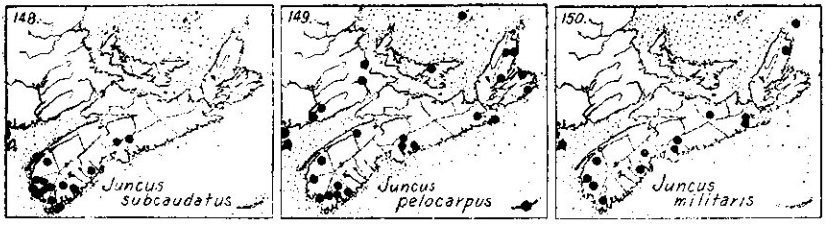
Common along the marshy borders of fresh-water ponds on Sable Island; not known on the mainland.

Eu.; Iceland, southern Nfld., Sable Is. and eastern Mass.

15. **J. militaris** Bigel. Map 150. Fig. 35.

Sandy and peaty lake-margins in the siliceous region from Yarmouth to northern C.B.; rare or absent in the northern counties. Two minor forms, Rhodora **24**: 166. 1922, have been reported. Froma **bifrons** Fern. has two leaf-blades on the culm, with no upper bladeless leaf-sheath; forma **subnudus** Fern. has one leaf-blade and no bladeless sheath; while the typical form has one leaf-blade near the middle of the culm and a bladeless sheath nearer the top.

N.S. to N.Y. & Ala.



16. **J. nodosus** L. Map 151. Fig. 34.

Swales near Wentworth gypsum quarries; Windsor; Truro and scattered in Cape Breton.

Muddy shores; Nfld. to B.C. south to Va. & Nebr.

17. **J. acuminatus** Michx. Map 151.

Local in Yarmouth Co., east to Kings and Lunenburg Cos.; wet clayey roadsides, sterile meadows, wet roadsides and ditches; sandy and muddy flats of the Tusket R. The records in Lindsay's Catalog are apparently erroneous; and his specimens are immature and indeterminable.

N.S. to Minn. south to Ga. & Tex.

18. **J. articulatus** L. Fig. 34.

One of the commonest species throughout; wet ditches and muddy shores, low areas in fields, swamps and boggy land. Nfld. to Mich. & B.C. south to Mass. & N.Y.; Eurasia.

Hybrids with *J. brevicaudatus* (X *J. fulvescens* Fern. Rhodora **35**: 236. 1933) are abundant in peaty swales at Yarmouth, at Argyle, and on a savannah near Tiddville, in every place failing to set fruit (Fernald, 1921). Hybrids with *J. nodosus* were noticed in brackish swale at Baddeck; and with *J. canadensis* at Tiddville, Digby Co., and at Lower Argyle, Yarmouth Co. (Fernald, 1921).

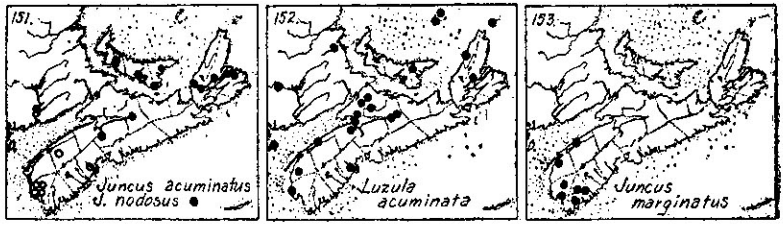
J. alpinus Vill., var. *insignis* Fries has been recorded from Truro and on sand, Liscomb R., Guysborough Co. (Macoun, 1888). No substantiating specimens have been seen, and since the interpretation of *J. alpinus* and its varieties has changed (See Rhodora **35**: 233-235. 1935), the exact indentities of these plants cannot be determined. This species resembles *J. articulatus* but can be distinguished by its narrow ascending inflorescence and blunt, sometimes mucronate, sepals.

Var. **obtusatus** Engelm. is common throughout, especially in brackish soil, where it largely replaces the typical form.

19. **J. stygius** L., var. **americanus** Buch.

One specimen from N.S. is in the Gray Herbarium at Harvard; bog thicket, Isle Madame, Cape Breton. J.A. Allen 21, VII, 1882.

Nfld. & Lab. to Ont. south to N.S., N.Y. & Minn.



20. **J. marginatus** Rostk. Map 153. Fig. 34.

Local in Yarmouth and Shelburne Cos., north to Belle Isle, Annapolis Co.; clayey brooksides, spring ditches, wet roadsides and fields.

N.S. to Neb. south to Fla.

2. LUZULA DC. WOOD RUSH

Fernald, M.L. Notes on eastern American *Luzula*. Rhodora **47**: 265-271. 1945. Fernald and Wiegand. The variations of *Luzula campestris* in North America. Rhodora. **15**: 38-43. 1913.

a. Flowers solitary at the tips of the ultimate branches of the inflorescence (Fig. 35).

b. Inflorescence an umbel, the rays unbranched; spikelets 3-4.5 mm long; plants 2-4 dm high. 1. *L. acuminata*

b. Inflorescence a decompound cyme, the rays repeatedly branched; spikelets 2 mm long; plants 6-12 dm high. 2. *L. parviflora*

a. Flowers aggregated in heads or spikes.

c. Perianth 2.5-3.5 mm long, equalling or usually shorter than the mature capsule; seeds 1.5-2.0 mm long, with a round-tipped bulb-like caruncle.

d. Leaves longer and flexuous, to 5 mm wide; sepals and capsules mostly pale or straw-colored. 3. *L. multiflora*

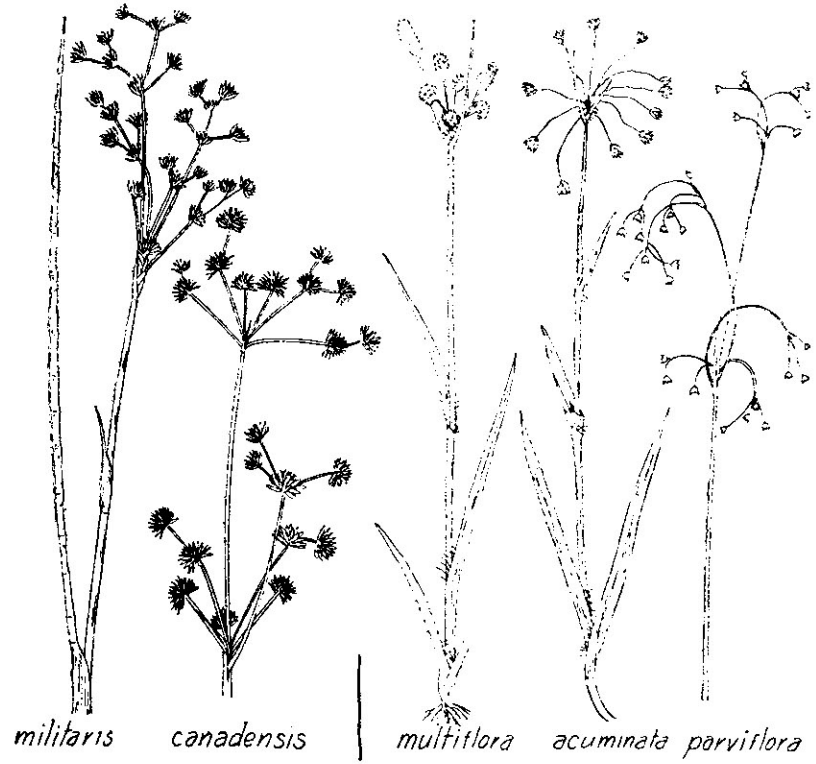


Fig. 35.—Juncus, x ½, Luzula; x ½.

d. Leaves stiff and narrow; sepals dark-brown to fulvous; capsules dark chestnut to blackish; plant low, found near the coast. *L. multiflora* var. *fusconigra*

c. Perianth 3-4 mm long, greatly exceeding the capsule; seeds 1.5-1.7 mm long, with a conically tapering caruncle; inflorescence more condensed with the spikes sessile or subsessile. *L. multiflora* var. *acadiensis*

1. **L. acuminata** Raf., see Fernald, Rhodora **46**:. 4. 1944. Map 152. Fig. 35.

Scattered to common throughout; banks, thickets, and in deciduous or mixed woods. May. (*L. saltuensis* Fern. *Juncoides Carolinae*).

Nfld. to Sask. south to N.J., Ga., Ind. & Minn. Eurasia.

2. **L. parviflora** (Ehrh.) Desv. Fig. 35.

Scattered along the rocky stream-banks or on cliffs in northern C.B.; collected by Nichols in the Valley of the Barrachois R., and common around Bay St. Lawrence, Victoria Co.

Labrador to Alaska south to N.S., Me., N.Y. and south in the Rockies.

3. **L. multiflora** (Retz.) Lejeune, see Hermann, Rhodora **40**: 83-84. 1938. COMMON WOODRUSH Fig. 35.

Abundant throughout; fields, thickets, barrens and open woods. (*Luzula campestris* var. *multiflora*. *Juncoides campestre*). Nfld. to Alaska south, to N.J., Ill. and Calif.; Eurasia.

Var. **fusconigra** Celak is a more dwarf, stiffer form with blackish inflorescence and capsules. It is found mostly near the coast from the strait of Belle Isle to Mass.; inward on the mts. of N.Y. Shag Harbour and elsewhere along the coast of N.S.

Var. **acadiensis** (Fern.) Fern., Rhodora **47**: 267. 1945. This plant, originally described from P.E.I. (Rhodora **19**: 38. 1917), is rather rare in the northern parts of the province. It is common, and the only variety, on Sable Island. A collection from St. Paul Island, originally referred to var. *comosa*, is considered to belong here.

25. LILIACEAE LILY FAMILY

a. Leaves all nearly or quite basal, or absent at flowering time.

b. Flowers 8-11 cm long, orange; leaves linear, 5-20 dm long (Fig. 36, d) 5. *Hemerocallis*

b. Flowers much smaller, not orange; leaves less than 3 dm long.
c. Flowers solitary, yellow, 2-3 cm long; leaves elliptical, mottled with purple (Fig. 36, f). 7. *Erythronium*
c. Flowers several to many, less than 2 cm long; leaves not mottled.
d. Leaves linear or absent at flowering time.
e. Plants with a strong onion-like odor; leaves fleshy; flowers numerous, in umbels. 4. *Allium*
e. Plants without a strong odor; leaves grass-like; flowers not in umbels.
f. Flowers crowded in a short narrow raceme; top of the scape glutinous with dark glands. 1. *Tofieldia*
f. Flowers 3-8 in an open corymb; top of the scape smooth. 8. *Ornithogalum*
d. Leaves oval to elliptical, present at flowering time.
g. Flowers yellow, in a 3-6-flowered umbel; perianth-parts separate (Fig. 36, e). 10. *Clintonia*
g. Flowers white, several, in a one-sided raceme; perianth-parts united (Fig. 38, c). 15. *Convallaria*

a. Leaves in whorls or alternate on the stem.
h. Plant herbaceous, not trailing or climbing.
i. Leaves in one or more whorls upon the stem.
j. Whorls numerous; flowers 4-10 cm in diameter, orange spotted with brown (Fig. 37, a). 6. *Lilum*
j. Whorls one or two; flowers much smaller.
k. Leaves in two whorls, each whorl with 5-9 leaves; flowers yellow, incurved beneath the upper leaves. (Fig 37, b). 16. *Medeola*
k. Leaves 3, in a single whorl; flowers white to purple (Fig. 37, d-f). 17. *Trillium*
i. Leaves alternate upon the stem.
l. Flowers numerous, in a terminal inflorescence.
m. Flowers green; inflorescence 1-4 dm long; leaves oval, 1-3 dm long, plaited, clasping the stem; rare. 2. *Verdtrum*
m. Flowers white; inflorescence rarely to 1 dm long; leaves much smaller, not plaited; common.
n. Perianth parts 6; leaves tapering to the base, 3-many (Fig. 37,c; 38, b). 11. *Smilacina*
n. Perianth parts 4; leaves heart-shaped at the base, 1-3 (Fig. 38,d) 12. *Maianthemum*
l. Flowers solitary or in 2's, terminal or scattered.
o. Flowers solitary to few on each plant, 15-45 mm long, yellowish, at first terminal then becoming lateral (Fig. 36, a). 3. *Uvularia*
o. Flowers numerous, much smaller.
p. Plants erect, 1-2 m high; stem finely branched, the smaller thread-like; leaves scale-like; flowers small, greenish white. 9. *Asparagus*

p. Plant arching, 1-2 dm high; stem unbranched or forking; leaves lanceolate to oval, over 10 mm wide.

q. Flowers bell-like, borne singly on a jointed stalk or rarely in pairs from just below each leaf; rootstock without prominent scars (Fig. 36, b, c). 13. *Streptopus*

q. Flowers cylindrical, the parts joined, in pairs upon a forked peduncle from the leaf axils; rootstock with prominent oval scars (Fig. 38, a). 14. *Polygonatum*

h. Plants trailing or climbing, woody and spiny; southwest N.S. only (Fig. 39, f). 18. *Smilax.*

1. **TOFIELDIA** Huds.

1. **T. glutinosa** (Michx.)Pers. FALSE ASPHODEL

Collected but once, by Dore in peaty and boggy soil from the region of Cheticamp.

Nfld. to Minn. & Alaska south to Me., N.C. & Ore.

Fig. 36.—**Uvularia.** a, plant, x 1/3. **Streptopus.** b, **S. amplexifolius,** x 1. c, **S. roseus** x ½. **Hemerocallis.** d, flower, x ½. **Clintonia.** e, plant, x 1/3. **Erythronium.** f, plant, x 1/3.

2. VERATRUM (Tourn.) L.

1. **V. viride** Ait. GREEN HELLEBORE

Reported but once, no specimen seen: west Halifax Co. (MacKay. N.S. Inst. Sci. 1904: 287).

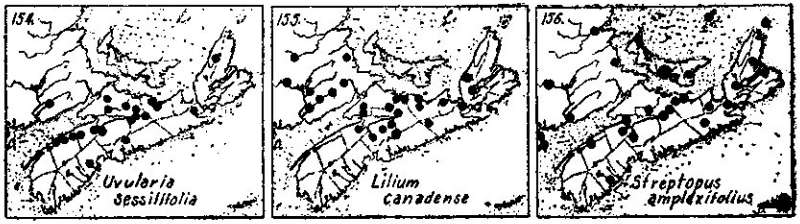
Swamps, wet woods and low pastures; N.B. to B.C. south to Ga. and Minn.

3. UVULARIA L.

1 **U. sessilifolia** L. BELLWORT Map. 154. Fig. 36, a.

Rich woodland or alluvial soils, usually in shade but often growing out into open meadows and hay-fields in the center of the province; Annapolis and Cumberland Cos. to C.B., occasionally southward. May 20-June 15. (Oakesia).

N.S. to Minn. south to Ga.



4. ALLIUM L. ONION

a. Flowers rose-colored; leaves linear and hollow, present at flowering time. 1. *A. Schoenoprasum*

a. Flowers white; leaves elliptic, 2-5 cm wide, appearing early and disappearing before flowering-time. 2. *A. tricoccum*

1. **A. Schoenoprasum** L., var. **sibiricum** (L.) Hartm. CHIVES.

Prest reports it along wet, low land near the sea-shore or rivers; Macoun found it in meadows near the sea at Yarmouth; and it is occasionally found around the sea-coast elsewhere. The garden plant is the introduced species.

Nfld. to Alaska south to northern N. Eng. & the Great Lakes.

2. **A. tricoccum** Ait. WILD LEEK

Luxuriant, in large crowded beds; rich sugar maple woods on the top of Cape Blomidon and in a rich intervale at Kemptown, Colchester Co.

N.S. to Minn. south to Ga. & Tenn.

5. **HEMEROCALLIS** L.

1. **H. fulva** L. TAWNY DAY LILY Fig. 36, d.

An occasional escape from gardens; it is found in large clumps along rocky roadsides, especially in the Annapolis Valley; scattered throughout.

Introduced from Eurasia; N.S. to Ont. south to N.C.

6. **LILIUM** (Tourn.) L.

1. **L. canadense** L. CANADA LILY Map 155. Fig. 37, a.

Meadows from Kings and Cumberland to C.B.; it is common around Truro and Mabou, scattered elsewhere. Early July.

N.S. to Minn. south to Ga.

7. **ERYTHRONIUM** L.

1. **E. americanum** Ker. DOG'S TOOTH VIOLET Fig. 36, f.

Upland woods of beech and maple and along the edges of intervales; common in Cumberland to C.B.; local in hardwoods on the Annapolis Valley slopes and best known around Gaspereau Valley and on the North Mt. Late May.

N.S. to Minn. south to Fla. & Tex.

8. **ORNITHOGALUM** (Tourn.) L.

1. **O. umbellatum** L. STAR-OF-BETHLEHEM

This slender garden perennial shows a tendency to escape around Yarmouth and neighboring regions; scattered around old dwellings. Early July.

Native of Eu.

9. **ASPARAGUS** (Tourn). L.

1. **A. officinalis** L. ASPARAGUS

Occasionally escaping to roadsides. In the Annapolis Valley it will persist for years in fields or orchards where it was once cultivated.

Native of Eu. and widely introduced.

10. **CLINTONIA** Raf.

1. **C. borealis** (Ait.) Raf. CLINTONIA Fig. 36, e.
Common throughout; deciduous or mixed woods. Early June.
Lab. to Man. south to N.C.

11. **SMILACINA** Desf.

a. Flowers numerous, minute, in a panicle; divisions of the perianth 1-2 mm long; plants 4-8 dm high, arching, from stout rootstocks; leaves numerous. 1. *S. racemosa*

a. Flowers few, larger, in a raceme; divisions of the perianth 3.5-5.5 mm long; plants 2-5 dm high, erect, from slender rootstocks.

b. Leaves 7-12, glaucous, broad and sub-clasping at the base; raceme sessile or nearly so. 2. *S. stellata*

b. Leaves 2-4, not glaucous, tapering to a sheathing base; raceme stalked. 3. *S. trifolia*

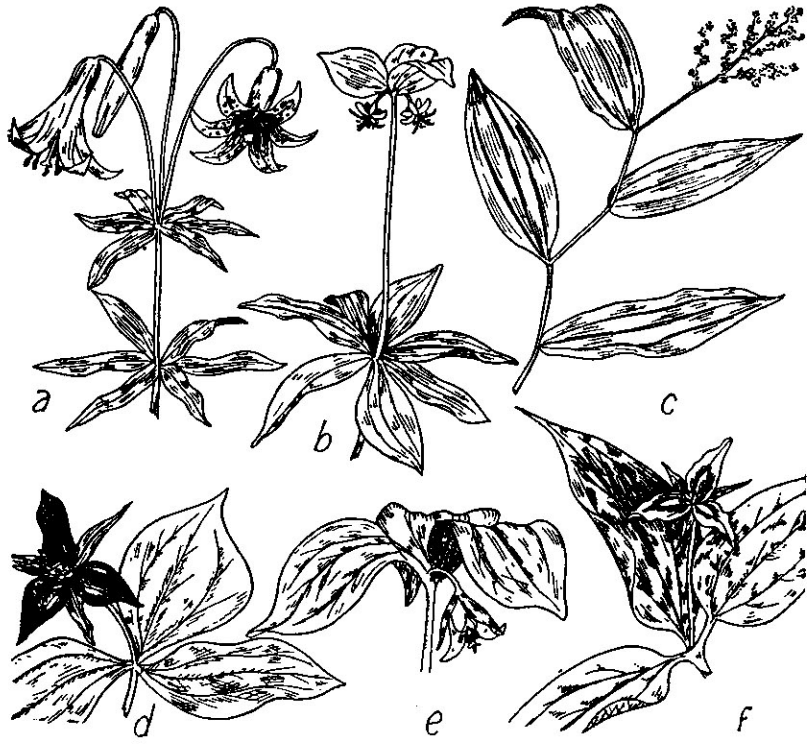


Fig. 37.—**Lilium.** a, top of plant, x ½. **Medeola.** b, top of plant, x ½. **Smilacina.** c, **S. racemosa**, x ½. **Trillium.** d, **T. erectum**, x ½. e, **T. cernuum**, x ½. f, **T. undulatum**, x ½.

1. **S. racemosa** (L.) Desf. FALSE SOLOMON'S SEAL Map. 157. Fig. 37, c.

Scattered in open deciduous woods, dryish roadsides and edges of thickets; rare in southwestern N.S. frequent northward. Forma **foliosa** Vict., Contrib. Inst. Bot. Univ. Montreal **14**: 15. 1929, is a minor form with the lowest branch of the panicle in the axil of the upper leaf. Bridgewater, and probably throughout the range.

N.S. to B.C. south to Ariz. and Tenn.

2. **S. stellata** (L.)Desf. STARRY FALSE SOLOMON'S SEAL Map. 158.

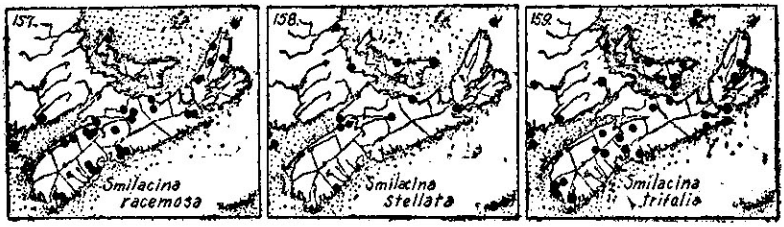
Rather rare around the coast on headlands or in marshes and wet meadows. Early July.

Lab. to B.C. south to Va. and Calif.; Eu.

3. **S. trifolia** (L.) Desf. THREE-LEAVED FALSE SOLOMON'S SEAL Map 159. Fig. 38, b.

Common in sphagnous bogs or wet meadows throughout; swamps, wet bogs and sphagnum mats in northern C.B., usually with the base of the plant buried in sphagnum moss; June-July 15.

Lab. to B.C. south to N.J.; Siberia.



12. **MAIANTHEMUM** Weber.

1. **M. canadense** Desf. WILD LILY-OF-THE-VALLEY. Fig. 38, d.

Common throughout; in a great variety of habitats, one of the first plants to appear under conifers. June.

Lab. to the Mackenzie south to the mts. of N.C.

13. **STREPTOPUS** Michx.

Fassett, Norman C. A study of *Streptopus*. Rhodora **37**: 88-113. 1935.

a. Nodes glabrous; leaves clasping at base, the margin smooth; flowers greenish-white; peduncles and pedicels smooth. 1. *S. amplexifolius*

a. Nodes fringed; leaves not clasping, the margins finely ciliate; flowers rose-purple; peduncles and pedicels ciliate. 2. *S. roseus*

1. **S. amplexifolius** (L)DC., var. **americanus** Schultes. GREEN TWISTED-STALK. Map 156. Fig. 36, c.

Scattered in moist deciduous or mixed woods, in ravines or on intervales; rare in the southwestern counties, common from Annapolis to northern C.B. June.

Greenland to N.Y. and west around the northern Great Lake region; Alaska to N.M.

2. **S. roseus** Michx., var. **perspectus** Fassett. ROSE TWISTED-STALK. Map 160. Fig. 36, b.

Scattered to common throughout; acid soils, coniferous woods and thickets. June.

Lab. & Nfld. to Mich. south to Penn. & N.C.

14. **POLYGONATUM** (Tourn.) Hill

1. **P. pubescens** (Willd.) Pursh. SOLOMON'S SEAL. Map 161. Fig. 38, a.

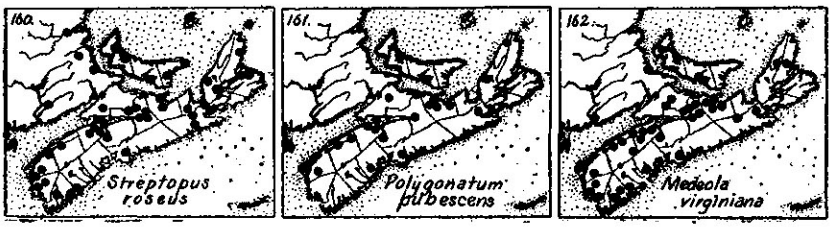
Rich deciduous woods; common from Annapolis to northern C.B.; scattered elsewhere and rare southwestward; intervales, ravines or in the richest thickets. June. (*P. biflorum*(Walt.)Ell.).

N.S. to Mich. south to Fla. & Tex.

15. **CONVALLARIA** L.

1. **C. majalis** L. LILY-OF-THE-VALLEY. Fig. 38, c.

This introduced garden plant persists or spreads in patches near old houses, cemeteries, or occasionally along roadsides in the more southern parts of the province. May.



16. **MEDEOLA** (Gronov.) L.

1. **M. virginiana** L. INDIAN CUCUMBER-ROOT. Map 162. Fig. 37, b.

Open deciduous woods or deciduous climax forest; throughout. It is usually scattered and on well-drained slopes, but areas have been seen with thousands of plants. June-July.

N.S. to Minn. south to Fla.

17. **TRILLIUM** L.

a. Leaflets tapering to the base and sessile, rounded at the tip and abruptly short-pointed.
  b. Flowers erect, dark-purple. 1. *T. erectum*
  b. Flowers recurved down under the leaves on a short stalk, pale pinkish. 2. *T. cernuum*
a. Leaflets with definite petioles about 1 cm long, rounded at the base and tapering to a slender tip; flowers erect, the petals white with pink-striped bases. 3. *T. undulatum*

1. **T. erectum** L. PURPLE TRILLIUM. Map 165. Fig. 37, d.

Common along the hardwood slopes of the Annapolis Valley, east at least to Pictou Co. It was not seen by the Gray Herbarium expedition west of Annapolis; and coll-

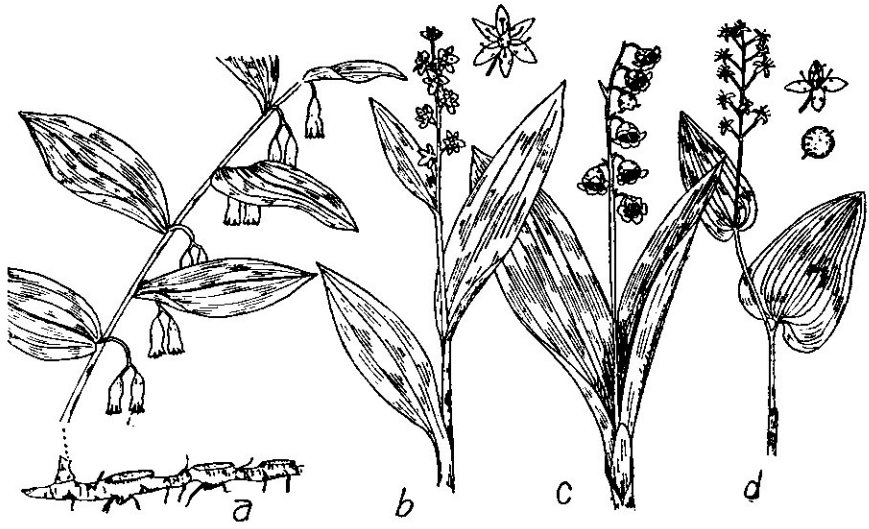


Fig. 38.—**Polygonatum.** a, top of plant, and rootstock, x ¼. **Smilacina.** b, **S. trifolia,** x ½. **Convallaria.** c, plant, x ½. **Maianthemum.** d, plant, x ½.

lections from the rest of the province are exceedingly few. A form with white or cream-colored corolla is named forma **albiflorum** R. Hoffm., Proc. Boston Soc. Nat. Hist. **36**: 244. 1922. The collection by Macoun from the North Mt., Annapolis, reported in his catalog as var. *album* belongs here. Early May.

N.S. to Ont. south to N.C.

2. **T. cernuum** L. NODDING TRILLIUM. Map 163. Fig. 37, e.

Kings and Lunenburg Cos. to Amherst and northern C.B.; alluvial soils, deciduous climax forest and flood plains. It is commonest on the rich intervales of Colchester and Pictou Cos. May 20-June 15.

Nfld. along the Atlantic Coast to Ga. east to Man.

3. **T. undulatum** Willd. PAINTED TRILLIUM. Map 164. Fig. 37, f.

Scattered to common throughout; little collected eastward; open dryish to rather rich woods and intervales. May 20-June 20.

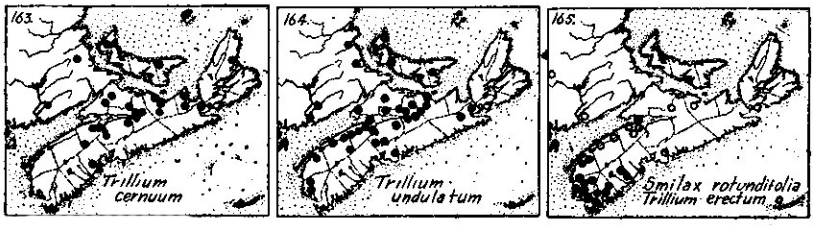
N.S. to Wisc. south to Ga.

18. **SMILAX** (Tourn.)L.

1. **S. rotundifolia** L. GREEN or CAT BRIER. Map 165. Fig. 39, f.

Thickets bordering lakes and rivers, often growing in dense tangles over shrubs; frequent from Weymouth south through Yarmouth Co. and Shelburne; along the Medway in Queens. Var. **quandangularis** (Muhl.) Wood has the margins of the leaf minutely ciliate-spinulose, with the branches more 4-angled. Frequent with the typical form or in separate colonies. Late June.

N.S. to Ga. and west to Minn.



26. HAEMODORACEAE BLOODWORT FAMILY

a. Stamens 3, exserted; ovary inferior; inflorescence hemi-spherical, 3-6 cm wide. 1. *Lachnanthes*

a. Stamens 6, included; ovary nearly superior; inflorescence loosely cymose, 5-10 cm wide, usually longer than wide. 2. *Lophiola*

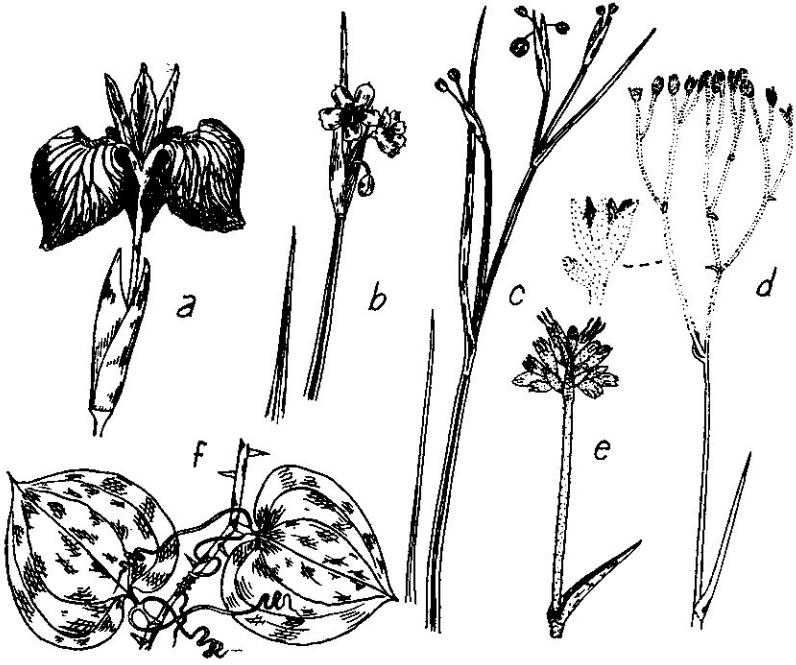


Fig. 39.—**Iris.** a, **I. versicolor,** flower, x 1/3. **Sisyrinchium.** b, **S. angustifolium,** top of plant, x ½. c, **S. atlanticum,** x ½. **Lachnanthes.** e, top of plant, x ½. **Lophiola.** d, top half, x ½. **Smilax.** f, part of plant, x ½.

1. LACHNANTHES ELL

1. **L. tinctoria** (Walt.) Ell. RED-ROOT. Fig. 39, e.

Very local; known only from the shores of Ponhook and Beartrap Lakes, Queens Co. where it was discovered by Weatherby (Rhodora **44**: 233. 1942). It grew on peaty shores or lake-side marshes on the north side of Ponhook Lake, associated with *Scirpus Longii*. July-Sept.

Sandy swamps: N.S. and Mass. south to Fla. near the coast.

2. **LOPHIOLA** Ker

1. **L. aurea** Ker-Gawl see Rhodora **24**: 167. 1922, and **45**: 512. 1943. GOLDEN CREST. Fig. 39, d.

Rare, known from but four stations: common in wet savannahs along Little River, west of Tiddville, Digby Neck; scattered in a meadow, southern end of Brier Is.; scattered for miles along the shore of Ponhook L.; Queens Co.; and common in a sphagnous boggy swale bordering Fancy L., Lunenburg Co. Aug.-early Sept. (*L. americana* (Pursh) Wood. *L. septentrionalis* Fern.).

N. S. and the pine barrens of N. J.

27. **IRIDACEAE** IRIS FAMILY

a. Stems 4-10 dm high, terete or nearly so; flowers 6-12 cm wide; plant with thick rootstocks. 1. *Iris*

a. Stems 1-5 dm high, winged; flowers less than 1 cm wide; plants with fibrous roots only. 2. *Sisyrinchium*

1. **IRIS** (Tourn.)L. IRIS

a. Flowers yellow; plant 10-15 dm high; capsules 50-70 mm long. 1. *I. pseudoacorus*

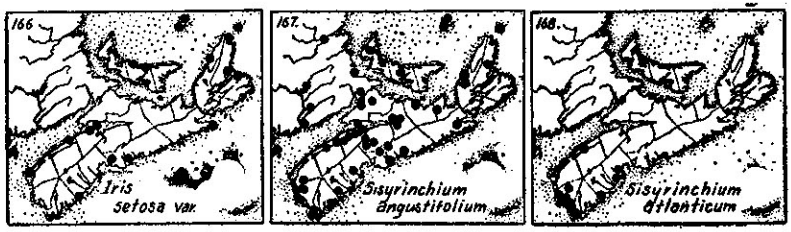
a. Flowers blue; plant 1-8 dm high; capsule shorter.

b. Capsule and ovary obtusely angled; leaves 5-30 mm wide; stem stout.

c. Leaves 5-30 mm wide; stem stout, angled on one side; petals flat, half as long as the sepals; capsule stout-beaked; seeds 4-6 mm wide, flattened on the side, raphe not apparent. 2. *I. versicolor*

c. Leaves 5-10 mm wide; stem slender, terete; petals tubular-pointed and one-quarter as long as the sepals; capsule blunt or barely tipped; seeds 2-3.5 mm wide, plump, with a prominent raphe. 3. *I. setosa*

b. Capsule and ovary sharply angled; leaves long and linear, 3-7 mm wide; stem very slender, terete. 4. *I. prismatica*



1. **I. pseudacorus** L. YELLOW IRIS

Well naturalized about pools and ditches near Yarmouth; found at Arcadia over thirty years ago; unknown elsewhere. Late June-July.

Introduced from Eu.; Nfld. to N.J.

2. **I. versicolor** L. BLUE-FLAG Fig. 39, a.

Common throughout; meadows, swamps, along streams and especially common in wet grazed pastures. June-July.

Lab. to Man. south to Fla.

3. **I. setosa** Pall., var. **canadensis** Foster. Map 166.

Found around the coast on beaches, exposed headlands and cliffs; common around C.B. and along the Bay of Fundy and scattered to rare elsewhere. July.

Lab. and Nfld. south to the coast of Me.

4. **I. prismatica** Pursh. SLENDER BLUE FLAG

Reported by Macoun as abundant in meadows at Louisburg; unknown elsewhere.

Wet ground or brackish swamps near the coast; N.S. to Ga.

2. SISYRINCHIUM L. BLUE-EYED GRASS

a. Spathe generally solitary and sessile at the culm; bracts composing the spathe unequal, the outer 2-6.5 cm long, the inner 1-3 cm long; stem 1.5-3 mm wide; pedicels equaling the inner bract or shorter. 1. *S. angustifolium*

a. Spathes generally 2 or more, peduncled from the axil of a leafy bract; bracts of the spathe nearly equal; pedicels longer than the inner bract.

b. Old leaf-bases persisting as tufts of brownish, fibrous bristles; plant stiff, usually blackening in drying; stem 1-3 mm wide. 2. *S. arenicola*

b. Old leaf-bases, if persistent, not forming tufts of fibrous bristles; plants not so stiff, not blackening in drying.

c. Inner bract of the spathe 10-15 mm long; stem slender and narrowly winged, 1-3 mm wide, tall and flexuous. 3. *S. atlanticum*,

c. Inner bract of the spathe 15-30 mm long; stem 2-4 mm wide broadly winged. 4. *S. graminoides*

1. **S. angustifolium** Mill. BLUE-EYED GRASS. Map 167. Fig. 39, b.

Very common throughout; fields, meadows, roadsides and open woods. The stem frequently may be branched. Late May-June. (*S. montanum* Greene, var. *crebrum* Fernald, in Rhodora 48: 159-160. 1946).

Nfld. to B.C. southward.

2. **S. arenicola** Bickn.

Rare; sandy plains or banks, Yarmouth and Middleton; on the shore of Grand Lake, Halifax Co. (Fernald, 1921).

N.S.; Mass. south along the coast to Va.

3. **S. atlanticum** Bickn. Map 168. Fig. 39, c.

Common from Yarmouth to Lunenburg Cos.; North Mt., Belle Isle, Annapolis Co.; damp, peaty, sandy or gravelly soil in grassy woods or in the open.

N.S to Fla., west to Ind. and Mich.

4. **S. graminoides** Bickn. Map 169.

Common in the same range and situations as the last; abundant and the only member of the genus on Sable Is. Occasionally the plant may have quite simple scapes thus appearing like *S. angustifolium*, but with paler blue flowers (*S. gramineum* in Gray's Man. *S. angustifolium* Mill. acc. to Fernald, Rhodora **48**: 152-158. 1946).

N.S. to Me. and Minn. south to Fla. & Tex.

28. **ORCHIDACEAE** ORCHID FAMILY

a. Flowers showy with the lip moccasin-shaped, 2-5 cm long; fertile anthers 2 (Fig. 40, a). 1. *Cypripedium*

a. Flowers smaller; lip not moccasin-shaped, often fringed; fertile anther 1.

b. Flowers with spurs more than 2 mm long, numerous in erect, loose or dense racemes (Fig. 40, b-d). 2. *Habenaria*

b. Flowers without conspicuous spurs.

c. Flowers showy, pink or rarely whitish, 1.5-4.5 cm long.

d. Leaves elliptical or oval; flowers solitary and terminal (Fig. 41, e). 3. *Pogonia*

d. Leaves linear or reduced to sheaths only.

e. Flowers several in a raceme; perianth-parts separate; leaf solitary, linear (Fig. 41, d). 4. *Calapogon*

e. Flower solitary, terminal; perianth-parts joined at the base; leaves reduced to scales (Fig. 41, c). 5. *Arethusa*

c. Flowers less than 1 cm long, few to many, not normally solitary.

f. Leaves reduced to bracts; plant reddish or yellowish, without chlorophyll (Fig. 41, a, b). 9. *Corallorhiza*

f. Leaves linear to oval; plant with green chlorophyll.

g. Flowers in a narrow, spiral or one-sided raceme, white or greenish; sepals and petals, except the lip, erect and forming a tube.

h. Lip not sac-shaped; leaves not variegated, oval and basal or linear and on the stem (Fig. 42, a, b). 6. *Spiranthes*

h. Lip sac-shaped; leaves basal,ovate to elliptical, variegated with white and green (Fig. 42, c). 7. *Goodyera*

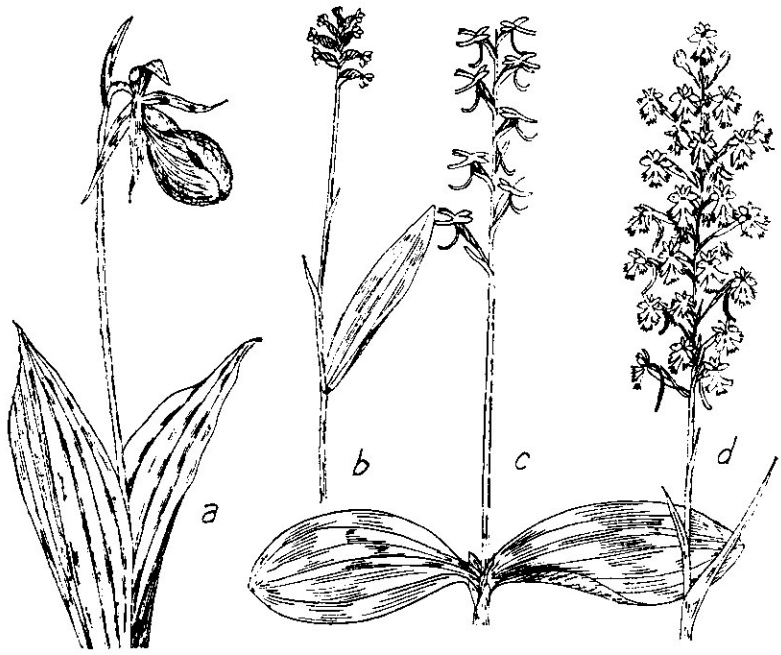


Fig. 40.—**Cypripedium.** a, **C. acaule,** x 1/3. **Habenaria.** b, **H. clavellata,** x 1/3. c, **H. Hookeri,** x 1/3. d, **H. psycodes,** x 1/3.

g. Flowers very small, greenish to pale purplish, in a short open raceme; sepals and petals separate, usually spreading.
i. Leaves two, opposite and conspicuous.
j. Leaves near the top of the stem (Fig. 42, f, g). 8. *Listera*
j. Leaves basal, sheathing the stem (Fig. 42, e). 11. *Liparis*
i. Leaves solitary on the stem, ovate-elliptical (Fig. 42, d). 10 *Malaxis*

1. **CYPRIPEDIUM** L. LADYSLIPPER

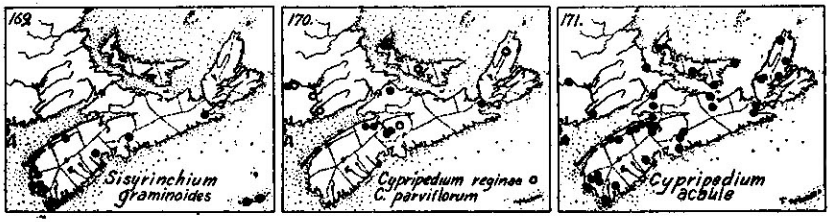
a. Plants leafy-stemmed; flowers 1-2, rarely several; lip with a roundish opening at the top.
b. Lip yellow, shorter than the sepals; sepals and petals linear-lanceolate, brownish and acute.
c. Lip 2-3 cm long; sepals purplish-brown. 1. *C. Calceolus* var. *parviflorum*
c. Lip 3.5-5 cm long; sepals paler and shorter. *C. Calceolus* var. *pubescens*
b. Lip white, flushed with purple; sepals and petals greenish-white, broad and obtuse. 2. *C. reginae*
a. Plant with two basal leaves only; flowers solitary; lip white or pink, split along the top. 3. *C. acaule*

1. C. Calceolus L., var. **parviflorum** (Salisb.) Fern., Rhodora 48:4. 1946. YELLOW LADYSLIPPER. Map 170.

Rare; rich or calcareous soil, often near outcrops of gypsum or limestone sparingly east to C.B. and west to Kings Co. (*C. parviflorum* Salisb.). Nfld. to B.C. south to N. M. and Ga.

Var. **pubescens** (Willd.)Correll is a larger extreme scarcely separable from the species. Most of the specimens examined seem to belong to the smaller plant, but a collection from Gore in Hants Co. is placed here.

N.S.; Me. to Ga. and Mo.



2. **C. reginae** Walt. SHOWY LADYSLIPPER. Map 170.

Rare; reported by MacKay as often abundant in tamarack swamps, Pictou; local in northern C.B., P.E.I. and in N.B. (*C. hirsutum* Mill., *C. spectabile* Swartz.).

Nfld. to Minn. south to Ga. and Mo.

3. **C. acaule** Ait. COMMON LADYSLIPPER. Map 171 Fig. 40, a.

Scattered throughout; often abundant in acid soil in dry or moist woods. It is characteristic of the pine woods of the Annapolis Valley, where scattered individuals are usually present. The white-flowered form has been named forma *albiflorum* Rand & Redfield. This is often common. Early June.

Nfld. to Minn. northwestward; south in the mts. to N.C. and Tenn.

2. HABENARIA Willd. FRINGED ORCHID

a. Lip not fringed.
  b. Leaves scattered on the stem.
    c. Leaves several to numerous, at least more than 2.
      d. Lip oblong, truncate, the apex with 2 or 3 terminal teeth or smooth; lower bracts of the inflorescence much longer than the flowers.
        e. Lip 3-toothed at the apex; spur 1-3 mm long, shorter than the lip. 1. *H. viridis*

e. Lip truncate; spur slender, 4-6 mm long, longer than the lip.
f. Leaves narrow, attenuate, towards the base of the plant; raceme rather open with the bracts little longer than the flowers. 2. *H. flava*
f. Leaves broader, more elliptic, scarcely attenuate; raceme compact with longer bracts. *H. flava* var. *virescens*
d. Lip lanceolate to linear, the apex entire, subacute or rounded; bracts little, if at all, longer than the flowers.
g. Flowers greenish, scarcely fragrant; lip not dilated at the base. 3. *H. hyperborea*
g. Flowers white, fragrant; lip dilated at the base. 4. H. *dilatata*
c. Stem-leaves 1 or 2; lip truncate, 2-3-toothed at the apex; bract shorter than the 3-16 flowers; raceme short and cylindrical. 5. *H. clavellata*
b. Leaves basal, oblong to orbicular, spread flat on the ground or rising from the base of the plant.
h. Leaf solitary, obovate or oblong; spur about 6 mm long, equal in length to the lip. 6. *H. obtusata*
h. Leaves 2, oval or orbicular; spur nearly twice as long as the lip.
i. Lip lanceolate, 1 cm long; spur 18-20 mm long; scape bractless. 7. *H. Hookeri*
i. Lip linear, 1.5-2 cm long; spur 18-40 mm long; scape bracted; leaves large.
j. Spur 1.8-2.5 cm long; leaves orbicular, 6-19 cm broad. 8. *H. orbiculata*
j. Spur 2.5-4 cm long; leaves larger and more elliptical, the whole plant generally larger. 9. *H. macrophylla*
a. Lip fringed.
k. Body of the lip oblong and fringed along the sides and apex; flowers white. 10. *H. blephariglottis*
k. Body of the lip 3-parted.
l. Flowers greenish or whitish, rarely with a tinge of purple; divisions of the lip cut into capillary segments or finely fringed. 11. *H. lacera*
l. Flowers purple or lilac; divisions of the lip fan-shaped, fringed at the truncate ends.
m. Lip 1-1.2 cm wide; flowers deep purple; lip cut less than one-third their depth. 12. *H. psycodes*
m. Lip 1.8-2 cm wide, more deeply fringed; flowers lilac. 13. *H. fimbriata*

1. **H. viridis** (L.)R.Br., var. **bracteata** (Muhl.) Gray

Rare; found in boggy spots on Sable Is.; characteristic of the richest woods on the mainland and in C.B. See Rhodora **28**: 169-174. 1926. Aug.

Nfld. to B.C. south to N.C. and Iowa; eastern Asia.

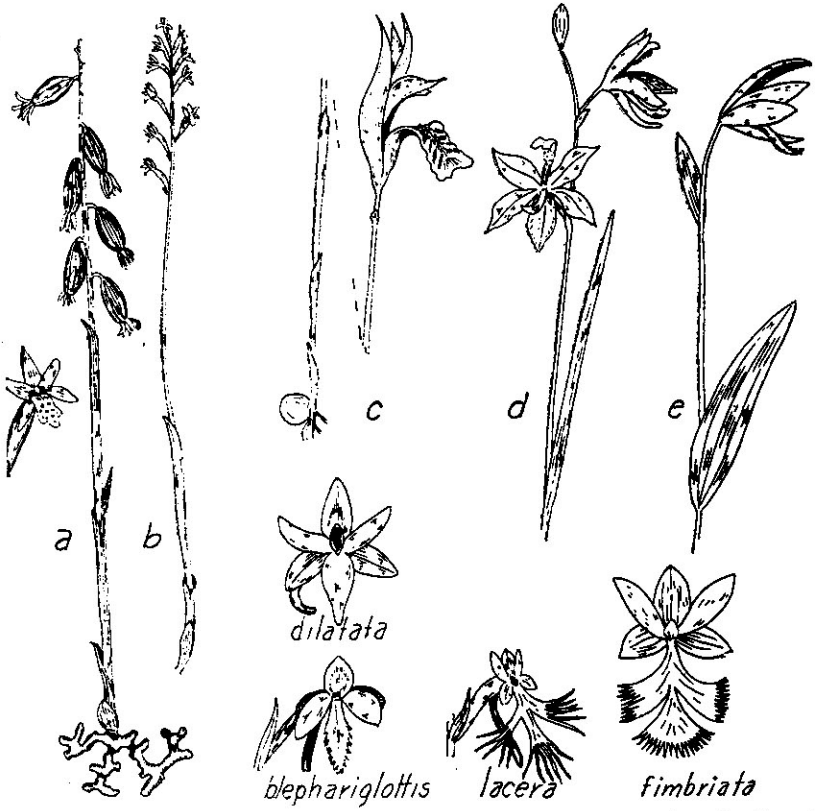


Fig. 41.—**Corallorrhiza.** a, **C. maculata,** x 1/3. b, **C. trifida,** x ½. **Arethusa.** c, plant, x ½. **Calapogon.** d, plant, x ½ **Pogonia.** e, plant, x ½. **Habenaria.** flowers, x 2.

2. **H. flava** (L.)Gray

Restricted so far as known to the river systems of the Tusket in Yarmouth and the Medway in Queens; pebbly, sandy or gravelly beaches or wet peaty margins of lakes and rivers in the Tusket Valley (Fernald, 1921); scattered on the pebbly strand of the Medway (Weatherby). Tex and Fla. northward to N.J. and N.S.

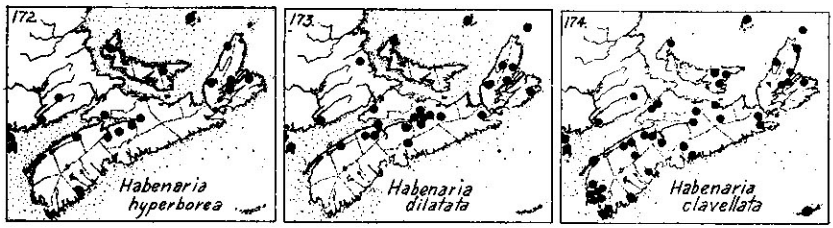
Var. **virescens** (Muhl.) Fern., Rhodora **23**: 148. 1921, is the common inland plant; rare, known only from Boylston, Guysborough Co.

3. **H. hyperborea** (L.)R. Br. GREEN HABENARIA. Map 172.

Intervales, wet meadows, bogs and well-drained swamps from Annapolis and Queens Cos. to C.B.; not seen by the

Gray Herbarium Expedition in the southwestern counties; never as common as the next species. Late June-Aug.

Greenland to Alaska south to N.Y., Ill. and Ore.



4. **H. dilatata** (Pursh) Gray. WHITE BOG-ORCHID. Map 173. Fig. 41.

Common and often abundant from Annapolis to northern C. B.; growing in situations similar to the preceeding species. July-Aug.

Lab. to Alaska south to N.J., Mich. and Wash.

5. **H. clavellata** (Michx.)Spreng., var. **ophioglossoides** Fern., see Rhodora 48: 161. 1946. Map 174. Fig. 40, b.

Common in bogs, poorly or well-drained swamps, and damp soil throughout. Late July.

Nfld. to Minn. south to Fla.

6. **H. obtusata** (Pursh) Richards.

Common in coniferous climax forest, mossy spruce or fir woods; scattered to common in eastern N.S., becoming rarer to Yarmouth Co. July-Aug.

Nfld. to Alaska south to N.Y., Minn. and Colo.

7. **H. Hookeri** Torr. Map 175. Fig. 40, c.

Scattered in most parts of the province, very rare or absent in the southwestern counties; deciduous woods or more frequently under conifers. June-July.

N.S. to Minn. south to Penn. and Iowa.

8. **H. orbiculata** (Pursh) Torr. Map 176.

Usually found under conifers; scattered in the northern parts of the province, characteristic of the coniferous climax forest in C.B. Aug.

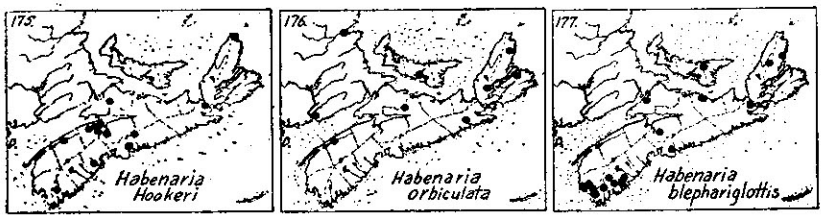
Lab. to Alaska south to Penn. and the mts. of N.C.

9. **H. macrophylla** Goldie

Rich deciduous or mixed woods; scattered across the northern part of the province and not nearly as common

as the preceeding species and perhaps merely a long-spurred extreme of it. Aug.

Nfld. to Ont. south to Conn. and Mich.



10. **H. blephariglottis** (Willd.) Torr. WHITE FRINGED-ORCHID. Map 177. Fig. 41.

Boggy or even dryish barrens, spruce thickets, in peaty hollows or occasionally even on railway embankments; common to abundant in the southwestern counties; characteristic of mature bogs in C.B.; rare through the rest of the province. Fernald states that it occurs over the gold-bearing rocks but not on granitic areas. July-Aug.

Nfld. to Minn. south to N.C.

11. **H. lacera** (Michx.)R. Br. RAGGED FRINGED-ORCHID. Map 178. Fig. 41.

Common throughout; meadows, damp fields, bogs and poorly-drained clay soils; occasional in the damp dune hollows and turfy banks on Sable Is. Some of the plants from C.B. often show a crimson tinge to the flowers and thus are intermediate to var. **terrae-novae,** Fern., Rhodora **28**: 21. 1926. of Nfld. This variety is also said to be the only one on Sable Island (Fernald, in Rhodora **48**: 185. 1946). July-Aug.

Nfld. to Man. south to N.C.

12. **H. psycodes**(L.)Spreng. PURPLE FRINGED-ORCHID. Map 179. Fig. 40, d.

Common in damp meadows throughout, often growing in dense masses. Late July-Aug. Intermediate forms between this and the following species occur.

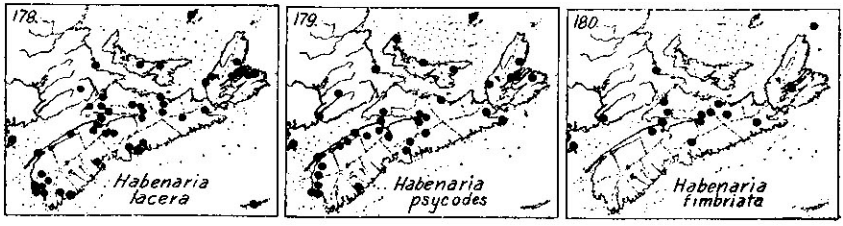
Nfld. to Minn. south to N.C.

13. **H. fimbriata** (Ait.)R. Br. FRINGED-ORCHID. Map 180. Fig. 41.

Often found growing together with the preceeding, but restricted to rich intervale soils, mostly in the north-cen-

tral part of the province; wet meadows, borders of swamps and along streams. July-Aug.

Nfld. and Que. south to N.Y. and the mts. of N.C.



3. **POGONIA** Juss.

1. **P. ophioglossoides** (L.)Ker. ROSE POGONIA. Map 181. Fig. 41, e.

Peat bogs, often growing in profusion in the spruce or mature bogs along the Atlantic Coast and in northern C.B., scattered elsewhere. Var. **brachypogon** Fern., Rhodora **23**: 245. 1921, has the fringe of the lip obsolescent, the segments of the perianth scarcely divergent, and grows more or less in clumps. This is found around the lakes of southern Yarmouth and Digby Cos., in many cases transitional to the typical form; as are also some of the plants of Nfld. and the Magdalens. July.

Nfld. to Minn. south to Fla.

4. **CALOPOGON** R. Br.

a. Leaves linear, grass-like.
b. Flowers magenta-crimson. 1. *C. puchellus*
b. Flowers nearly white. *C. puchellus* forma *albiflorus*
a. Leaves oblong- or elliptical-lanceolate, 7-11 cm long, 1.3-2.8 cm wide. *C. puchellus* forma *laterifolius*

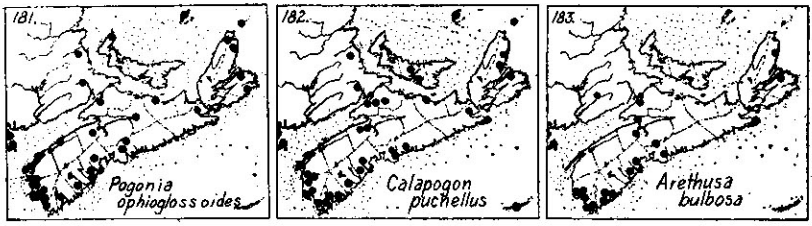
1. **C. puchellus** (Sw.)R.Br. Map 182. Fig. 41, d.

Mature bogs and swamps; one of the most characteristic plants of bogs in the eastern part of the province, even those at the edge of the sea; frequent in dune hollows on Sable Is.; scattered elsewhere and in cranberry bogs in the Annapolis Valley. July.

Forma **albiflorus** (Britt.)Fern. is rare; a single plant is reported from sandy and peaty margin of Lake Annis, Yarmouth Co. (Fernald, 1921). Forma **latifolius** St. John,

Proc. Boston Soc. Nat. Hist. 36: 69. 1921. Wet dune hollows, Sable Is.

Nfld. to Minn. south to Fla.



5. **ARETHUSA** (Gronov.)L.

1. **A. bulbosa** L. ARETHUSA. Map 183. Fig. 41, c.

Much rarer than the two preceeding species; bogs, generally in the most acid peat, around the coast of the province; rarely inland. July.

Nfld. to Minn. south to Penn. and the mts. of S.C.

6. **SPIRANTHES** Richard LADIES-TRESSES

a. Stem slender, leafless; leaves basal and ovate, soon disappearing; flowers 5 mm long; raceme slender and often one-sided, the flowers in one row. 1. *S. lacera*

a. Stem stout, leafy, at least towards the base; leaves linear to lanceolate; flowers 5-12 mm long; raceme thicker, not one-sided, the flowers in several rows.

b. Lip squarish, blunt, yellow, with small oblong growths on the margin at the base; leaves lanceolate, about 1 cm wide; flowering early July. 2. *S. plantaginea*

b. Lip ovate-oblong, scarcely squarish and less blunt; growths at the base round or nipple-shaped, sometimes lacking; leaves linear or linear-lanceolate.

c. Lip not constricted below; growths at the base prominent; lateral sepals not upturned and the flower-parts therefore not plainly tubular; beak of the stigma very long and slender; flowering late summer.

d. Flowers white; floral bracts exceeding the ovary by about half the length of the perianth; odor fragrant. 3. *S. cernua*

d. Flowers yellowish; floral bracts elongated; odor disgusting; flowering later. *S. cernua* var. *ochroleuca*

c. Lip constricted below the apex; growths minute or lacking; lateral sepals upturned and joined with the petals and upper sepal, so that the perianth parts are tube-like; beak of the stigma short; flowering late August. 4. *S. Romanzoffiana*

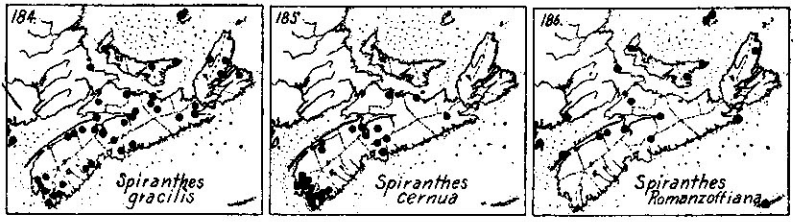
1. **S. lacera** Raf., see Fernald, Rhodora **48**: 5-8. 1946. LADIES'-TRESSES. Map 184. Fig. 42, a.

Scattered throughout, more common in sandy or gravelly soil, barrens, railroad cutting, edges of woods, and open coniferous or mixed woods or bush. (*S. gracilis* (Bigel.) Beck).

N.S. to Man. south to N.C., Tenn. and Okla.

2. **S. plantaginea** (Raf.)Torr. WILDLEAF LADIES'-TRESSES

Rare; mentioned by Lindsay from Windsor and Halifax.



Robinson found it between Margaree and Cheticamp; and it was found scattered on the grassy hillsides along Cape George, Antigonish Co., in flower July 11, 1941. (*S. latifolia, S. lucida* (H.H.Eaton)Ames).

N.S. to Wisc. south to Va.

3. **S. cernua** (L.) Richard. NODDING LADIES'-TRESSES Map 185. Fig. 42, b.

Boggy meadows, low hayfields, and seepy slopes and pastures, sandy shores of lakes throughout; generally scattered, but often abundant on seepy slopes of the Annapolis Valley. Late Aug.

Var. **ochroleuca** (Rydb.) Ames is often difficult to separate from the species; characteristic of the dryest of siliceous barrens in southwestern N.S. (Fernald, 1921). It is found in much the same general range as the species.

N.S. to Minn. and Nebr. south to Fla. and Tex.

4. **S. Romanzoffiana** Cham. Map 186.

Rare; scattered in swamps and boggy places from Annapolis Co. & Digby Neck north and east to C.B.; rare in damp boggy spots on Sable Island. Late July-Aug.

Nfld. to B.C. south to Conn., N.Y. and Calif.

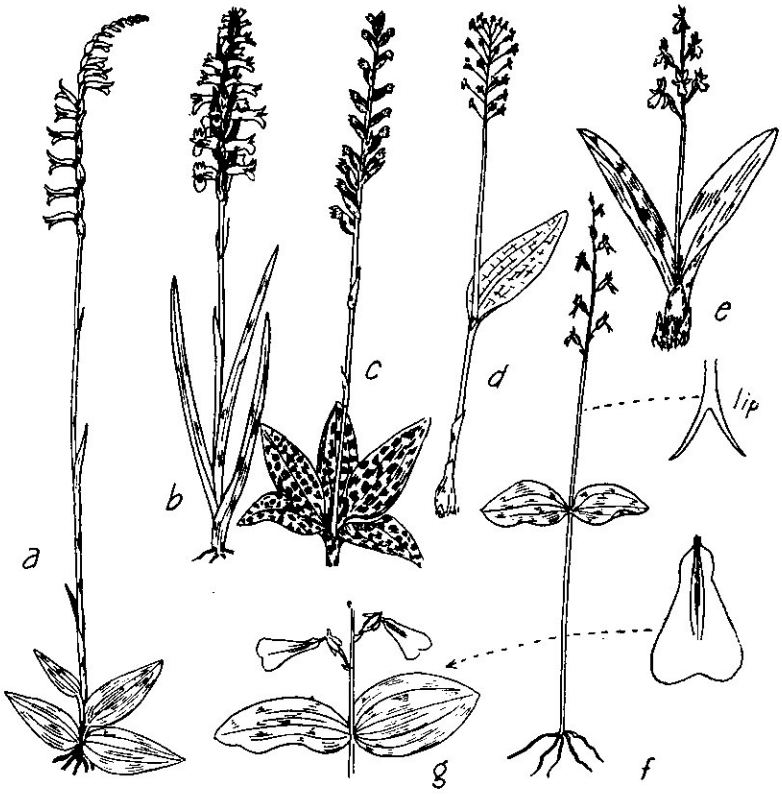


Fig. 42.—**Spiranthes.** a, **S. lacera,** x ½. b. **S. cernua,** x ½. **Goodyera.** c, **G. tesselata,** x ½. **Malaxis.** d, plant, x ½. **Liparis.** e, plant, x 1/3. **Listera.** f, **L. cordata,** x ½. g, **L. convallarioides,** part of plant, x ½.

7. **GOODYERA** R.Br.

a. Inflorescence loose; lip sac-like with an elongated tip and flaring or recurved margins; plants rarely over 25 cm high; leaves plainly reticulate-veined with white.

b. Flowers in a 1-sided raceme 3-7 cm long; perianth 4-4.5 mm long; leaves small, 1-3 cm long, widest near the base and often with the sides straight to an acute tip. 1. *G. repens*

b. Flowers in a loose spiral raceme 6-8 cm long; leaves usually rounded-tapering from the middle to each end. 2. *G. tesselata*

a. Inflorescence dense; lip scarcely saccate, elongate with the margins inrolled; plant large, usually 20-40 cm high; leaves green, often with the midrib lined with white, 5-10 cm long. 3. G. *oblongifolia*

1. G. repens (L.)R.Br. var. **ophioides** Fern. CREEPING RATTLESNAKE-PLANTAIN.

Mostly rare; it is reported as rather frequent in the dry

woods of eastern Halifax and Guysborough Cos. (Rousseau); and is occasional elsewhere in mossy or dryish coniferous woods. Aug. (*Epipactis*).

This var. of the European species ranges from Nfld. to Man. south to N.Y. and Mich. and the mts. of N.C.

2. **G. tesselata** Lodd. RATTLESNAKE-PLANTAIN. Fig. 42, c.

Local or scattered; Greenville, Yarmouth Co. (Fernald, 1921); coniferous or pine woods of the Annapolis Valley; characteristic of the coniferous climax forest of northern C.B. Aug.

Nfld. to Minn. south to Conn. and N.Y.

3. **G. oblongifolia** Raf., see Fernald, Rhodora **48**: 11. 1946. WESTERN RATTLESNAKE-PLANTAIN.

Known only from northern C.B. where it is characteristic of the deciduous climax or rich mixed forests, on slopes and in ravines. [*Epipactis decipiens* (Hook.)Ames].

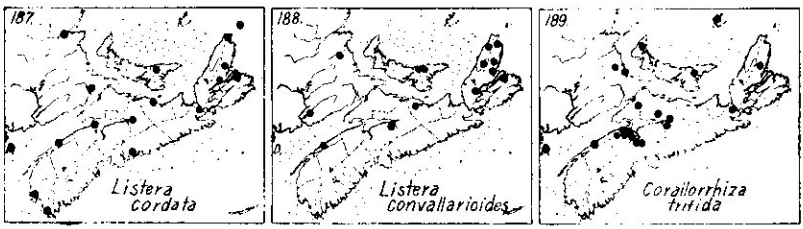
B.C. to Calif.; local across the continent to northern Me., N.B. and C.B.

8. **LISTERA** R. Br.

a. Flowers small, the lip 3-5 mm long, deeply cleft into two spreading prongs; pedicel shorter than the ovary; leaves 12-25 mm long. 1. *L. cordata*

a. Flowers larger, the lip about 9 mm long, shallowly lobed into rounded lobes; pedicel slightly longer than the ovary; leaves 30-50 mm long. 2. *L. convallarioides*

1. **L. cordata** (L.)R.Br. NORTHERN LISTERA. Map 187. Fig. 42, f.



Occasional in damp woods, in coniferous forests or in wet ravines throughout, becoming commoner to northern C.B.; inconspicuous and often overlooked. July-Sept.

Lab. to N.J. west to Mich.; Calif. northward to Alaska.

2. **L. convallarioides** (Sw.)Torr. LISTERA. Map 188. Fig. 42, g.

Rare from Annapolis to C.B.; common in northern C.B.; rich hardwood slopes, intervales and deciduous climax forest. It is abundant around Pleasant Bay, Inverness Co. July.

Nfld. to Alaska south to N.Y., Minn. and Calif.

9. CORALLORHIZA (Haller)R. Br. CORALROOT

a. Plant yellowish; lip white or very rarely with a few spots.
  b. Plants slender, 4-15 cm high; lateral lobes of lip small; spur very small and obscure. 1. *C. trifida*
  b. Plants large, stout, 2-4 dm high; lateral lobes of lip prominent; spur usually conspicuous. 2. *C. maculata* forma *flavida*
a. Plant madder-purple; lip spotted with purple, otherwise similar to forma *flavida*. 2. *C. maculata*

1. **C. trifida** Chatelain, var. **verna** (Nutt.) Fernald, in Rhodora **48**: 193-197. 1946. EARLY CORALROOT. Map 189. Fig. 41, b.

Scattered in the northern part of the province from Annapolis to C.B.; mostly in coniferous woods, often in dense young growth with little light. June-July. (*C. innata* R.Br. of earlier records).

Nfld. to Alaska south to Penn., N.C. and Minn.; Eurasia.

2. **C. maculata** Raf. SPOTTED CORALROOT. Map 190. Fig. 41, a.

Common from Annapolis to northern C.B.; not seen by the Gray Herbarium Expedition west of Annapolis; scattered elsewhere; rather rich soil in deciduous woods, although it is occasionally found under conifers; mentioned by Nichols as characteristic of the climax forest in northern C.B. (*C. multiflora* Nutt.). Late July onward.

Forma **flavida** (Peck)Farw., Amer. Midl. Nat. **10**: 208. 1927, is one of a number of color forms. This striking yellow one was found during the summer of 1942 to be common on the wooded slopes of the Annapolis Valley, usually growing in mixed woods. This form grew in dense colonies with the roots of many plants tangled together; while the species in the same woods grew as solitary plants or in groups of several plants. Apparently of wide distribution.

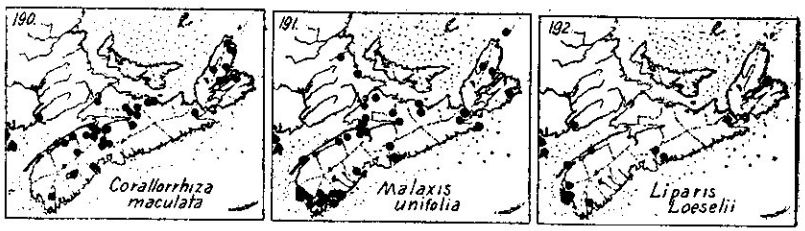
Nfld. west to B.C. south to Penn., N.C. and Calif.

10. **MALAXIS** Soland.

1 **M. unifolia** Michx. ADDER'S MOUTH. Map 191. Fig. 42, d.

Scattered throughout; wet meadows, damp upland pastures and fields, bogs near the coast, poorly drained clay soils, and occasionally in cranberry bogs. July-Aug. [*Microstylis unifolia* (Michx.)BSP.].

Nfld. to Man. south to Fla. and Mo.



11. **LIPARIS** Richard.

1. **L. Loeselii** (L.)Richard TWAYBLADE. Map 192. Fig. 42, e.

Occasional in peaty meadows and cobbly lake shores in Yarmouth and Digby Cos. (Fernald, 1921); scattered eastward near the coast and rather frequent in the bogs from Halifax to C.B. (Rousseau); rare or absent in the more northern region. July-Aug.

N.S. to Sask. south to N.C. and Mo.

29. **SALICACEAE** WILLOW FAMILY

a. Buds with a single scale; scales of the catkins entire or merely toothed; stamens few; flowers with small glands at their base; willows. 1. *Salix*

a. Buds with several scales; scales of the catkins laciniate; stamens numerous; flowers without glands; poplars. 2. *Populus*

1. **SALIX** (Tourn.) L. WILLOW

Willows, in general, comprise one of the most difficult groups to name correctly. Their variability, tendency to hybridize, and their similarity of appearance make considerable field work essential. In most cases pistillate and stam-

inate catkins can be found on neighboring bushes so that two opportunities are given for keying out the species.

In early spring *S. discolor* and *S. humilis* are the commonest kinds. Later, *S. Bebbiana* will comprise the majority of the flowering plants. In central Nova Scotia *S. pyrifolia* will shortly follow, growing mostly in clay or in wet ground. *S. cordata* is common along streams and rivers. *S. lucida* comes still later and grows largely on sand bars. By far the commonest tree willow is the introduced *S. alba:* although *S. purpurea* is common around some of the towns and is distinguished by its dark bluish-green leaves. It is impossible to key out all the forms and variations, but the following will help to determine the main ones at least.

a. Depressed creeping shrubs with small rounded leaves; rare in northern Cape Breton.

Stamen 1; ovary and capsule glabrous or nearly so; young branches and leaves sparingly pubescent to glabrous. 8. *S. Uva-ursi*

Stamens 2; ovary and capsules densely pubescent; young branches and leaves silky villous. 9. *S. cordifolia*

a. Upright shrubs or trees.

b. Stamens 5-12; ovary glabrous with 2 glands; leaves glabrous, bright green beneath, widely lanceolate, glandular-serrate.

Cultivated, or a roadside escape; stalk of the staminate catkin 2 cm long, the bracts more than 1 cm wide; pedicels of the ovaries twice as long as the glands; leaves short acuminate, paler beneath; branches brownish-green. 1. *S. pentandra*

Native on river-shores; stalks of staminate catkin 1 cm long, the bracts less than 1 cm wide; pedicels of the ovaries 3-4 times as long as the glands; leaves very long-pointed; branches yellowish-brown. 2. *S. lucida*

b. Stamens 1-2 (rarely 3-5 in *S. alba*); ovary pubescent or glabrous; leaves various.

c. Catkins present.

d. Catkins staminate.

e. Filaments fused up to the anthers; anthers red; catkins before the leaves, with black scales. 17. *S. purpurea*

e. Filaments not fused; stamens 2, separate.

f. Staminate flower (each 2 stamens) with 2 glands; becoming trees.

Branches not brittle at the base; leaves usually silky beneath when young. 3. *S. alba*

Branches brittle at the base so that they snap off easily; leaves glabrous or very slightly silky beneath when young. 4. *S. fragilis*

f. Staminate flower with 1 gland at the base; shrubs or rarely small trees.

g. Scales of the catkins pale, with pale or but slightly darker tips.

Branches glabrous as are also the new leaves; filaments glabrous.

Shrub 1m or less high; leaves not toothed; anthers reddish when young. 7. *S. pedicellaris*

Shrub, larger and spreading; leaves well developed at flowering time, closely and finely glandular-serrate. 6. *S. pyrifolia*

Branches and leaves dull pubescent; filaments villous at the base; shrubs to small tree. 13. *S. Bebbiana*

g. Scales of the catkins dark.

h. Catkins appearing well before the leaves, sessile or nearly so, with merely a few small bracts at the base, short oval to elliptic.

Twigs glabrous, with a bloom; leaves later linear to lanceolate. 16. *S. pellita*

Twigs without a bloom.

Anthers red when young; twigs dirty pubescent; catkins short, to 3 cm long. 11. *S. humilis*

Anthers yellow; twigs glabrous (pubescent in hybrids between this species and *S. humilis*); leaves later nearly oblong. 10 *S. discolor*

h. Catkins appearing slightly before or with the leaves, with a short bracted or leafy stalk.

Young bracts or leaves glabrous or with dull matted hairs. 5. *S. cordata*

Young bracts and leaves with lustrous fine appressed pubescence.

Branches stout, yellowish; filaments glabrous; cultivated, becoming a tree. 14. *S. viminalis*

Branches slender, reddish-brown; filaments pilose at the base; shrub, rather rare. 12. *S. sericea*

d. Catkins pistillate.

i. Ovary glabrous.

j. Ovary sessile; flower with 1 gland; scales yellow; becoming a tree. (See *S. purpurea* with black scales). 3. *S. alba*

j. Ovary plainly stalked.

k. Scales of the catkin yellowish to yellow-brown, light or but slightly darkened at the apex.

Bush or tree, usually over 1 m high; leaves toothed; stigma sessile or nearly so.

Leaves lanceolate, tapering to the base; twigs brittle at the base; flower with 2 glands, introduced tree with upright branches. 4. *S. fragilis*

Leaves short-oval to widely lanceolate, cordate at the base, closely glandular-toothed when young; shrub with spreading branches. 6. *S. pyrifolia*

Bush, rare and growing in meadows or bogs, less than 1 m high; leaves not toothed. 7. *S. pedicellaris*

k. Scales of the catkin blackish. 5. *S. cordata*

i. Ovary pubescent.

1. Style very short (nearly as long as the stigma in *S. discolor*).

m. Scales yellowish or slightly darker toward the tip; catkin with bracts or leaves at the base; style lacking or very short. 13. *S. Bebbiana*

m. Scales black; catkins sessile or nearly so, appearing with or before the leaves.

n. Ovary sessile; style absent; catkins up to 2 cm long; twigs glabrous. 17. *S. purpurea*

n. Ovary stalked; style longer or distinct.

Style nearly as long as the stigmas; catkins mostly over 2.5 cm long; capsules 7-13 mm long; twigs glabrous as are also the undersides of the leaves in typical forms. 10. *S. discolor*

Style very short; catkins about 2.5 cm long; twigs pubescent; undersides of leaves pubescent.

Capsule tapering to a slender beak 10-15 mm long; leaves with woolly hairs beneath. 11. *S. humilis*

Capsule blunt, about 3.5 mm long; leaves with fine appressed pubescence beneath. 12. *S. sericea*

l. Style longer than the stigmas; catkins with or shortly after the leaves in spring.

o. Twigs finely pubescent, later becoming glabrate, without a bloom; pedicel of the ovary shorter than the gland.

Pedicel about half as long as the glands; style long; introduced tree with narrow leaves. 14. *S. viminalis*

Pedicel finally becoming as long as the gland; tall introduced shrubs, rare. 15. *S. Smithiana*

o. Twigs glabrous with a fine bloom; pedicel of the ovary longer than the gland. 16. *S. pellita*

c. Catkins absent; leaves mature.

p. Leaves entire or nearly so with scattered teeth near the tip, glabrous.

Leaves sub-opposite on the young twigs, bluish-green, very smooth, narrowly lanceolate; becoming trees. 17. *S. purpurea*

Leaves all alternate, not bluish-green, oblong-lanceolate to oblong; shrubs to 1 m high. 7. *S. pedicellaris*

p. Leaves mostly distinctly toothed, or if entire then with some pubescence.

q. Leaves lanceolate, more than 3 times as long as wide, closely and regularly toothed.

r. Leaves slightly pubescent to glabrous beneath, the edges not inrolled.

Trees; leaves long tapering to the base.

Twigs brittle at the base so that they snap off easily; leaves glabrous beneath. 4. *S. fragilis*

Twigs not brittle at the base; leaves glabrous or usually slightly pubescent beneath, at least along the mid-rib. 3. *S. alba*

Shrubs in low or wet areas, widely branching; leaves cordate, rounded or short-tapering at the base. 5. *S. cordata*

r. Leaves densely pubescent beneath, oftener linear, sometimes inrolled.

Hairs on the lower surface silky and closely appressed; margin of leaf not strongly inrolled. 14. *S. viminalis*

Hairs on the lower surface tangled and erect; margin of leaf usually strongly inrolled.

Twigs glabrous, with a bloom. 16. *S. pellita*

Twigs grayish with dirty pubescence. 11. *S. humilis*

q. Leaves wider, averaging less than 3 times as long as wide, often irregularly and shallowly toothed, rarely nearly entire.

s. Leaves glabrous or nearly so beneath.

t. Leaves mostly cordate at the base, closely and regularly toothed.

Leaves sharply cut, prominently reticulated beneath, wholly glabrous. 6. *S. pyrifolia*

Leaves with teeth rather blunt and thick; with thin raised veins beneath but not prominently reticulated, often with a little pubescence. 5. *S. cordata*

t. Leaves tapering to the base, usually widest above the middle, coarsely and irregularly toothed, glabrous. 10. *S. discolor*

s. Leaves prominently pubescent beneath.

Pubescence silky and closely appressed. 12. *S. sericea*

Pubescence matted or woolly.

Twigs reddish with crisp whitish hairs when young; leaves widest above the middle, strongly rugulose. 13. *S. Bebbiana*

Twigs grayish with dirty pubescence; leaves lanceolate, often densely grayish pubescent beneath. 11. *S. humilis*

1. S. pentandra L. BAY WILLOW.

Occasionally planted and found along roadsides in parts of the province. Introduced from Eu. and sparingly escaped in eastern Canada and the U. S.

2. S. lucida Muhl. SHINING WILLOW. Map 193. Fig. 43.

Common along streams, sand bars, and along sandy

edges of lakes; commonest from Digby to northern C. B., and scattered elsewhere.

Nfld. to the N. W. Territories south to N. J. & Nebr.

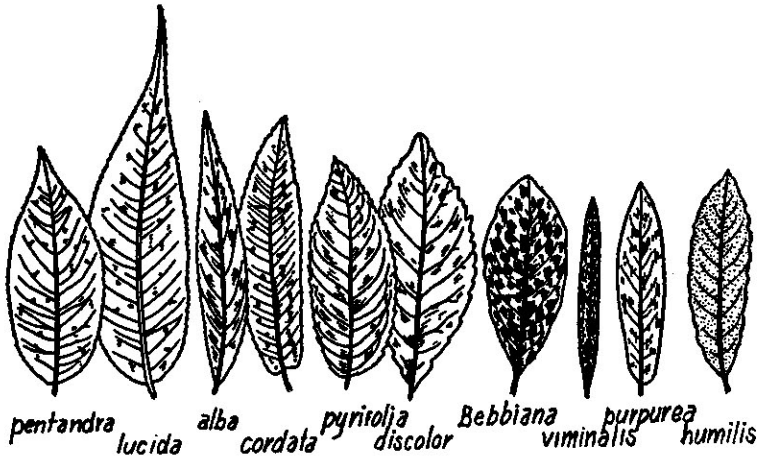


Fig. 43.—Salix, typical leaves, x ½.

3. S. alba L. WILLOW.

The "French Willow" is one of the willows which reaches the stature of a large tree. Varieties exist which differ slightly in pubescence of the leaves or color of the branches. The typical form has the branchlets olive-brown, the leaves finely silky beneath. The commonest variety is var. **vitellina** (L) Stokes with yellowish branches and leaves slightly silky beneath. Var. **calva** G. F. W. Mey has the branches dark brown with leaves practically glabrous beneath.

Early introduced from Eu. and widely distributed.

4. S. fragilis L. CRACK WILLOW.

This willow, which also forms a large tree, is occasionally planted in the province, but as yet is much rarer than the preceeding species. It is very similar to *S. alba* in appearance, but it has the branches very brittle at the base so that they snap off very readily when bent downwards.

Eu. and western Asia; long cultivated.

5. S. cordata Michx. HEART-LEAVED WILLOW. Fig. 43.

Fernald, Rhodora **48**: 31-38, 1946, separates the plants here included into two species; a relatively northern species *S. cordata*, ranging from Labrador to James Bay and south to New York; and *S. rigida* Muhl., with a range for the most

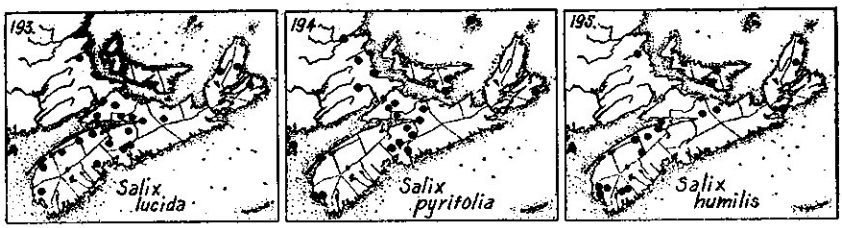
part more southern. An abbreviation of his differences is given here.

S. cordata: Leaves rather broad, mostly strongly cordate, averaging twice as long as wide; staminate catkins on leafy axillary branches with leaves well developed at flowering; pistillate catkins dense with appressed-ascending ovaries; capsules in fruit crowded on very short pedicels about the length of the bracts.

S. rigida: Leaves one eighth to one third as broad as long, rounded or tapering at the base; staminate catkins with short, barely expanded bracts at the base; pistillate catkins with widely spreading ovaries; capsules on pedicels usually much longer than the bracts.

In studying the willows common in the center of the province, they all key out to *S. rigida.* However, numerous collections of *S. cordata* and its variety are cited. Until this group is studied in more detail and over a wider range in the province, I am keeping them all under the above name; and leaving this problem to some-one interested in working out our trees and shrubs.

Lab. and Nfld. to B. C., south to Va. and Calif.



6. S. pyrifolia Anders. BOG WILLOW. Map 194. Fig. 43

Swampy thickets, poorly drained areas, bogs and heavy soils throughout; conspicuous in early spring with its shining twigs and shining glandular-toothed leaves. (*S. balsamifera* Barratt).

Nfld. to the Mackenzie south to N. Y., and Minn.

7. S. pedicellaris Pursh, var. **hypoglauca** Fern., Rhodora **11**: 161. 1909.

Common in a sphagnous swale north of Middlefield, Queens Co., found by Mr. C. A. Weatherby in the summer of 1941. It was also found in 1944 in a meadow at Upper

Musquodoboit where it again was growing luxuriantly over the area; Bass R., N. B.

Nfld. and Que. south to Conn.

8. S. Uva-ursi Pursh. BEARBERRY WILLOW.

Collected by Perry and Roscoe on a wind-swept barren, St. Paul Is., 1930.

Lab. to Alaska south to N. S. and the mts. of N. Eng. and N. Y.

9. S. cordifolia Pursh, var. **callicarpaea** (Trautv.) Fern., Rhodora **28**: 184-185. 1926.

Like the last this species is known only from a barren on St. Paul Is., northern C. B.

Nfld. & Lab. to the Shickshock Mts. in Que.

10. S. discolor Muhl. PUSSY WILLOW. Fig. 43.

Common throughout on low ground, roadsides and edges of swamps; variable and hybridizing to a considerable extent with *S. humilis*. Bushes have also been found with leaves finely pubescent beneath, which seems to be hybrids with *S. Bebbiana*.

Nfld. to Man. south to Va. and Mo.

11. S. humilis Marsh. Map 195. Fig. 43.

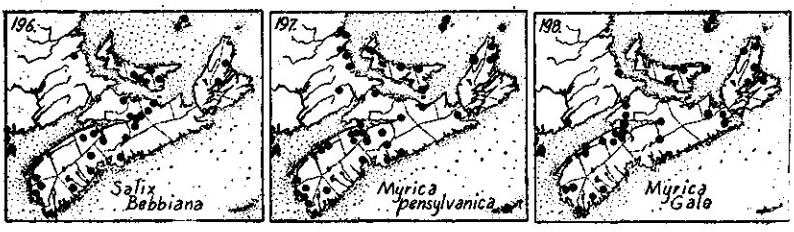
Widely distributed through the province in clayey soils, low ground or even on low fields and old abandoned areas. In south-western N. S. the plant has leaves with a very dense velvety or satiny lustrous pubescence on the under sides. This is var. **keweenawensis** Farw., Mich. Acad. Sci. Ann. Rept. **6**: 206. 1904. Eastward the leaves are whitish or grayish pubescent beneath, with dirty pubescent twigs. Freely hybridizing with *S. discolor*.

Nfld. to Minn. south to N. C.

12. S. sericea Marsh. SILKY WILLOW.

Rare in western N. S.; scattered east to Grand Lake in Halifax Co.

N. S.; Me. to Mich. south to Va.



13. S. Bebbiana Sarg. BEAKED WILLOW Map 196. Fig. 43.

The commonest species of willow in the province, found throughout in many habitats and very variable. Occasionally large shrubs or small trees may be found with the leaves and twigs nearly glabrous and the leaves smooth instead of rugose. This approaches var. *perrostrata* (Rydb.) Schneid. which is a western and northern variety. The opposite extreme with leaves densely tomentose or cinereous-tomentose beneath is var. **capreifolia** Fern., Rhodora **16**: 177. This was reported as small trees in woods and thickets at the margin of Lily Lake, Sandy Cove (Fernald, 1921). (*S. rostrata* Richards.).

Nfld. to Alaska south to Penn. and Calif.

14. S. viminalis L. COMMON OSIER. Fig. 43.

Scattered and an occasional escape from cultivation.

Eurasia; naturalized in N. A.

15. X. S. Smithian Willd.

This hybrid willow is occasionally planted and escapes in some parts of the province. It is naturalized on a clay bank by the sea, Baddeck (Fernald, 1921). It is a tall shrub to 6 m high with widely lanceolate leaves which are grayish soft-pubescent beneath.

16. S. pellita Anders.

Stated by Rousseau to be common in the region of Canso; seen occasionally elsewhere in the interior where it is rare and the distribution very poorly known; north of Five Islands and near Parrsboro.

Nfld. to Lake Winnipeg south to Me., Vt. and Mich.

17. S. purpurea L. PURPLE OSIER. Fig. 43.

Abundantly naturalized around Yarmouth, Wolfville and probably other towns of the province; rare in the country.

Eurasia and Africa; long cultivated.

2. POPULUS (Tourn.) L. POPLAR AND ASPEN

a. Leaves permanently whitish woolly beneath, often palmately lobed; petioles terete; buds tomentose. 1. *P. alba*

a. Leaves glabrous or becoming so, or lightly pubescent on the veins beneath.

b. Leaves without a translucent border.

c. Petioles flattened; buds not very large nor viscous.
d. Leaves ovate, coarsely toothed; winter buds white-pubescent (Fig. 44, g). 2. *P. grandidentata*
d. Leaves usually wider than long, finely toothed or crenate-serrate; winter buds glossy and shiny (Fig. 44, e). 3. *P. tremuloides*
c. Petioles terete, not flattened; leaves whitish beneath; buds very large and sticky-viscous (Fig. 44, f).
e. Branches glabrous; leaves rounded to rarely broad-truncate at the base, rather narrow. 4. *P. balsamifera*
e. Branches pubescent, leaves cordate, slightly pubescent on both sides, and densely so on the veins beneath. 5. *P. candicans*
b. Leaves with a clearly defined translucent border, glabrous; petioles flattened, buds glabrous, rather small.
f. Leaves wedge-shaped at the base; branches strongly ascending; pyramidal introduced tree. 6. *P. nigra*
f. Leaves truncate or broadly cuneate at the base; branches spreading. 7. *P canadensis*

1. P. alba L. WHITE POPLAR. SILVER MAPLE.

Commonly planted around buildings and along roadsides, almost impossible to eradicate when once established since it produces an abundance of root suckers. Most of the trees recently planted belong to var. **nivea** Ait. with the leaves silvery-tomentose beneath and the blades lobed like a maple leaf.

Eurasia; widely introduced.

2. P. grandidentata Michx. POPLAR. Fig. 44, g.

Common throughout; forming a small part of the original forest but now common on light soils or burnt-over sandy areas; especially abundant in the Annapolis Valley.

N. S. to Minn. south to N. C.

3. P. tremuloides Michx. TREMBLING ASPEN. Fig. 44, e.

Common throughout, mixed with or often growing on wetter ground than the preceeding species. Trees with one leaves prominently cordate at the base and usually thicker in texture are var. **intermedia** Vict., Contrib. Inst. Bot. Univ. Montreal **16**: 8. 1930. This is occasional in Colchester and Kings Co., and probably throughout eastern Canada.

Lab. to Alaska south to Penn. and Calif.

4. P. balsamifera L. BALSAM POPLAR. Fig. 44, f.

See Rouleau, Ernest. Rhodora **48**: 103-110. 1946 for the nomenclature.

Common along streams and open intervales, occasionally seen in the original forest in northern C. B., planted as a shade tree and often seen in clumps or as isolated trees around old houses, deserted cellars or on roadsides throughout; not noted growing native on the mainland. (*P. Tacamahaca Mill.*)

Lab. to Alaska south to N. Y., Mich. and Ore.

5. P. candicans Ait. BALM-OF-GILEAD.

Rare; in Pictou and Kings Co.; very similar in general appearances to the last species. Both of these species make very inferior shade trees and are now being replaced by newer forms of the hybrid populars.

Planted as a shade tree; origin unknown.

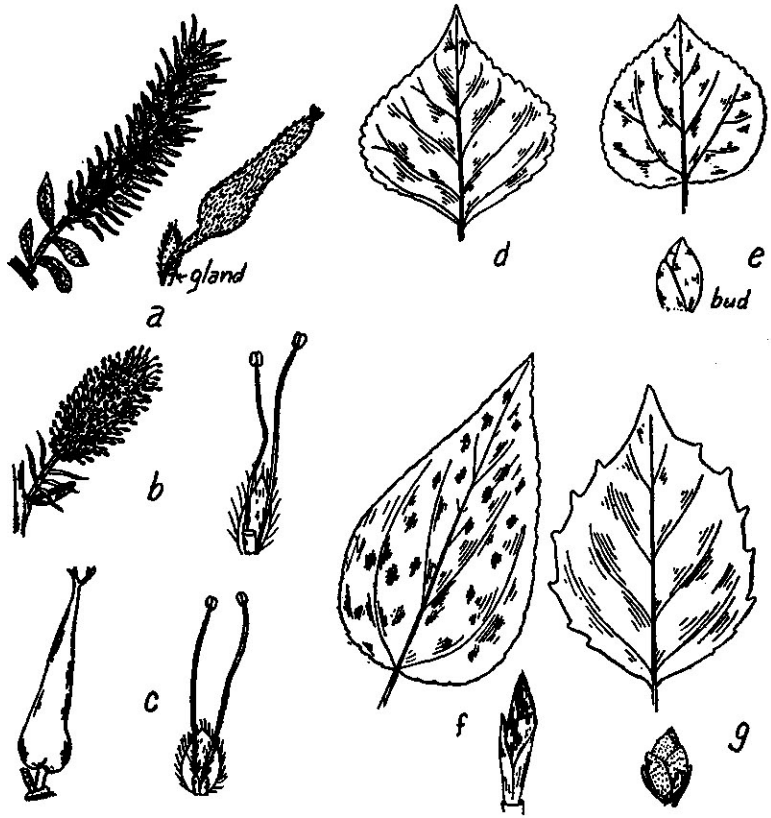


Fig. 44.—**Salix.** a, **S. Bebbiana,** pistillate catkin, x ½, flower, x 5. b, **S. Bebbiana,** staminate catkin, x ½; flower, x 5. c, **S. cordata** pistillate and staminate flowers, x 5. **Populus.** d, **P. canadensis,** leaf. e, **P. tremuloides.** f, **P. balsamifera.** g, **P. grandidentata.**

6. P. nigra L., var. **italica** Moench. LOMBARDY POPLAR.

Commonly planted in the Annapolis Valley; rare elsewhere; near the northern limit of its range in N. S.

Early introduced into N. A.

7. P. canadensis Moench. HYBRID POPLAR.

Various forms and varieties of these hybrid poplars are now being planted in the province along roadsides and especially about towns where they excel because of their fast growing habit and good foliage.

30. MYRICACEAE SWEET GALE FAMILY

a. Leaves deeply and pinnately lobed; bracts at base of the ovary 8; fruit surrounded by a bur. 1. *Comptonia*

a. Leaves merely toothed; bracts at base of the ovary 2–4; bur absent. 2. *Myrica*

1. COMPTONIA L'Her.

1. C. peregrina (L) Coulter. SWEET FERN. F'g. 45, a.

One of the commonest ground shrubs over much of the open sandy or barren soil of the province; abundant on the sands of Kings and Cumberland Cos., and throughout the granitic and quartzite areas in the center of the province, usually associated with pine and wire birch. (*Myrica asplenifolia* L., see Rhodora **40**: 410-411. 1938). May.

N. S. to Man. south to Va. and northern Ga.

2. MYRICA L.

a. Leaves glossy above; nutlets covered with a white wax, 2.5-3 mm in diam.; flowers on the current year's wood, appearing after the leaves (Fig. 45, c). 1. *M. pensylvanica*

a. Leaves dull on both sides; nutlets small, with 2 wing-like bracts; flowers at the ends of last year's branches, appearing before the leaves (Fig. 45, b). 2. *M. Gale*

1. M. pensylvanica Loisel. BAYBERRY. Fig. 45, c. Map 197.

Abundant in the southwestern counties; found around the coast on headlands, beaches and occasionally in bogs; scattered in the center of the province on the heavier soils (*M. cerifera* L. of earlier authors, see Rhodora **37**: 423. 1935). June.

Nfld. to western N. Y. and Md., chiefly near the coast.

Fig. 45.—**Comptonia.** a, fruiting branch, x ½. **Myrica.** b **M. Gale,** x ½. c, **M. pensylvanica,** x ½.

2. **M. Gale** L. SWEET GALE. Fig. 45, Map 198.

Common throughout; edges of streams, along still-waters, in ditches and well-drained swamps, or on heaths. Var. **subglabra** (Cheval.) Fern., Rhodora **16**: 167. 1914, with the leaves glabrous or nearly so beneath instead of pubescent, is known from P. E. I. and undoubtedly occurs also in N. S. It is found in the northeastern part of the range of the species.

Lab. to Va. westward; Eurasia.

31. BETULACEAE BIRCH FAMILY

a. Bark of older twigs with conspicuous elongated lenticels, rather easily peeling off; nutlets small, winged, exposed in the axils of the scales of the catkin or spike; stamens 2 or 4; alders and birches.

b. Bark whitish to yellowish; scales of the fertile catkins thin, 3-lobed; stamens 2; fruit with thin wings; birches (Fig. 46). 1. *Betula*

b. Bark brownish, not flaking off; fertile scales woody, forming an erect peristent cone; stamens 4; fruit with thick wings; alders (Fig. 47, a, b). 2. *Alnus*

a. Bark of older twigs and trunk without elongated lenticels and not peeling readily; nutlets or nut not winged, enclosed in a papery or leathery involucre; leaves softly pubescent beneath.

c. Shrub, wiry and stoloniferous; flowers and fruit in small clusters, the mature fruit to 1 cm thick and the involucre with a long beak; leaves with 5-8 pairs of veins; hazelnut (Fig. 47, d). 3. *Corylus*

c. Tree, small and not stoloniferous; flowers and fruit in hanging catkins, the nutlets enclosed in bladdery sacs like a bunch of hops; leaves with 9 or more pairs of veins (Fig. 47, c). 4. *Ostrya*

1. **BETULA** (Tourn.) L. BIRCH

Fernald, M.L. Notes on Betula in eastern North America. Rhodora **47**: 303-329. 1945. Plates 963-975.

a. Leaves with 9-11 pairs of veins; pistillate catkins oval, 2-3 cm long; staminate catkins stout, several; wing of the fruit narrower than the body (Fig. 46, c).

b. Scales of the fruiting catkin 5-8 mm long, the wedge-shaped basal part 1-2.5 mm long. 1. *B. lutea*

b. Scales of the fruiting catkin 8-13 mm long, the basal part 2.5-6 mm long. *B. lutea* var. *macrolepis*

a. Leaves with 7 or fewer prominent veins; pistillate catkins cylindrical.

c. Trees or large bushes; fruits with wings much wider than the body.

d. Bark chalky- or ashy-white, not flaking off in layers; leaves glabrous with long tail-like tips; staminate catkins usually solitary (Fig. 46, a). 2. *B. populifolia*

d. Bark warm brownish to creamy-white, flaking off easily in most types; leaves acute to acuminate but not long-pointed.

e. Leaves glabrous on both sides, except occasionally in the axils of the veins beneath; young twigs glabrous or with resinous warts.

f. Leaves small, the typical ones 3-7 cm long, the bases wedge-shaped to squarish and not toothed near the petiole; resembling *B. populifolia* in aspect; planted. 3. *B. pendula*

f. Leaves 5-10 cm long, the bases rounded and toothed nearly to the petiole; native tree. 4. *B. caerulea-grandis*

e. Leaves pubescent beneath, at least when young; young twigs pubescent or puberulent.

g. Buds very resinous; leaves rather small, acute, 3-5 cm long; fertile catkin to 3 cm long; introduced tree. 5. *B. alba*

g. Buds scarcely resinous; leaves mostly acuminate, 3-10 cm long (Fig. 46, b); fertile catkins to 6.5 cm long; common. 6. *B. papyrifera*

c. Low shrubs of bogs or heaths, often prostrate; fruits with wings narrower or barely wider than the body.

h. Leaves elliptic to rhombic or ovate, acute, about 4 cm long, sharply toothed; fruits with wings scarcely wider than the body. 7. *B. borealis*

h. Leaves sub-orbicular to widely elliptical, 1-3 cm long, coarsely and bluntly toothed; wing of fruit about half as broad as the body. 8. *B. pumila*

1. **B. lutea** Michx. Fig. 46, c. YELLOW BIRCH.

Throughout; wooded lake margins in the southwestern counties; common to dominant in the hardwood forests

eastward. Yellow birch is found in rather poorly-drained soil, on the slopes of the mountains on a lower level than the sugar maple. Common in swampy land in the center of the province.

Var. **macrolepis** Fern., Rhodora **24**: 170. 1922, has much the same range as the species. Scattered in the south-western part of the province, the range eastward and the distinction between this and the typical form unknown. Macoun's records of *B. lenta* apparently belong to this species; as also does *B. lutea* var. *alleghaniensis* (Britt.) Ashe of Britton and Brown.

Nfld. to Man. south to Ga. and Tenn.

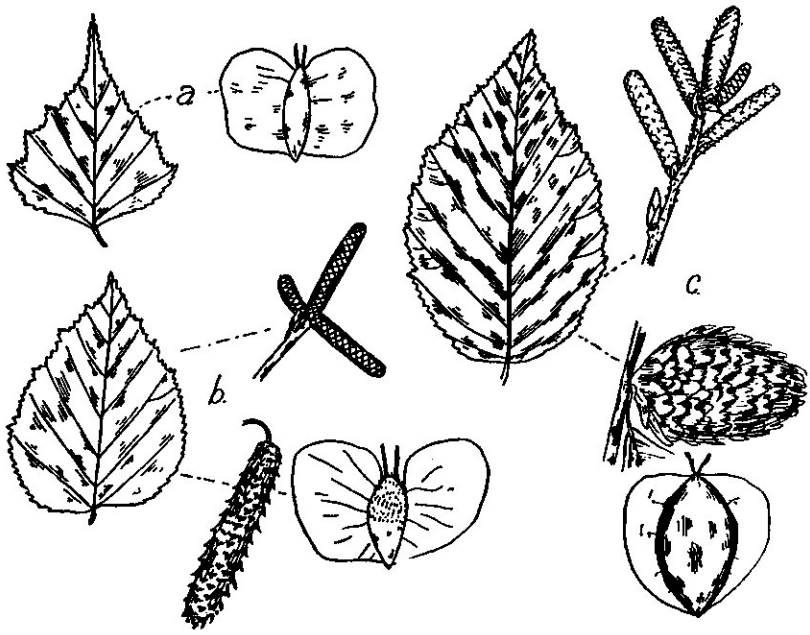


Fig. 46.—**Betula.** a, **B. populifolia,** leaf, x ½; fruit, x 3. b, **B. papyrifera,** leaf, x ½; fruiting catkin, x ½; staminate catkins in winter state, x ½; fruit, x 5. c, **B. lutea,** leaf, fruiting catkin, staminate catkins, and fruit.

2. **B. populifolia** Michx. Fig. 46, a. WIRE or GRAY BIRCH.

Very common throughout on sandy soils, in pastures,

barrens and burnt-over land. It is most prevalent in the western part of the province, and is replaced more or less to the eastward by *B. papyrifera*. It is a very characteristic shrub in the early stages of succession in pastures and barrens.

N. S. to Ont. south to Dela.

3. **B. pendula** Roth

Very commonly planted about towns and dwellings; rarely escaping to roadsides.

N. S. to Ont. south to Penn., Mich. and Iowa.

4. **B. caerulea-grandis** Blanchard

Wooded roadside at Armdale, Halifax; roadside thickets and banks of the Lahave R., Bridgewater; common at Charlottetown, P.E.I. (Fernald, 1922). This tree is said to be an abundant and characteristic tree in parts of P.E.I. (Fernald, l.c.); but in N.S. it has been found only about towns. The different appearance and bluish-green color of the birches of P.E.I. may be due to this element. The fruiting catkins are usually in 2's or 3's and the fruits are nearly glabrous. Hybrids with *B. populifolia* are named *B. caerulea* Blanchard. This has the white bark, but the staminate catkins are usually solitary and the leaves are smaller and more acuminate. Armdale and Dartmouth.

Gaspe south to N.S., northern N. Eng. and northern N. Y.

5. **B. alba** L.

An introduced tree which has become naturalized along roadsides and in thickets. Planted trees along roadsides and dwellings should be checked as for this species.

Introduced from Eu.; Nfld. to Mich. south to Penn.

6. **B. papyrifera** Marsh. Fig. 46, b. Map 199. WHITE, PAPER OR CANOE BIRCH.

The white birch is one of the most variable trees of eastern Canada. The following varieties are more or less well-marked.

a. Leaves rounded or tapering to the base.
b. Mature fertile bracts 3.5-7 mm long; fruits 3.5-5 mm wide.
c. Branchlets spreading or ascending; leaves broadly ovate, mostly rounded to the base; pistillate catkins mostly solitary.
d. Bark of mature trunks creamy to pinkish-white, readily flaking off. *Typical form*

d. Bark of mature trunks warm-brownish, the outer layer only tardily flaking off. var. *commutata*

c. Branchlets pendulous; leaves narrowly ovate to nearly lanceolate, tapering to the petiole; pistillate catkins often in clusters of 2-4. var. *pensilis*

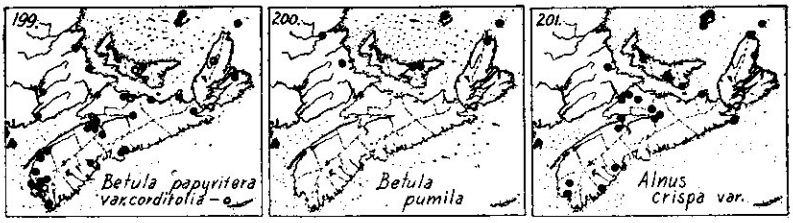
b. Mature fertile bracts 7-10 mm long; fruits 6-8 mm wide. var. *macrostachya*

a. Leaves heart-shaped at the base; mature fertile bracts 5-10 mm long; bark of mature trunks varying from a warm brown to a pinkish white. var. *cordifolia*

Common throughout; scattered in the original forest but commoner eastward and near the Bay of Fundy. It often comes in almost pure stands after a fire. Lab. to Alaska south to N.Y., Ill., etc.

Var. **commutata** (Regel) Fern. is found near the coast from Lab. to Mass. and in western N.A. south to Ore.

Var. **pensilis** Fern. is scattered through the center of the province, often rather common as along the South Mt. of the Annapolis Valley. "Small tree 10 ft. high, branches drooping," banks of the Lahave R., Bridgewater (Fernald, l. c.). Nfld. to Que. and south to N.Y.



Var. **macrostachya** Fern. The type collection is from dry mixed woods, Hectanooga, Digby Co. Nfld. south to Northern Me. and N. S.

Var. **cordifolia** (Regel) Fern. is scattered throughout near the coast; occasional in Yarmouth Co.; on Cape Blomidon; becoming common eastward and in C.B. Lab. to Ont. south to N.Y. and Wisc.

7. **B. borealis** Spach

The only collection known from the province is from a low thicket in the middle of a peat bog on the top of the plateau about 2 miles north of Bay St. Lawrence, Victoria Co.; Roland, 1941.

Lab. to James Bay south to northern Vt. and N. S.

8. **B. pumila** L. Map 200. BOG BIRCH.

Casual on St. Paul's Is. (Perry, 1931); scattered in bogs and heaths in northern C.B.; also in P.E.I. Macoun's report of "in bogs through N.S." is not substantiated by collections.

Nfld. to Assin. south to N.S., Ohio and Minn.

2. ALNUS B. Ehrh. ALDERS

Fernald, M.L. Eastern North American representatives of *Alnus incana*. Rhodora **47**: 333-360. Plates 976-989. 1945.

a. Buds sessile; pistillate catkins enclosed in the bud during winter; leaves with 6-8 pairs of main veins (Fig. 47, b). 1. *A. crispa*

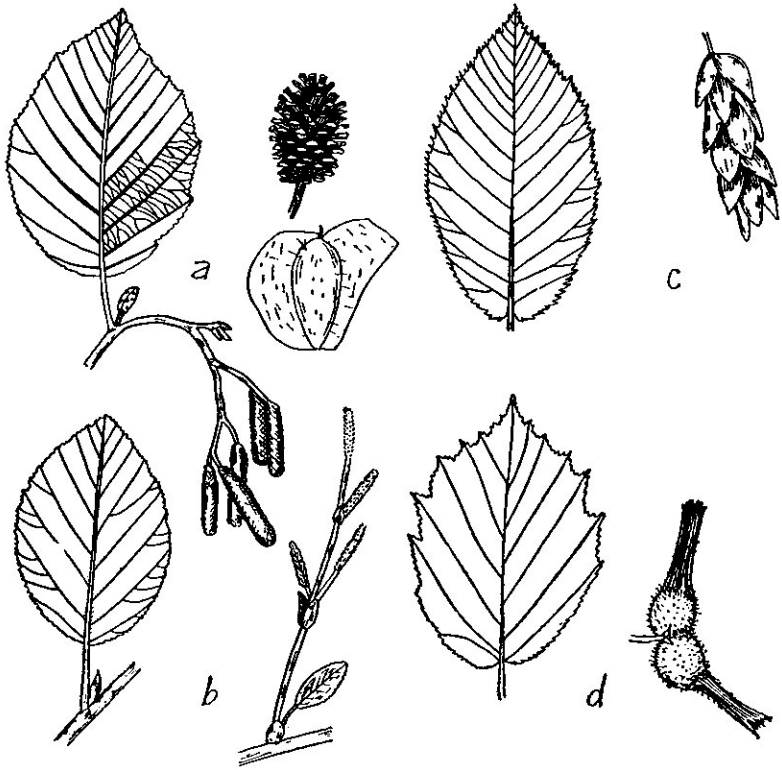


Fig. 47.—**Alnus.** a, **A. incana**, branch in autumn showing leaf, stalked bud, and naked overwintering staminate and pistillate cones, x ½; mature cone, x ½; fruit, x 5. b, **A. mollis**, leaf, and opening bud with pistillate cones, x ½. **Ostrya.** c, leaf and cluster of fruits, x ½. **Corylus.** d, leaf and fruit, x ½.

a. Buds stalked; pistillate catkins naked over winter; leaves with 8-11 pairs of main veins (Fig. 47, a).
b. Leaves broadest near or below the middle, with rounded or cordate bases, often doubly serrate, the mature blades with prominent cross-veins between the main ones. 2. *A. rugosa*
b. Leaves broadest above the middle, wedge-shaped or but slightly rounded at the base, sharply and almost regularly serrulate, the mature leaves finely reticulated with only weak cross-veins. 3. *A. serrulata*

1. **A. crispa** (Ait.) Pursh, var. **mollis** Fern., Rhodora **15**: 44. 1913. Fig. 47, b. Map 201. DOWNY ALDER.

Common throughout, abundant northwards and in C.B.; poorly-drained soils, mountain slopes, sea-shores, bluffs, headlands, deserted pastures and heath associations.

Nfld. to Lake Winnipeg south to Mass.

2. **A. rugosa** (DuRoi) Spreng. Fig. 47, a. SPECKLED ALDERS.

Low ground, the common alder in alluvial soil in the province; common throughout. The typical variety has the leaves greenish and not glaucous beneath. This is rare: Cedar L., Digby Co. and Eel L., Yarmouth Co. (Fernald, l.c.). Forma **Emersoniana** Fern. has the lower surfaces of the leaves permanently soft velvety instead of glabrous. This form is reported from Pleasant Valley, Yarmouth Co.; and from Bridgewater and Italy Cross in Lunenburg Co. N. S. to Mich. south to Penn. and Ind.

Var. **americana** (Regel) Fern. is the common N. S. alder, with the under sides of the leaves whitish and glaucous. Forma **hypomalaca** Fern. is scattered and intergrades. This has the lower surfaces of the leaves soft hairy or pilose instead of nearly glabrous. [*A. incana* (L.) Moench].

3. **A. serrulata** (Ait.) Willd.

Found by Weatherby (1942) growing in thickets on the banks of Cameron and First Christopher lakes, and along the shores of Ponhook L., in the center of Queens Co.

N. S.; central Me. to Mo. south to Fla. and La.

3. CORYLUS L. HAZEL

1. **C. cornuta** Marsh. Fig. 47, d. HAZELNUT.

Dry or open woods, generally distributed and often

abundant as an understory shrub. In northern C.B. it is found in the climax forest; and is likewise common under pines in the Annapolis Valley. It is common in roadside thickets, along edges of fields or margins of woods (*C. rostrata* Ait.).

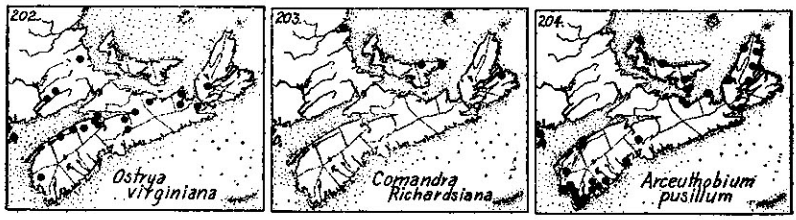
Nfld. to Sask. south to Ga. and Mo.

4. **OSTRYA** (Mich.) Scop.

1. O. virginiana (Mill.) K. Koch. Fig. 47, c. Map 202. HOP HORNBEAM.

Scattered from Annapolis Co. to C. B. often rather common in the center of the province, growing along the intervales and in alluvial soil; very rare elsewhere, and especially so in the acidic areas and the southwestern counties. Var. **glandulosa** (Spach) Sarg., bearing stalked glands on the young branchlets, petioles and peduncles, is the northern form. The distribution of this has as yet not been worked out.

N. S. to Minn. south to Fla. and Tex.



32. **FAGACEAE** BEECH FAMILY

a. Leaves coarsely serrate to nearly entire; nut triangular, surrounded by a 4-parted involucre. 1. *Fagus*

a. Leaves deeply lobed; nut round, surrounded at the base by a cup-like involucre. 2. *Quercus*

1. **FAGUS** L. BEECH

1. F. grandifolia Ehrh. BEECH. Fig. 48, c.

Very common throughout the northern hardwood area from Annapolis to northern C. B. mixed with maples or occurring in pure stands on the drier ridges and hilltops; scattered elsewhere. It is very variable as to the flowers

and fruit. Forma **pubescens** Fern. & Rehd. has the leaves more or less pubescent beneath; frequently found.

N. S. to Ont. and Wisc. south to Fla. and Tex.

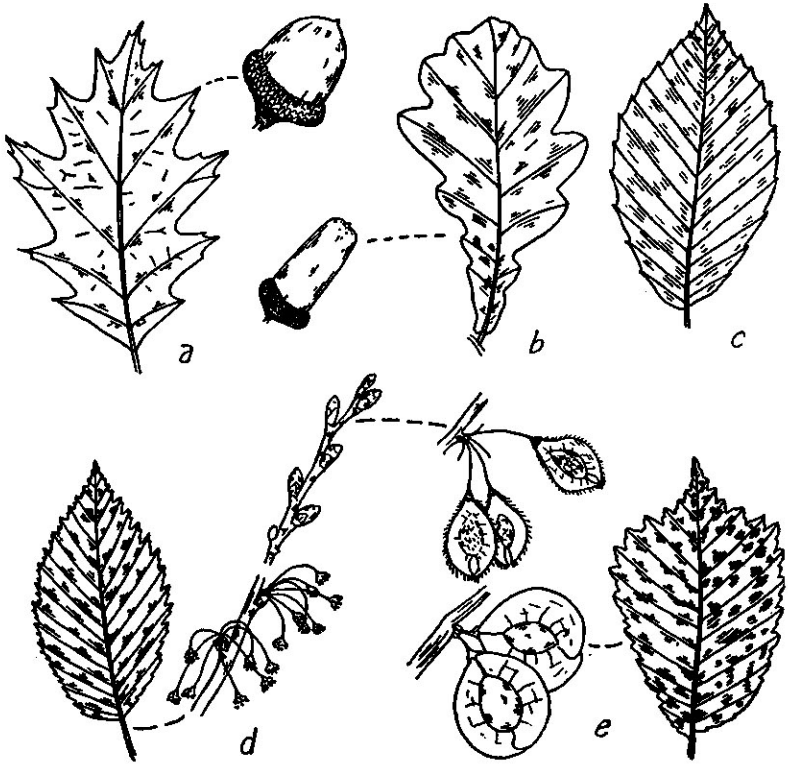


Fig. 48.—**Quercus.** a, **Q. borealis,** leaf, x ½; acorn, x ½. b, **Q. robur,** leaf and acorn, x ½. **Fagus.** c, leaf, x ½. **Ulmus.** d, **U. americana,** leaf, flowers, and winter buds, x ½; fruits, x 1. e, **U. glabra** leaf, and fruits, x ½. (?)

2. QUERCUS L. OAK

a. Lobes of the leaf rounded, not bristle-tipped; acorn oblong to elliptical. 1. *Q. robur*

a. Lobes of the leaf sharp, bristle-tipped; acorns about as wide as long.

b. Cup or involucre of the mature fruit 1.5-2 cm wide, conical at the base. 2. *Q. borealis*

b. Cup or involucre 2.5-3 cm wide, flattened at the base. *Q. borealis* var. *maxima*

1. Q. robur L. ENGLISH OAK. Fig. 48, b.

Scattered as a roadside tree, at least from Annapolis

to Halifax and Truro; occasionally spreading out into the bushes.

Introduced from Eu.

2. **Q. borealis** Michx. f. RED OAK. Fig. 48, a.

Throughout in light or well-drained soils; scattered in the granitic areas, local on the sands of the Annapolis Valley where it was apparently much commoner in the past; and scattered or local eastward to C. B. In some localities, as at Pleasant Bay and in the vicinity of Cape North, it forms an important constituent of the forest; in other regions it may be absent.

Var. **maxima** (Marsh.) Ashe, the southern extreme, is scattered in southwestern N. S.; dry woods near Canoe L., Yarmouth Co.; woods bordering Boot L., Annapolis Co. (Fernald, 1922).

N. S. to Minn. south to Penn. and Iowa.

33. ULMACEAE ELM FAMILY

1. ULMUS L. ELM

a. Branches soon rough and corky; petioles 5-8 mm long; flowers on pedicels 1-2 cm long, with 7-8 stamens; fruit about 1 cm long, fringed. 1. *U. americana*

a. Branches long remaining smooth, yellowish; petioles 3-6 mm long; flowers in clusters, with 5-6 stamens; fruit broad, 2-2.5 cm long, smooth. 2. *U. glabra*

1. **U. americana** L. AMERICAN ELM. Fig. 48, d.

Scattered throughout on the intervals, best developed along the river valleys of the central and northern counties. It is extensively planted as a shade tree; and these introduced trees are very variable in shape of tree and in the leaves.

Nfld. to Fla. west to the Rockies.

2. **U. glabra** Huds. SCOTCH ELM. Fig. 48, e.

Very common in the towns and villages where it is planted as an ornamental tree. (*U. campestris* L.). Newer species such as the Chinese Elm are now replacing it.

Introduced from Eurasia.

34. URTICACEAE NETTLE FAMILY

a. Leaves opposite.

b. Leaves toothed, not lobed; plants erect, with stinging hairs; flowers clustered in the leaf-axils (Fig. 49, a, b). 1. *Urtica*

b. Leaves deeply and palmately 3-5-lobed; plants twining; fertile flowers in a membranous cone, the seeds invested by scale-like sepals; hop (Fig. 49, d). 2. *Humulus*

a. Leaves alternate; woodland plants with stinging hairs (Fig. 49, c). 3. *Laportea*

1. **URTICA** (Tourn.) L. NETTLE

a. Plants annual, 1-4 dm high, usually much branched; petiole one-half the length of the blade or longer; inflorescence short, open, with widely divergent branches. 1. *U. urens*

a. Plants perennial, 1-3 m high, little or not at all branched; petiole relatively short; inflorescence long, with ascending branches.

b. Leaves plainly cordate at the base, coarsely toothed with 13-18 teeth; lower surface of blades and upper part of the stem densely setulose and very pilose (Fig. 49, a). 2. *U. dioica*

b. Leaves rounded at the base; lower surface of blades and the upper part of the stem sparingly or not at all setulose, glabrous and finely pilose.

c. Petiole slender and elongate, 2-5 cm long; blade averaging 17 pairs of teeth, nearly glabrous beneath, rather thin and wide. 3. *U. gracilis*

c. Petiole stout, 0.5-2 cm long; blade averaging 25 pairs of teeth, cinereous-puberulent beneath, often thickish (Fig. 49, b). 4. *U. procera*

1. **U. urens** L.

Occasionally introduced as a weed about towns and in waste places, especially in the eastern part of the province.

Native of Eu.; widely introduced.

2. **U. dioica** L. STINGING NETTLE. Fig. 49, a.

Waste places and roadsides, mostly near towns; rather common throughout, and the commonest member of the genus.

Introduced from Eu. into eastern U. S. and Can.

3. **U. gracilis** Ait., see Fernald, Rhodora **28**: 191-199. 1926, for discussion of this and the following species.

The status of this northern extreme is uncertain. It may be merely an ecological variation, but in general it appears distinct. Collections by Macoun from Big Intervale, C. B. and by Hamilton from Boylston, Guysborough Co., are placed here. The plant ranges from Nfld, to northern Me. and N. Y. and from Alta. and B. C. southward. (*U. Lyallii* Wats.).

4. **U. procera** Muhl. TALL NETTLE. Fig. 49, b.

Open woods, damp thickets, along roadsides and edges of fields in organic and muck soils where the moisture and fertility is high; scattered throughout, but rarely abundant. (*U. gracilis* of Gray's Manual).

N. S. and Que. to N. D. south to N. C. and La.

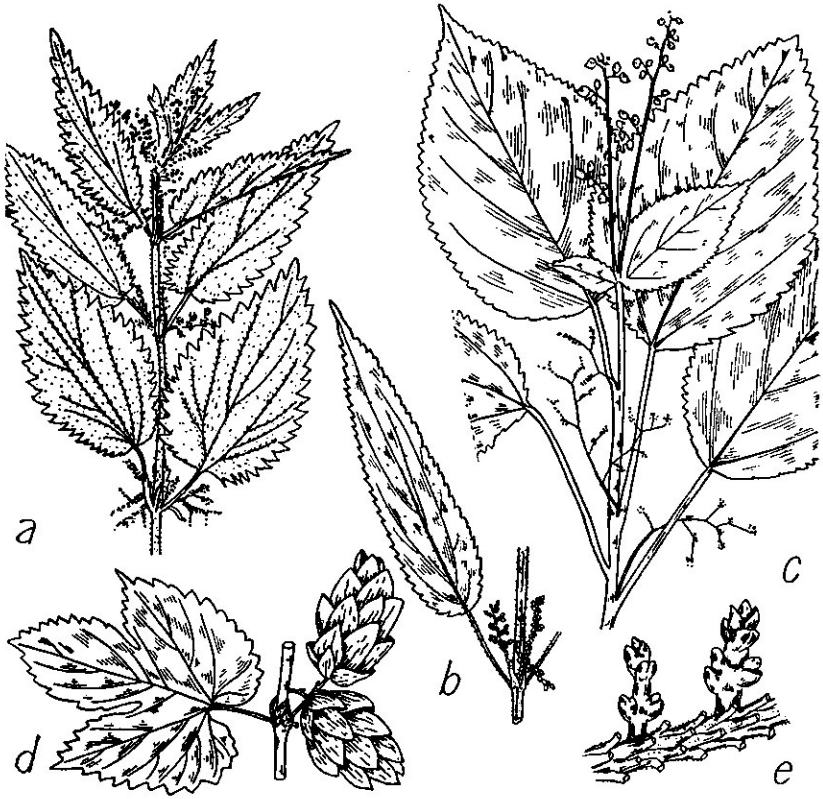


Fig. 49.—**Urtica.** a, **U. dioica,** tip of plant, x 1/3. b, **U. procera,** x ½. **Laportea.** c, top of plant, x ½. **Humulus.** d, leaf and fruit, x ½. **Arceuthobium.** e, plants on black spruce, x 3.

2. **HUMULUS** L. HOP

1. **H. Lupulus** L. COMMON HOP. Fig. 49, d.

Formerly planted; occasionally found around old dwellings, in waste places and rarely as an escape. Two kinds of hops have been introduced into the province for which the following key is given.

Lobes of the leaves short-acute or blunt at the apex, with the terminal lobe nearly as wide as long; blades toothed with the under side sparsely glandular. *H. Lupulus*

Lobes of the leaves attenuate, the terminal one narrowed below the middle and about twice as long as wide; blades more finely toothed and copiously glandular beneath. *H. americana*

3. **LAPORTEA** Gaud

1. **L. canadensis** (L.) Gaud. WOOD NETTLE. Fig. 49, c.

Alluvial woods in Hants Co.; rare in Kings Co.; scattered near Truro; characteristic of the higher parts of flood plains in northern C. B. (Nichols, 1918).

N. S. to Ont. and Minn. south to Fla. and Kans.

35. **SANTALACEAE** SANDALWOOD FAMILY

a. Rootstocks corky or papery; flowers in terminal corymbs or umbels; style filiform and prolonged; fruit a dry and coriaceous nut. 1. *Comandra*

a. Rootstocks smooth and brown; flowers 1-3 in the axils of the middle leaves; style conical and very short; fruit juicy and drupe-like. 2. *Geocaulon*

1. **COMANDRA** Nutt.

1. **C. Richardsiana** Fern. BASTARD TOAD FLAX. Map 203.

Rare: the only specimen seen was collected by Macoun in 1883 in damp sandy soil, Sydney Mines, C. B.

Nfld. to Man. south to Ga.; and B. C. to Calif.

2. **GEOCAULON** Fern.

1. **G. lividum** (Richards.) Fern., Rhodora **30**: 21-24. 1928.

Occasional; marsh, six miles north of Halfway House, C. B., Macoun 1898; sandy shores, Kingston, Kings Co., Macoun 1883; St. Paul Is., Perry and Roscoe, 1930. Bogs, sterile soil, and damp sands.

Lab. to Alaska south to N. S., N. B. and the mts. of N. Eng.

36. LORANTHACEAE DWARF MISTLETOE FAMILY

L. ARCEUTHOBIUM Bieb.

1. **A. pusillum** Peck. DWARF MISTLETOE. Map 204. Fig. 49, e.

This small parasitic plant seriously injures the trees and forms irregular witches'-brooms on much of the spruce along the Atlantic Coast from Yarmouth to northern C. B.; rarer inland.

Nfld. to Mich. south to Penn.

37. POLYGONACEAE BUCKWHEAT FAMILY

a Sepals 6, the outer reflexed, the inner 3 erect and much enlarged in fruit (except in *R. Acetosella*); stigmas tufted; plants erect with much-branched terminal inflorescence (Fig. 50). 1. *Rumex*

a. Sepals 5 or 4, erect, not enlarging; stigmas not tufted.

b. Flowers axillary or in narrow terminal panicles; leaves not hastate, or else hastate and very prickly; achenes usually enclosed by the sepals (Fig. 51, 52). 2. *Polygonum*

b. Flowers in axillary or terminal panicles; leaves hastate, not prickly; achenes much exserted; buckwheats. 3. *Fagopyrum*

1. RUMEX L. SORRELS AND DOCKS

Rechinger, K. H. The North American species of *Rumex*. Field Mus. Bot. Series **17**: **1**: 1-151. 1937. St. John, Harold. *Rumex persicarioides* and its allies in North America. Rhodora **17**: 73-83. 1915.

a. Leaves with flaring or backward-pointing lobes at the base, making them hastate- or halberd-shaped; sorrels.

b. Leaves with the basal lobes flaring outward; plants small, slender to 4 dm high; valves (outer sepals) small, not larger than the achene (Fig. 50). 1. *R. Acetosella*

b. Leaves with the basal lobes not flaring, halberd-shaped; plant to 10 dm high; valves about 5 mm wide (Fig. 50). 2. *R. Acetosa*

a. Leaves tapering or heart-shaped at the base, not lobed: coarse, large plants; docks.

c. Stem with leafy shoots in the axils of the leaves; plants decumbent or ascending with thickish leaves; seashores (Fig. 50). 3. *R. pallidus*

c. Stems without axillary shoots.

d. Valves of the fruit without enlarged tubercles, or with one diminutive one.

e. Basal leaves very large, the blades almost orbicular, broadly rounded at the apex and deeply and broadly cordate at the base. 4. *R. alpinus*

e. Basal leaves smaller, lanceolate.

f. Valves rounded, often broader than long, one sometimes with a diminutive grain. 5. *R. domesticus*

f. Valves round-cordate, longer than wide, never with a suggestion of a grain. 6. *R. occidentalis*

d. Valves of the fruit with at least one distinct grain and usually with 3.

g. Valves not toothed.

h. Leaves broad, flat, the veins nearly at right-angles to the midrib and distinct for half way to the margin; grain longer than broad; pedicel with an obscure joint (Fig. 50). 7. *R. orbiculatus*

h. Leaves lanceolate, crisped and undulate, the veins oblique and soon branching; grain to 1.5 times longer than wide; pedicel with a conspicuous joint (Fig. 50). 8. *R. crispus*

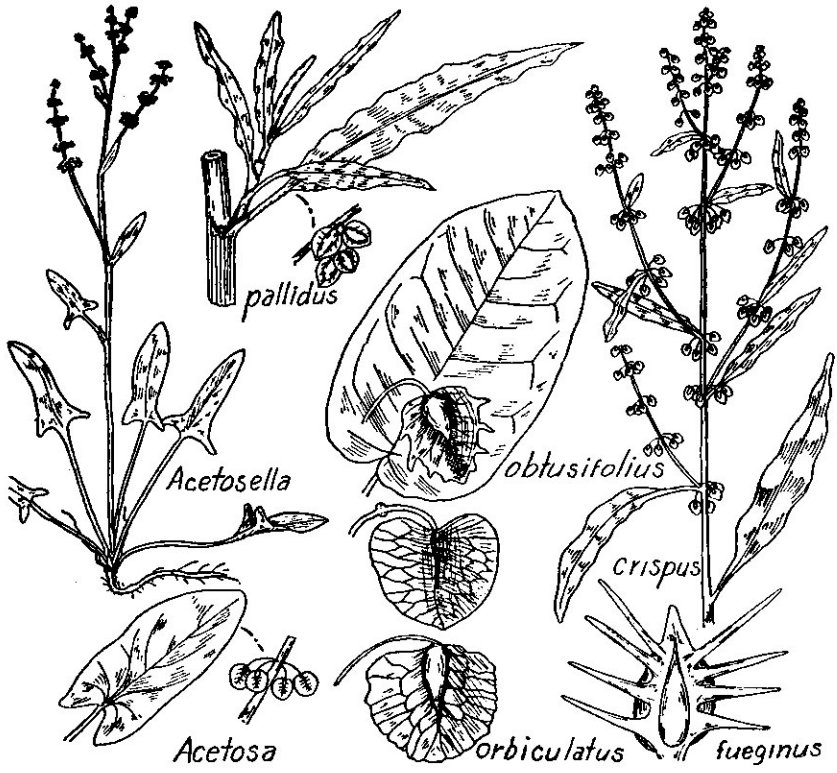


Fig. 50.—**Rumex.** Habit sketches, x ½. Large fruits, x 3, the unlabelled one is **R. domesticus.**

g. Valves of the fruit plainly toothed.
i. Teeth of the valve shallow, much shorter than the width of the central portion; plants tall, common weeds.
j. Lower leaves broad and rather blunt (Fig. 50).
9. *R. obtusifolius*

j. Lower leaves oblong-lanceolate, acute.
R. obtusifolius var. *sylvestris*

i. Teeth of the valves needle-like, several times the width of the central portion; plants usually prostrate, found near salt water (Fig. 50). 10. *R. fueginus*

1. **R. Acetosella** L. SHEEP SORREL. Fig. 50.

Very common throughout in fields, roadsides, burnt lands and even in barrens, apparently growing wherever the competition of other plants is reduced or lacking.

Introduced from Eu.; throughout N. A.

2. **R. Acetosa** L. GARDEN SORREL, SOUR DOCK. Fig. 50.

Thoroughly naturalized and abundant in fields and meadows around Yarmouth, Windsor, Truro and at many other places in the Annapolis Valley and along the South Shore. It is a very conspicuous and rapidly spreading weed. June.

Introduced from Eurasia; locally abundant in northeastern America and scattered elsewhere.

3. **R. pallidus** Bigel. WHITE DOCK. Fig. 50.

Sea-beaches; known from rocky or gravelly beaches in Yarmouth and Shelburne Cos.; about the shores of C. B. and the Bras d'Or Lakes.

Nfld. and Que. to Me.; Bruce Penninsula; Northwest Coast.

4. **R. alpinus** L.

Established in old fields at Rockville, Yarmouth Co.; a local introduction into Pictou Co., looking like a poor quality rhubarb.

Introduced from Eu.; unknown elsewhere in N. A.

5. **R. domesticus** Hartm. Fig. 50.

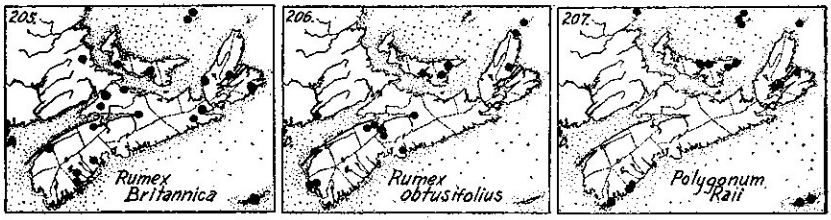
Scattered to rare throughout; about houses, in fields and waste places (*R. Patientia* L.).

Introduced from Eu.; Nfld. to Me.; Wisc. to Alaska.

6. **R. occidentalis** Wats.

Scattered, and with the distribution not well known. This species is wide-ranging across Canada and the U. S.

7. **R. orbiculatus** L., see Fernald, Rhodora **47**: 133-137. 1945. Map 205.



Scattered to rather common throughout; swamps, edge of fresh-water ponds, around lake borders, often in cat-tail swales. Ganong places it among the subordinate species in the timothy fields of the dykelands; and Nichols lists it as characteristic of the estuaries of northern C. B.

Rechinger separates the stouter, lower, often thick leaved plants with a compact short inflorescence, growing in northeastern N. S., as var. **borealis** Rech., Field Mus. Nat. Hist. Bot. Series **17:1**: 125. 1937. The only N. S. plant listed is a collection of St. John's; from the swampy edge of a fresh water pond, Sable Is. (*R. Brittanica* L.).

Widespread.

8. **R. crispus** L. CURLED DOCK. Fig. 50.

Common throughout; waste places, cultivated land, along roadsides and about dwellings. *R. elongatus* Guss. is now considered to be but a variation of this species.

Introduced from Eu.; throughout temperate America.

9. **R. obtusifolius** L. BLUNT-LEAVED DOCK. Map 206. Fig. 50.

Rather common as a weed; roadsides, fields and waste places. Var. **sylvestris** (Lam.) Koch was reported (Fernald, 1921) from Sandy Cove, Digby Co.; and from Charlottetown, P. E. I.

Introduced from Eu ; Nfld. to B.C. south to Fla.

10. **R. fueginus** Philippi. Fig. 50.

Rare around the coast in Halifax, Kings and Cumberand Co.; abundant on Sable Is. on the brackish border of Wallace L., and on fields where sea-weed is used as fertilizer. Plants about the Gulf of St. Lawrence with the bristles about equal to the breadth of the valves, and the tubercles turgid, more ellipt c and straw-colored have been placed in *R. persicarioides* L. This is common in brackish edges of

marshes in P. E. I. and may occur along the North Shore of N. S.

Que. to R. I.; Wisc. to B. C. south to Ill., Kans. and Ga.

2. **POLYGONUM** (Tourn.) L. KNOTWEED

a. Stems not twining.
b. Stems not armed with prickles.
c. Flowers borne in the axils of the leaves (Fig. 51, a).
d. Plant erect, rather sparingly branched with the branches ascending.

Plant 3-9 dm high; leaves narrowly lanceolate to linear, acute to acuminate at both ends; salt marshes (Fig. 51, a). 1. *P. exsertum*

Plant 1-3 dm high; leaves oval to elliptical; yards and roadsides. 9. *P. monspeliense*

d. Plant prostrate or diffusely spreading.
e. Plant very glaucous so that the foliage and stem are whitened; flower petaloid with whitish or pinkish sepals; sea-shores.

Stipules more than 10 mm long, often longer than the internodes; achenes about 3 mm long. 2. *P. glaucum*

Stipules 4-8 mm long, much shorter than the internodes; sepals conspicuously petaloid; achenes 4.5-5.3 mm long (Fig. 51, c). 3. *P. Raii*

e. Plants slightly or not at all glaucous; flowers less petaloid.
f. Achenes smooth and shining, olivaceous; seashores.

Mature achenes 3.5-6 mm long.

Ochrae (leaf sheaths) 10-15 mm long; achenes 6 mm long; leaves linear to oblong-lanceolate, 1-nerved beneath, 2-7 mm wide; sepals prominently petaloid. 4. *P. acadiense*

Ochrae 7-10 mm long; achenes 3.5-4.8 mm long; leaves large, elliptic, 4-15 mm wide, with about 5 pairs of veins; sepals hardly whitened-margined. 5. *P. allocarpum*

Mature achenes up to 4 mm long, very broadly ovate; ochrae 3-6 mm long; leaves narrowly elliptical, smaller and less veiny than the preceeding (Fig. 51, b). 6. *P. Fowleri*

f. Achenes finely striate; plants widely distributed.

Perianth 2.5-3.5 mm long; achenes 2.5-3.5 mm long, acute; leaves 2-4 cm long, oblong-lanceolate; plant stouter (Fig. 51, d). 8. *P. aviculare*

Perianth 2-2.5 mm long; achenes 2-2.5 mm long; leaves mostly less than 2 cm long, linear to linear-lanceolate; plant slender. 7. *P. neglectum*

c. Flowers in terminal spikes or axillary inflorescences.
g. Plants shrubby at the base, 3-15 dm high; leaves large, cordate at the base; ornamentals or escapes.

Flowers in loose axillary racemes; leaves round-ovate (Fig. 51, e). 27. *P. cuspidatum*

Flowers in a dense large terminal compound inflorescence; leaves oblong-lanceolate. 28. *P. polystachyum*

g. Plants little or not at all shrubby at the base; much lower; leaves, rarely cordate.

h. Plants perennial, often trailing for a dm or more; spikes 1-3, very dense, 8-14 mm thick.

Sheaths with a spreading green border at the top. 13. *P. amphibium* var. *stipulaceum*

Sheaths without a green border.

Peduncles smooth; leaves floating, elliptic, obtuse or slightly acute, tapering to the base; spikes 1-5 cm long (Fig.52, a). 13. *P. amphibium* fo.ma *fluitans*

Peduncles hairy, the hairs often glandular-tipped; leaves lanceolate, acute to long-attenuate nearly glabrous to scabrous; spikes 3-18 cm long.

Leaves harshly scabrous, 1-3 cm wide; petiole 0.5-1 cm long, attached near the top of sheath. 13. *P. amphibium*,

Leaves pubescent, 3-6 cm wide; petiole 3-6 cm long; attached near the base of the sheath. 14. *P. coccineum*

h. Perennial or annual plants, usually small and more slender spikes several to numerous, less than 10 mm thick.

i. Peducles with glands below the spike; sheath not ciliate; stamens 6 (Fig. 52, b).

j. Glands not stalked, appearing gummy, often nearly absent.

Leaves glabrous or scabrous below; peduncles usually smooth or with a few sessile glands; spikes 3-8 cm long, drooping; achenes less than 2 mm wide. 11. *P. lapathifolium*

Leaves, at least the lower ones, with woolly hairs beneath; peduncles with sessile glands; spikes 1-3 cm long, erect; achenes more than 2 mm wide. 12. *P. scabrum*

j. Glands stalked (Fig. 52, e); achenes 2.2-3.5 mm wide.

Leaves copiously strigose-pubescent beneath and often so above; achenes mostly 2.2-2.8 mm wide. 15. *P. pensylvanicum*

Leaves smooth or becoming so; achenes mostly 2.5-3.5 mm wide. *P. pensylvanicum* var. *laevigatum*

i. Peduncles without glands below the spike.

k. Sheaths not ciliate, except rarely the uppermost.

Leaves oblong to obovate, mostly basal; stem-leaves clasping; spike short, thick, erect. 10. *P. Bistorta*

Leaves lanceolate, scattered on the stem; spike long and slender, drooping.

Plants erect.

Leaves glabrous or nearly so beneath. 11. *P. lapathifolium*

Leaves more or less flocculose-woolly beneath.
P. lapathifolium var. *salicifolium*

Plants prostrate, diffusely branched.
P. lapathifolium var. *prostratum*

k. Sheaths ciliate with a row of bristles (except one Sable Is. variety of P. hydropiperoides); Fig. 52, c.

l. Sepals not dotted with dark glands.

m. Upper part of the internodes of the stem usually glabrous; spikes erect, 1-4 cm long, the flowers crowded.

Plant slender, much branched; spikes 4-6.5 mm thick; achenes 2 mm wide; perianth smooth or barely nerved; rare. 19. *P. puritanorum*

Plant stouter; spikes 7-11 mm thick; achenes 2.5-3 mm wide; mature perianth usually reticulated or strongly nerved at the base; common weed. 20. *P. Persicaria*

m. Upper part of the internodes more or less stiff-hairy just below the node; spikes more or less drooping, 5-7 cm long, the flowers loose or dense; plant long-trailing, perennial.

Leaves pubescent on the midrib and margins; sheaths ciliate.

Plant 1-1.5 m high; leaves lanceolate-attenuate, 1-2 dm long; spikes dense, 5-10 mm thick, crowded at the tips of the branches.
P. hydropiperoides var. *digitatum*

Plant 3-10 dm high; leaves lanceolate, shorter; spikes slender, nearly filiform. 21. *P. hydropiperoides*

Leaves glabrous and comparatively short; sheaths smooth, without cilia; Sable Is.
P. hydropiperoides var. *psilostachyum*

l. Sepals dotted with dark glands.

n. Achene rough and dull; plant purplish, the internodes 2-4 cm long; leaves thin; ocreolae of the upper flowers usually not ciliate.

Pedicels hidden in the ocreolae; achenes mostly 3-3.5 mm long (Fig. 52, c). 16. *P. Hydropiper*

Pedicels exserted from the ocreolae; achenes 2-3 mm long. *H. Hydropiper* var. *projectum*

n. Achenes shining; plant yellow-green, with the internodes 3-8 cm long; ocreolae of the upper-most few florets usually ciliate.

Plant annual, not generally prostrate at the base; stamens 3-8; achenes mostly flat on one side and rounded on the other. 17. *P. punctatum*

Plant perennial, the lower nodes prostrate, rooting; stamens 8; achenes mostly 3-angled. 18. *P. robustius*

b. Stem armed with stout recurved prickles.

Leaves sagittate, the basal lobes not flaring outward; peduncle smooth; achenes triangular (Fig. 51, f). 23. *P. sagittatum*

Leaves hastate with wide-flaring lobes; peduncles glandular; achenes lenticular (Fig. 52, g). 22. *P. arifolium*

a. Stems twining.
o. Calyx not prominently keeled in fruit.
p. Seed smooth and shining; sheaths fringed at the nodes with downwardly-pointing hairs (Fig. 52, f).
q. Plant long-trailing; flowers in axillary clusters. 25. *P. cilinode*
q. Plant short and erect; flowers mostly in terminal racemes. *P. cilinode* forma *erectum*
p. Seed dull and minutely striate; sheaths at the nodes not fringed at the base (Fig. 52, d). 24. *P. Convolvulus*
o. Calyx widely keeled in fruit; plant long-trailing; sheath not fringed at the base; seed smooth and shining. 26. P. *scandens*

1. **P. exertum** Small, including *P. ramosissimum* Michx. Fig. 51, a.

Occasional to common near the edges of the salt marshes around the Bay of Fundy and northward.

N. S. to Minn. south to N. J.

2. **P. glaucum** Nutt., see Fernald, Rhodora **15**: 68-73. 1913.

This very glaucous variant of the European *P. maritimum* is found along the coast of eastern N. B. and southward. Its distribution in N. S. is unknown, but it should be looked for along the North Shore.

3. **R. Rail** Babington. Map 207. Fig. 51, c. See Fernald, l. c. 1913.

Damp sands and gravels of the coast in Shelburne and Queens Cos.; through the Bras d'Or Lakes, and one plant found on St. Paul Is.; known from one collection from Sable Is., possibly from brackish dune hollows.

Lab. to southern Me.; coast of the British Isles and Channel Coast of the continent.

4. **P. acadiense** Fern., Rhodora **16**: 188. 1914.

Very rare on the beaches of the Great Bras d'Or Lake at Kidstone Island, and from the original station at Grand Narrows; elsewhere very local in eastern N. S.

5. **P. allocarpum** Blake, Rhodora **19**: 234. 1917. Map 208.

Typical of sand flats and sea-beaches from Queens Co. around the coast to the head of the Bay of Fundy, recognised by its large leaves, lack of glaucosity, and large shiny

Fig. 51.—**Polygonum,** all x ½. a, **P. exsertum.** b, **P. Fowleri.** c, **P. Raii.** d, **P. aviculare.** e, **P. cuspidatum.** f, **P. sagittatum.** g, **P. arifolium.**

achenes. This species shou'd be generally distributed.

Nfld. to P. E. I. and south along the coast to Me.

6. **P. Fowleri** Robinson. Fig. 51, b.

Scattered around the coast, at least from Kings Co. to Yarmouth Co. and to northern C. B.; not known from Sable Is. (St. John).

Strait of Belle Isle along the outer coast and the lower St. Lawrence to central Me.

7. **P. neglectum** Besser

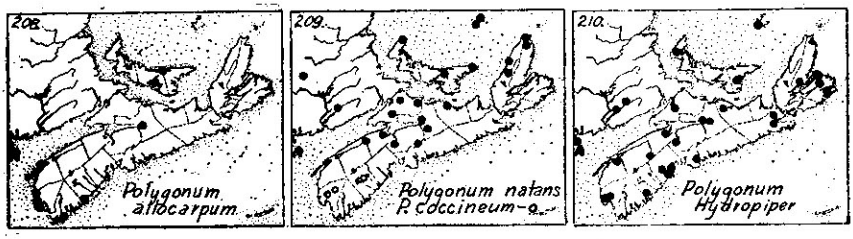
The distribution of the species of the section *Avicularia* have been little studied in N. S. Much of the material labelled *P. aviculare* belongs here, so that *P. neglectum* is common around the sea-shores and probably throughout (*P. aviculare* var. *angustissimum* Meisn.).

Native of Eu.; widely distributed.

8. **P. aviculare** L. BARNYARD KNOTWEED. Fig. 51, d.

Common throughout; waste places, along roadsides, yards, etc.

Throughout N. A. and in Eurasia.



9. **P. monspeliense** Thiebaud

Common in much the same situations as the last. (*P. aviculare* var. *vegetatum* of Gray's Man.?).

Introduced from Eu.; becoming common.

10. **P. Bistorta** L. EUROPEAN BISTORT.

Known only from several established clumps in Victoria Park, Truro; introduced.

Eurasia.

11. **P. lapathifolium** L.

Scattered as a weed in cultivated fields and along roadsides. Var. **salicifolium** Sibth. is commoner in the province than the species and is perhaps merely a juvenile form of it. It is common in damp sands and pond-margins in Yarmouth and Shelburne Cos., and scattered elsewhere. Var. **prostratum** Wimmer is known only from brackish beaches on Sable Is.

Throughout temperate N. A.; Eu.

12. **P. scabrum** Moench. Fig. 52, b.

Damp fields and cultivated land; a common weed in the Annapolis Valley and scattered elsewhere (*P. tomentosum* Schrank).

Nfld. to B. C. south to N. J., the Great Lakes and Calif.

13. **P. amphibium** L. WATER KNOTWEED. Fig. 52, a. Map 209. Stanford, Rhodora **27**: 156-166. 1925, for th s and the following species. Fernald in Rhodora **48**: 49-53. 1946.

The species is European. A single introduction is known in N. A.; roadside bank in rubbish near railroad, Yarmouth, Sept. 1, 1920 (Stanford, l. c. page 158).

The American plants are placed in var. **stipulaceum** Coleman [Var. *Hartwrightii* (Gray) Bissell]. This is the wide-ranging form with the conspicuous spreading green border at the top of the leaf sheath. In N. S. it is found wherever the floating form, which is the commonest one, grows out onto dry land at the side of a pool or river-bank. Occasionally plants growing in swales or meadows do not show the spreading green border and strongly resemble the European plant. These are named forma **simile** Fern. They vary, on the average, by having the leaves less harshly pubescent, the leaves lanceolate and more shortly petioled, and the flowering spikes stouter and shorter. Plants found at the bottom of cat-tail marshes near Pugwash belong here.

Our common floating form is forma **fluitans** (Eaton) Fern. (*P. natans* Eaton). This is found in shallow water in marshes, muddy borders of ponds or lakes, slow streams and bottoms of cat-tail swales: Annapolis Co. to Amherst and northern C. B., becoming more common northwards where it often occurs in large pure colonies at the edges of the ponds or lakes.

Nfld. to Sask. south to Penn.; B. C. to Calif.

14. **P. coccineum** Muhl., forma **terrestre** (Willd.) Stanford, Rhodora **27**: 162. 1925. Map 209.

The terrestrial form of this species is the only one known in the province, while the aquatic form is more southern and sterile. Rocky swales, mucky sloughs, and wet savannahs; scattered in Yarmouth Co.; along the Medway River system in Queens Co. [*P. Muhlenbergii* (Meisn.) Wats.].

N. S. to Wash. south to Va., Ark. and Calif.

15. **P. pensylvanicum** L., see Stanford, Rhodora **27**: 173-184. 1925. Fig. 52, e.

"Exsiccated clay roadway bordering salt marsh, Annapolis Royal; first record from east of Mass., previous records belonging to var. *laevigatum* Fern." (Fernald, 1922). Mass. to southern Ont. south to the Gulf of Mexico.

Var. **laevigatum** Fern., Rhodora **19**: 73. 1917, is a common weed in cultivated fields and gardens. Forma **albineum** Farw. with white flowers, and forma **pallescens** Stanford with pinkish flowers and yellowish glands (See Rhodora **19**: 93. 1917 and Rhodora **27**: 180. 1927) are both present.

N. S. to Colo. southwards.

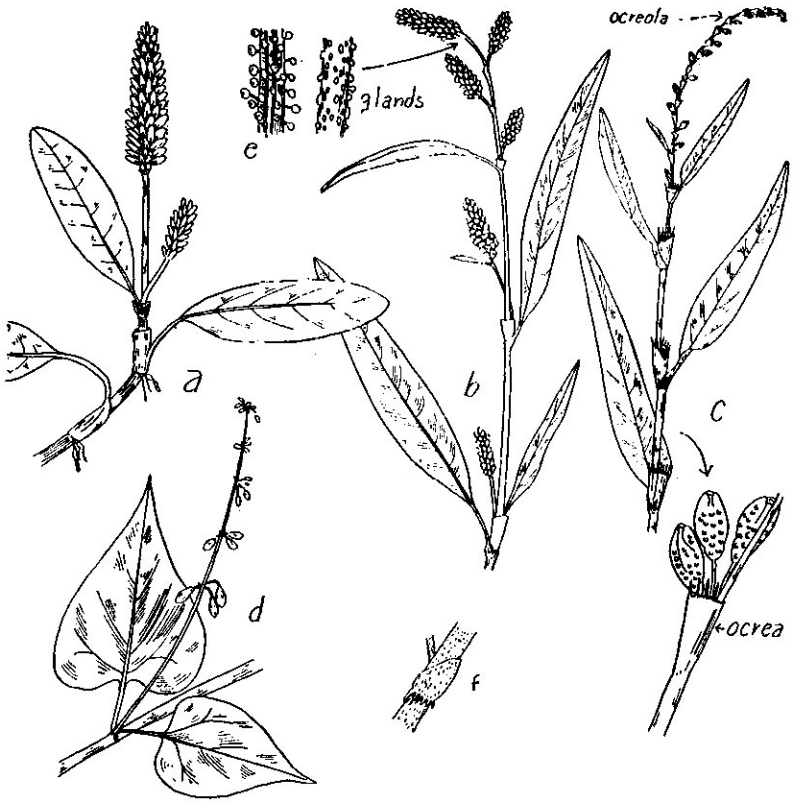


Fig. 52.—**Polygonum.** a, **P. natans,** x 1/3. b, **P. scabrum,** x ½. c, **P. Hydropiper,** x ½. d, **P. Convolvulus,** x ½ e, **P. pensylvanicum,** glands of the peduncle much enlarged. f, **P.. cilinode,** x 1

16. **P. Hydropiper** L. WATER PEPPER. Map 210. Fig. 52, c.

Scattered throughout in low, damp or exsiccated ground. Introduced from Eu.; widely distributed.

Var. **projectum** Stanford, Rhodora **29**: 86. 1927, is common throughout in wet places, damp roadsides, in the shade of buildings, etc. N. S. to Wisc. south to Ga.

17. **P. punctatum** Ell., including var. *leptostachyum* Meisn.

Common throughout; marshes, edges of lakes along streams, etc. (P. *acre* HBK.).

Widespread and common.

18. **P. robustius** (Small) Fern., Rhodora **23**: 147. 1921. Map 212.

Scattered in the southwestern counties at the edges of

lakes and streams; common in the Annapolis Valley along the rivers. The larger size, white flowers and late blooming set it off from the preceeding species.

N. S.; Mass. to the Gulf of Mexico; Mississippi Valley.

19. **P. puritanorum** Fern., Rhodora **21**: 141. 1919.

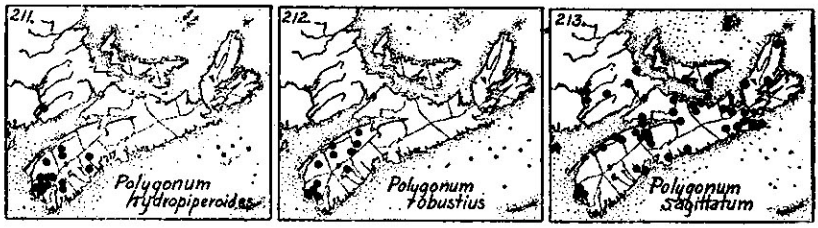
Annapolis Co.; in sand or gravel among granite boulders, beach of Grand Lake; first record outside of southeastern Mass. (Fernald, 1922).

Local; N. S., Me. and Mass.

20. **P. Persicaria** L. LADY'S THUMB.

Common weed in fields and waste places throughout.

Introduced from Eu.; throughout N. A.



21. **P. hydropiperoides** Michx. Map 211.

Common in the southeastern counties east to Annapolis and Lunenburg Co.; lake margins, beaches, and edges of rivers or streams.

Var. **digitatum** Fern., Rhodora **23**: 260. 1921, is found on a boggy savannah bordering St. John Lake, Springhaven, Yarmouth Co.; flowering very late. Var. **psilostachyum** St. John, Proc. Boston Soc. Nat. Hist. 1921: 71, is known only from Sable Is. *P. hydropiperoides* X *P. robustius* is reported (Fernald, 1922) as occurring in great abundance in peat and granite gravel bordering the outlet of Lamb's Lake, Annapolis Co.

N. S. to Minn. and Calif., south to the Gulf of Mexico.

22. **P. arifolium** L., var. **pubescens** (Keller) Fern., Rhodora **48**: 53. 1946. Fig. 51, g.

Scattered to local in rich thickets, usually under alders; Kings, Colchester and Cumberland Cos. (Var. *lentiforme* Fern and Griscom).

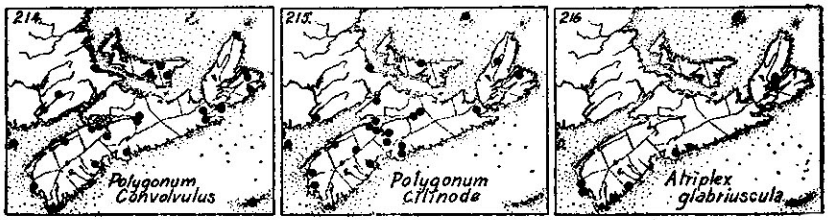
N. S. and P. E. I. south to N. J. and Penn.; the northern variety.

23. **P. sagittatum** L. TEAR-THUMB. Map 213. Fig. 51, f.

Very common throughout, developing late in the season.

Widespread in N. A.; Asia.

24. **P. Convolvulus** L. BLACK BINDWEED. Map 214. Fig. 52, d.



A common weed in fields, clearings and waste places. Naturalized from Eu.; widespread.

25. **P. cilinode** Michx. Map 215.

Scattered throughout in clearings, waste ground and low cultivated ground. Forma **erectum** (Peck) Fern., Rhodora **48**: 54. 1946, is a dwarf form occasionally found along roadsides.

N. S. to Minn. and Man. south to N. C.

26. **P. scandens** L.

Local, but probably widespread; low thickets along river intervales, often becoming luxuriant after woods have been cleared or the ground disturbed.

Widespread; also n Japan.

27. **P. cuspidatum** Sieb. and Zucc. JAPANESE KNOTWEED. Fig. 51, e.

Roadsides and waste ground from Yarmouth to Halifax and Truro; frequently common, freely escaping, and often becoming a noxious weed (*P. Zuccarinii* Small).

Introduced from Asia; widely planted as an ornamental.

28. **P. polystachyum** Wall.

This garden perennial, with its very long caudate-tipped and truncate-based leaves, is beginning to spread to waste lands about Yarmouth (Fernald, 1921). Introduced as an ornamental.

3. FAGOPYRUM (Tourn.) L. BUCKWHEAT

a. Flowers in scattered, elongated, loose racemes; perianth divisions 1-2 mm long, greenish; achenes dull and roughish. 1. *F. tataricum*

a. Flowers crowded in clustered, terminal racemes; perianth divisions 2-3 mm long, whitish, conspicuous; achenes smooth and shining. 2. *P. esculentum*

1. **F. tataricum** (L.) Gaertn. BUCKWHEAT.

Scattered throughout in fields, waste places and roadsides. It is commonly planted and often persists for a few years and then gradually disappears. It does not seem to persist as a bad weed.

Introduced from Eurasia; common in northeastern N. B., becoming rarer westward.

2. **F. esculentum** Moench.

Frequently planted in the Annapolis Valley; rare elsewhere and unsatisfactory because of its late seed production.

Introduced from Eu.; widespread in N. S.

38. **CHENOPODIACEAE** GOOSEFOOT FAMILY

a. Plants with wide greenish leaves.
b. Leaves thickish, fleshy; calyx or fruiting bracts not villous nor pilose; common.
c. Calyx 3-5 parted; leaves not hastate (Fig. 53, a). 1. *Chenopodium*
c. Calyx of pistillate flowers absent, the fruit enclosed by two large bracts; leaves often hastate (Fig. 53, b). 2. *Atriplex*
b. Leaves thin, green, not toothed; inflorescence much branched; calyx segments villous; rare. 3. *Axyris*
a. Plants with the leaves extremely fleshy, bract-like or absent.
d. Flowers sunken in the fleshy, watery stem; leaves absent; branches opposite; salt marshes (Fig. 54, a). 4. *Salicornia*
d. Flowers placed in the axils of the lower leaves.
e. Leaves, stem and calyx-lobes very fleshy (Fig. 54, b). 5. *Suaeda*
e. Leaves bract-like or linear, much reduced; stem and calyx-lobes not fleshy.
f. Calyx-lobes appendaged by broad membranous horizontal wings; plants coarse, stiff, much branched (Fig. 54, c). 6. *Salsola*
f. Calyx-lobes not appendaged; plants branched only at the base, the stems slender and angled. 7. *Polycnemon*

1. **CHENOPODIUM** (Tourn.)L. PIGWEED

Aellen, Paul and Theodor Just. Key and synopsis of the American species of the genus *Chenopodium*. Amer. Mid. Nat. **30**: 47-76. 1943.

a. Plants glandular, more or less aromatic; flowers pubescent.
1. *C. Botrys*

a. Plants neither glandular nor pubescent.
b. Leaves green on both sides, triangular to spatulate, often sharply toothed; glomerules of flowers almost without bracts; seeds smooth.
c. Seeds vertical or the terminal ones occasionally horizontally placed in the flowers; plant perennial; style-branches filiform; seeds almost spherical. 2. *C. Bonus-Henricus*
c. Seeds all horizontal; plant annual; style-branches short; seed flattened. 3. *C. urbicum*
b. Leaves smaller, not markedly triangular; glomerules of flowers in the axils of leafy bracts.
d. Leaves green or greenish on both sides, fleshy; seeds vertical or the terminal ones occasionally horizontal in the flowers; sepals 2-4; seed shining. 4. *C. rubrum*
d. Leaves mealy on the lower or on both sides; sepals 4-5.
e. Seeds smooth or lightly marked.
f. Leaves greenish above; seeds both horizontal and vertical, 0.6 mm in diameter; sepals not keeled. 5. *C. glaucum*
f. Leaves mealy on both sides; seeds all horizontal, 1.5 mm in diameter; sepals keeled. 6. *C. album*
e. Seeds deeply pitted, not shining, 2-2.5 mm in diameter.
7. *C. Bushianum*

1. **C. Botrys** L. JERUSALEM OAK.

The only collection seen was collected at Pictou by J. Macoun, July 25, 1883. Widely introduced from Eu.

2. **C. Bonus-Henricus** L. GOOD-KING-HENRY.

Occasional about towns; locally abundant at Annapolis and Sydney.

Introduced from Eu.; N. S., and Que. to Dela. and Iowa.

3. **C. urbicum** L.

Rare; collected by Burgess on ballast heaps at Pictou in 1883.

Adventive from Eu.; N. S. to Ont. south to Md. and Mo.

4. **C. rubrum** L. COAST BLITE.

Common on the brackish beach of Wallace Lake, Sable Is.; scattered around the mainland, often luxuriant on newly reclaimed dykelands.

N. S. to Wash. South to Me. and N. M.

5. **C. glaucum** L. OAK-LEAVED PIGWEED.

Rare; specimens from Annapolis Co., may belong here; the plant has also been collected at Summerside, P. E. I.

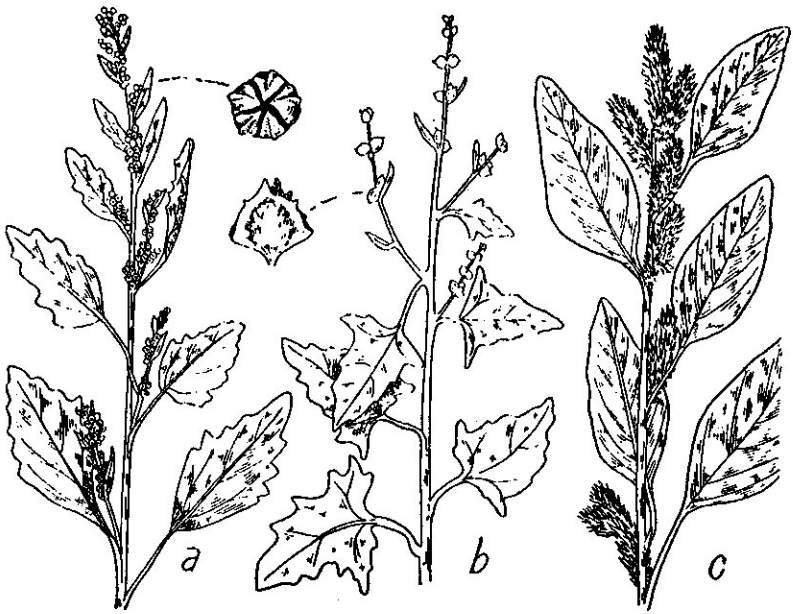


Fig. 53.—**Chenopodium.** a, **C. album,** x ½. **Atriplex.** b, **A. patula,** x ½. **Amaranthus.** c, **A. retroflexus,** x ½.

Adventive from Eu. and native; widespread, North and South America.

6. **C. album** L. LAMB'S QUARTERS, PIGWEED. Fig. 53, a.

Very common throughout; waste places, gardens, cultivated fields and roadsides; widespread in North and South America.

7. **C. Bushianum** Aellen, Fedde. Rep. Spec. Nov. **26**: 63. 1929.

Reported by Aellen from Sable Island where it is a weed at the Main Stations, one of the forms of *C. album* mentioned by St. John. Collections from Pembroke Shore, Yarmouth Co., and from Bayfield, Antigonish Co. are placed here.

N. S. and Que. to N. D. south to N. Y., N. C. and Ark.

2. ATRIPLEX (Tourn.)L. ORACH.

a. Foliage green or greenish on both sides, sparsely mealy, sometimes grayish when young.

b. Inflorescence without leafy bracts except at the base; seeds 1-2 mm wide.

c. Bracteoles surrounding the flower 1-5 mm long.

d. Leaves in part triangular-hastate or squarish, with basal angles or lobes; bracts truncate or broadly rounded at the base.
1. *A. patula* var. *hastata*

d. Leaves lanceolate or oblong to linear, not hastate; bracts mostly narrowly rounded or broadly cuneate at the base.

e. Blades of leaves lanceolate to oblong; bracteoles usually smooth on the inner face. 1. *A. patula*

e. Blades of leaves lanceolate to linear; bracteoles tubercled on the inner face. *A. patula* var. *littoralis*

c. Bracteoles up to 10-15 mm long. *A. patula* var. *bracteata*

b. Inflorescence leafy, each glomerule in the axil of a well-developed leaf; leaves small; seeds 2-4 mm wide; fruiting bracteoles 5-12 mm long. 2. *A. glabriuscula*

a. Foliage very gray or whitish, with a fine scurf on at least the lower surfaces.

f. Plant spreading or prostrate; bracteoles 6-9 mm long; leaves rhomboid-ovate; flowers in clusters of 1-6 in the axils of most leaves, not forming spikes. 3. *A. maritima*

f. Plant erect; bracteoles 4-6 or rarely to 8 mm long; flowers in axils of the leaves or in interrupted spikes. 4. *A. rosea*

1. **A. patula** L. ORACH. Fig. 53, b.

Scattered; very variable and grading into the following varieties

Var. **hastata** (L) Gray is common around the whole coast and on Sable Island, on the shoreward reaches of salt marshes, headlands beyond the reach of the waves, packed areas or newly-flooded areas on the dykelands, and the upper edges of sea-beaches. Var. **littoralis** (L) Gray is less common but grows in the same situations. Var. **bracteata** Westlund, Sveriges Atripl. 57. 1861, is an extreme variation of northern Eu. which is known in N. A. from but a single specimen collected in brackish or saline marsh near the mouth of the George R., C. B. (Fernald, 1921).

Nfld. to Ore. south to S. C. and Calif.

2. **A. glabriuscula** Edmonston, Fl. Shetl. **39**: 1845. Map 216.

Scattered around the coast; at least from Yarmouth Co. eastward, and in the Bras d'Or Lakes; sandy or gravelly shores.

Nfld. to Me. and locally to R. I.; northwestern Eu.

3. **A. maritima** E. Hallier, see Blake, Rhodora **17**: 83-86. 1915.

This west European plant is found on gravelly and sandy sea-shores from Que. to N. B., P. E. I. and the Magdalens.

It has not been reported as yet from N. S. but it is to be expected along the North Shore and the Northumberland Strait.

4. **A. rosea** L. RED SCALE.

This western species is sparingly introduced in the east. Macoun reported it from near Halifax, and plants from near Merigomish may belong here. The plant needs further investigation.

3. AXYRIS L.

1. **A. amarantoides** L. UPRIGHT AXYRIS

A single plant, roadside at Windsor, July 21, 1921, collected by Fernald, Bartram and Long (Rhodora **29** 224. 1927).

Man. to N. D. and Mo.; sparingly introduced in the East.

4. SALICORNIA (Tourn) L.

1. **S. europaea** L. GLASSWORT, SAMPHIRE. Fig. 54, a.

Common around the coast on salt marshes and tidal flats, usually occupying ground bare of other vegetation. It is one of the first pioneers on mud flats and inundated dykelands, on salt areas and around salt springs. Var. **prostrata** (Pall.) Fern. with branches numerous, and decumbent, spreading or matted, is likewise widely distributed and often conspicuous when growing with the typical upright form.

Seashores; Que. to Ga.; on saline soils inland.

5. SUAEDA Forskal. SEA BLITE.

a. Calyx lobes, at least some of them, winged or with horned appendages; spikes slender; seed 1.5-2 mm wide. 1. *S. Fernaldii*

a. Calyx lobes not appendaged nor winged, sometimes more or less hooded or keeled.

b. Plants usually erect, sometimes decumbent, more or less glaucous; sepal lobes rounded or obscurely keeled on the back; seed 2 mm wide. 2. *S. maritima*

b. Plants procumbent; seeds 1-1.5 mm wide.

c. Lower leaves 1.5 cm or less in length, dark green, not glaucous; sepals all rounded on the back. 3. *S. Richii*

c. Lower leaves 2 cm long, becoming a rich purplish-red in color; sepals or one or two of them more or less keeled on the back.
4. *S. americana*

1. **S. Fernaldii** Stanley, Field Mus. Pub. Bot. **4**: 203. 1929.

This plant was described from collections made by Fernald and Wiegand near the brackish mouth of the Salmon R., Truro. Its value or distribution elsewhere is as yet unknown.

2. **S. maritima** (L.) Dumort. SEA BLITE. Fig. 54, b.

Common around the coast on salt marshes, muddy saline shores, and around salt ponds or springs, usually associated with *Salicornia*. Older records of *S. linearis* Torr. belong here.

Anticosti to Conn. and locally to La.; Eurasia.

3. **S. Richii** Fernald, Rhodora **9**: 145. 1907.

This small, dark species of *Suaeda* is rare and not well-known. Plants from Bridgewater and other scattered places on the South Shore have been placed here, and it may possibly be more widespread.

Scattered from Nfld. along the Atlantic Coast to Me.

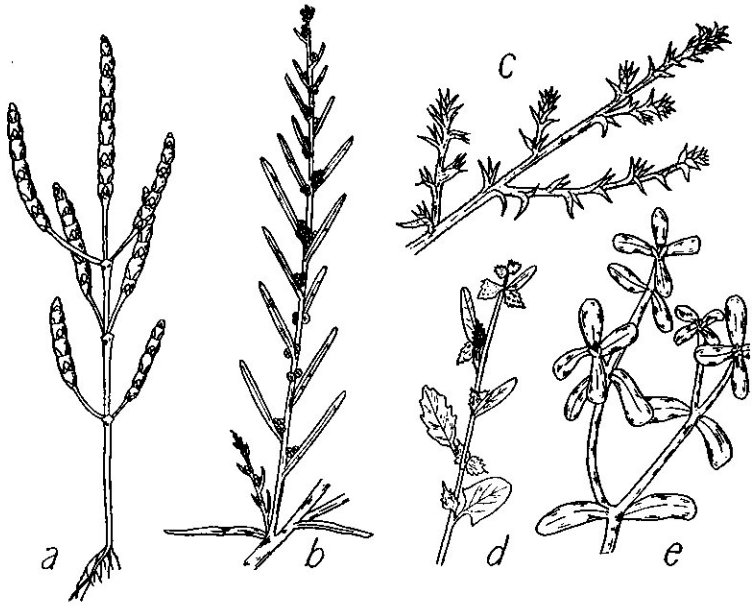


Fig. 54.—**Salicornia.** a, **S. europaea,** x ½. **Suaeda.** b, **S. maritima,** x ½. **Salsola.** c, **S. Kali,** x ½. **Atriplex.** d, **A. glabriuscula,** tip of branch, x ½. **Portulaca.** e, **P. oleracea,** x ½.

4. **S. americana** (Pers.) Fern., Rhodora **9**: 146. 1907. Map 218.

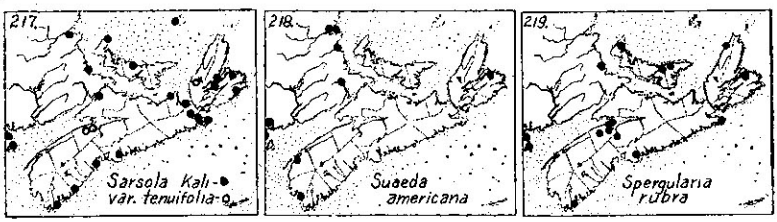
This species is the commonest one on the eastern coast of N. B. and is known at Moncton, Sydney, and at Lower Argyle, Yarmouth Co. It is rare or absent on the Fundy coast; indications are that it should be common from N. B. to Sydney; the distribution on the Atlantic Coast is unknown.

Salt marshes and sandy beaches from the lower St. Lawrence to Me.

6. SALSOLA L.

a. Plant stout and woody, nearly prostrate; leaves awl-shaped, stiff and prickly, those of the inflorescence much reduced; sea-shores.
1. *S. Kali*

a. Plant slender, much branched and erect or ascending; leaves linear, those of the inflorescence similar; waste places.
S. Kali var. *tenuifolia*



1. **S. Kali** L. COMMON SALTWORT. Map 217. Fig. 54, c.

Scattered along the sandy and gravelly seashores along the Northumberland Strait, and to C. B. Nfld. to Ga. and saline places inland.

Var. **tenuifolia** G. F. W. Mey. RUSSIAN THISTLE. This inland form of the plant is occasionally found about towns, in waste places and along railroads; found by Groh at Kentville and Port Williams, 1926 and 1930. Sandy soil, becoming introduced from western America.

7. POLYCNEMON L.

1. **P. verrucosum** Lang.

Collected by A. H. McKay near Halifax and sent to J. Macoun for identification. This specimen is in the National Herbarium at Ottawa and is dated Oct. 1896. Introduced from Eu.; no other North American record is known.

39. AMARANTHACEAE AMARANTH FAMILY

1. AMARANTHUS

a. Plants large, erect, 4-10 dm high; flowers in a large terminal inflorescence. 1. *A. retroflexus*

a. Plants prostrate to ascending, 1-4 dm long; flowers axillary. 2. *A. graecizans*

1. **A. retroflexus** L. RED-ROOT PIGWEED. Fig. 53, c.

This recently introduced garden weed is becoming common throughout in gardens, waste ground and cultivated fields and orchards. It is rapidly spreading.

Introduced from tropical America; becoming widespread.

2. **A. graecizans** L. TUMBLE WEED.

Rare, appearing only as a railroad weed; Windsor and Truro.

Western Canada to Mexico; adventive throughout the World.

ILLECEBRACEAE AND AIZOACEAE

Since the main text was written, two small plants have been noted in eastern Canada that may be found occasionally. One is **Scleranthus annuus** L., KNAWEL, a chickweed-like plant with stiff crowded linear leaves and clustered greenish flowers with minute petals or none. This is scattered in the eastern part of P. E. I. and was seen growing along roadsides in the vicinity of Montague.

The other is **Mollugo verticillata** L., CARPET WEED, also a chickweed-like plant, found growing near the railroad at Berwick by Mr. David Erskine. This is a prostrate plant with whorls of leaves and tiny whitish flowers without petals.

40. CARYOPHYLLACEAE CHICKWEED FAMILY

a. Sepals separate, more or less spreading; plants small, often prostrate; flowers less than 1 cm wide.

b. Stipules present.

c. Leaves opposite; styles 3 (Fig. 55 a). 1. *Spergularia*

c. Leaves whorled, filiform; styles 5 (Fig. 55, b). 2. *Spergula*

b. Stipules lacking.
d. Capsule splitting into valves; plant nearly smooth or with a line of hairs present on the stem.
e. Leaves linear-filiform; plants low and tufted; petals entire; styles 4 or 5 (Fig. 55, e. f). 3. *Sagina*
e. Leaves linear or broader; plants larger, styles mostly 3.
f. Petals not divided; stems wiry, round, usually erect (Fig. 55, c). 4. *Arenaria*
f. Petals 2-lobed or absent; stems softer, sometimes 4-angled, diffusely spreading. 5. *Stellaria*
d. Capsule cylindrical and curved, opening by a row of teeth at the apex; petals deeply 2-lobed; plants hairy (Fig. 55, d). 6. *Cerastium*
a. Sepals united and the calyx tubular; plants large and erect with flowers mostly over 1 cm wide.
g. Calyx without an involucre of bracts at the base.
h. Styles 3 or 5; calyx 10-nerved; flowers 2 cm wide or less.
i. Flowers solitary, rose-purple; sepals with long herbaceous tips; styles 5 opposite the petals. 7. *Agrostemma*
i. Flowers in a branching cluster; sepals with tips short, less than 2 cm long; styles alternate with the petals.
j. Styles 5; capsule with 5 two-lobed teeth; staminate, and pistillate flowers present in *L. alba*. 8. *Lychnis*
j. Styles 3; capsule 6-toothed; flowers all perfect. 9. *Silene*
h. Styles 2; calyx obscurely-nerved; flowers showy, 3 cm wide growing singly or in dense heads; capsule 4-toothed. 10. *Saponaria*
g. Calyx with an involucre of bracts surrounding the base; styles 2; pinks. 11. *Dianthus*

1. **SPERGULARIA** J. & C. Presl

Rossbach, Ruth P. *Spergularia* in North and South America. Rhodora **42**: 57-83; 105-143; 158-193; 203-213. 1940.

a. Stamens 6-10, usually 10; leaves scarcely fleshy, with long mucronate tips; stipules membranous and conspicuous, 3.5-5 mm long. 1. *S. rubra*
a. Stamens 2-5; leaves fleshy, blunt, or with a short tip; stipules 1-3.5 mm long; plants restricted to near the coast.
b. Capsule subglobose to ovoid, about twice the length of the calyx; sepals at maturity 2.2-3.2 mm long; seeds 0.8-1.4 mm long. 2. *S. canadensis*
b. Capsule equaling or a little exceeding the calyx; sepals at maturity 2.4-5 mm long; seeds 0.6-0.8 mm long. 3. *S. marina*

1. **S. rubra** (L.) J. & C. Presl. SAND SPURREY. Map 219 Fig. 55, a.

Scattered throughout in sandy or gravelly soil around towns, farmyards and waste places. June-Sept.

Nfld. to Mich. south to Md.; Vancouver Is. to Calif.; introduced from Eu.

2. **S. canadensis** (Pers.) Don. SEASIDE SAND SPURREY. Map 220.

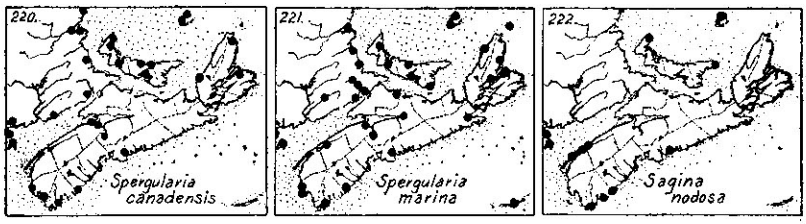
Common around the coast near the upper tide level on muddy shores, brackish marshes and on pans on the salt flats. July-Sept.

Nfld. and Que. to L. Is.; southern Alaska to B. C.

3. **S. marina** (L.)Griseb. Map 221. Fig. 55, a.

Scattered on the salt marshes and upper muddy borders of beaches around the coast, not as common as the preceeding species. [Including *S. salina* J. &. C. Presl with papillose seeds, and *S. leiosperma* (Kindberg) with smooth seeds].

Que. to Fla.; lower Calif. to B. C.; alkaline inland areas.



2. SPERGULA L.

1. **S. arvensis** L. SPURREY, PINEWEED, THOUSAND-JOINT. Fig. 55 b.

One of the commonest weeds throughout; flowers white, from early June to October.

Introduced from Eu.; throughout N. A.

3. SAGINA L.

a. Flower-parts mostly in 4's, the petals shorter than the sepals; upper leaves without reduced leaves in their axils. 1. *S. procumbens*

a. Flower-parts generally in 5's, the petals much longer than the sepals, showy; upper leaves with fasicles of reduced leaves in their axils. 2. *S. nodosa*

1. **S. procumbens** L. PEARLWORT. Fig. 55, e.

Abundant throughout; rock crevices near the coast,

damp fields, lawns and roadsides, etc.; frequent in the wet dune hollows on Sable Is. May-Oct.

Greenland to Penn., mostly near the coast; scattered inland near the Great Lakes.

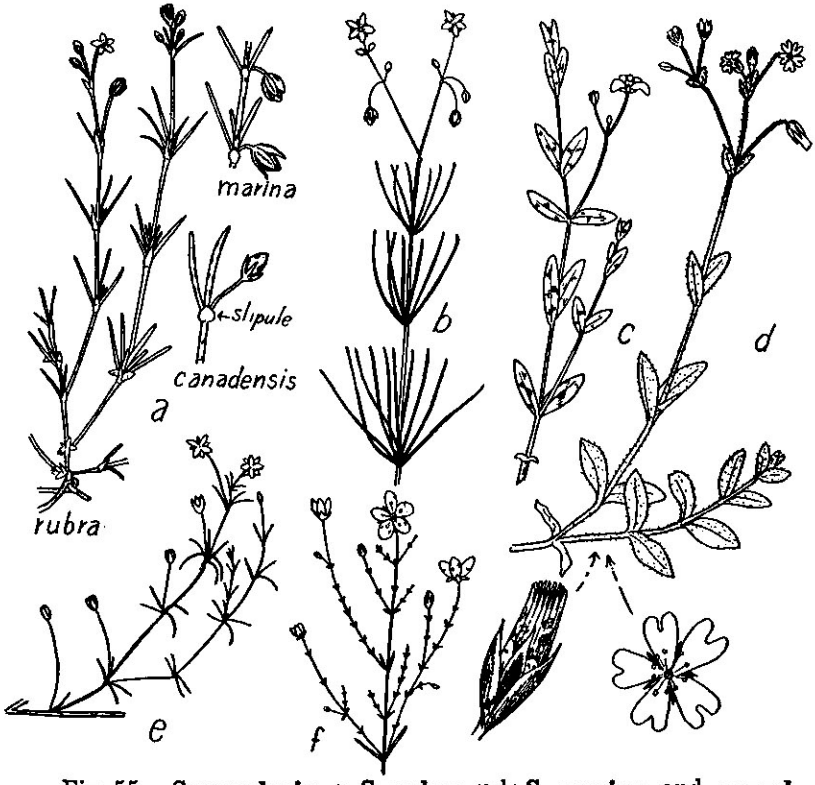


Fig. 55.—**Spergularia.** a, **S. rubra,** x ½; **S. marina** and **canadensis,** x 1. **Spergula.** b, **S. arvensis,** x ½. **Arenaria.** c, **A. lateriflora,** x ½. **Cerastium.** d, **C. vulgatum,** x ½; flower and capsule, x 2. **Sagina.** e, **S. procumbens,** x 1. f, **S. nodosa,** part of plant, x ½

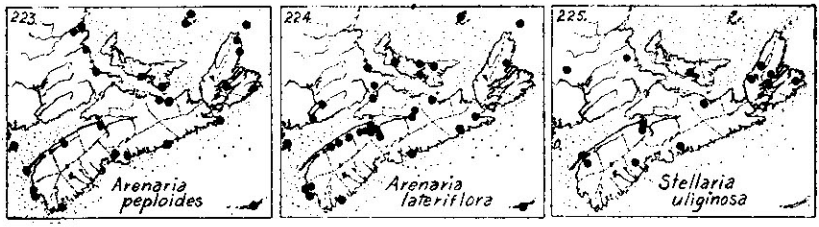
2. **S. nodosa** (L.) Fenzl., var. **pubescens** Mert. & Koch. Map 222. Fig. 55, f.

Local; sand flats of Queens and Shelburne Cos.; on the seacliffs of the Bay of Fundy from Digby Neck to north of Annapolis. This rather rare northern plant is very variable about the Maritime Provinces and the Gulf of St. Lawrence.

4. ARENARIA L.

a. Plants maritime; leaves elliptical, very fleshy. 1. *A. peploides*
a. Plants not essentially maritime; leaves not fleshy.

b. Leaves round to lanceolate in shape.
c. Leaves with blades less than 1 cm long, acute; petals shorter then the acute sepals; seeds papillose, not appendaged. 2. *A. serpyllifolia*
c. Leaves with blades 1-3.5 cm long, blunt; petals exceeding the blunt sepals; seeds smooth, appendaged at the scar or hilum. 3. *A. lateriflora*
b. Leaves linear and obtuse; petals about twice the length of the nerveless sepals. 4. *A. groenlandica*



1. **A. peploides** L., var. **robusta** Fern., Rhodora **11**: 114. 1909. SEASIDE SANDWORT. Map 223.

Sandy beaches; scattered around the whole coast. Saguenay Co., Que. to N. J. and Va.

2. **A. serpyllifolia** L. THYME-LEAVED SANDWORT.

Reported earlier from both N. S. and P. E. I., possibly erroneously. A collection from gravelly soil, Kentville, by Fernald in 1902, and labelled var. **tenuior** Mert. & Koch, is in the Gray Herbarium.

Introduced from Eurasia into most parts of N. A.

3. **A. lateriflora** L. SANDWORT. Map 224. Fig. 55, c.

Very common throughout; damp thickets, meadows, exposed headlands, etc. June-Sept.

Arctic America southward.

4. **A. groenlandica** (Retz.) Spreng. MOUNTAIN SANDWORT.

The only record of this arctic plant is from "rocks, North West Arm, Halifax." Fernald, in Rhodora 21: 20. 1919, states that this material is not exactly typical.

Lab. to the mts. of N. C.

5. STELLARIA L.

a. Leaves ovate or oblong-lanceolate.
b. Plants glabrous or nearly so.
c. Leaves 4-6 mm long, fleshy; petals equalling or exceeding the sepals; flowers axillary, 1-3. 1. *S. humifusa*

c. Leaves 10-25 mm long, thickened and veiny; flowers in short lateral scaly-bracted racemes; petals shorter than the sepals. 2. *S. uliginosa*

b. Plant with a line of hairs along one side of the stem. 3. *S. media*

a. Leaves narrow, linear or narrowly lanceolate.

d. Bracts of the inflorescence small and papery; petals longer than the sepals.

e. Leaves narrowly lanceolate, widest above the middle; stem often rough-angled; seeds smooth; inflorescence soon becoming lateral. 4. *S. longifolia*

e. Leaves wider, broadest near the base; stem smooth; seeds rough; inflorescence larger and more commonly appearing terminal. 5. *S. graminea*

d. Bracts of the inflorescence foliaceous and appearing like the upper leaves, the upper bracts often much reduced. 6. *S. calycantha*

1. **S. humifusa** Rottb.

Nichols records this as characteristic of the shoreward reaches of the salt marshes of northern C. B. It is unknown elsewhere in the province.

Greenland near the coast to Me.; northern Eu. and Asia.

2. **S. uliginosa** Murr. MARSH CHICKWEED. Map 225.

Wet sand, springy spots, margins of ponds, ditches and wet banks; common at least from Digby Co. to northern C. B., appearing at times like the preceeding species.

Widespread in the northern Hemisphere.

3. **S. media** (L.)Cyrill. COMMON CHICKWEED. Fig. 56, a.

Common throughout in moist or shady areas or near the coast.

Introduced from Eu. and widely distributed in N. A.

4. **S. longifolia** Muhl. LONG-LEAVED CHICKWEED.

Damp or wet grassy places in sandy to mucky soil; common in large areas on the meadows along the Salmon R., Truro. Both Lindsay and Macoun report this species as common, but their records are apparently based on the introduced *S. graminea.*

Nfld. to Alaska south to Md. and La.; Eu. and Asia.

5. **S. graminea** L. STITCHWORT. Fig. 56, b.

One of the commonest weeds in fields and gardens; throughout.

Introduced from Eurasia; Nfld. to Minn. south to Md. and Iowa.

6. **S. calycantha** (Ledeb.) Bongard. NORTHERN STARWORT.

Scattered in damp thickets, wet woods and ravines from the Annapolis Valley to northern C. B. Various varieties have been described, (Fernald, Rhodora **16**: 144-151. 1914), of which the commonest one in N. S., is var. **floribunda** Fern. with numerous flowers in the inflorescence. (*S. borealis* Bigel., see Fernald, Rhodora **42**: 254-259. 1940).

Nfld. to B. C. southward to N. S.

6. CERASTIUM L.

a. Petals as long or shorter than the sepals; capsules up to 10 mm long. 1. *C. vulgatum*

a. Petals 10 mm long, much longer than the sepals, showy; plants perennial. 2. *C. arvense*

Fig. 56.—**Stellaria.** a, **S. media**, x ½. b, **S. graminea**, x ½. **Lychnis.** c, **L alba**, x ½. d, **L. Flos-cuculi**, x ½. **Silene.** e, **S. Cucubalus**, x ½. **Saponaria.** f, **S. officinalis**, x ½.

1. **C. vulgatum** L., **var. hirsutum** Fries, see Fernald and Wiegand. Rhodora **22**: 169-179. 1920. MOUSE-EAR CHICKWEED. Fig. 55, d.

This is a very common weed throughout.

Throughout temperate N. A.

2. **C. arvense** L. MEADOW CHICKWEED.

Scattered and often abundant locally in fields or meadows where it has been obviously introduced; it is common at Truro, and is scattered in the Annapolis Valley. Lawson (1891) states that the true indigenous form of the plant was collected on the trap cliffs at Blomidon. This plant has not been found there recently.

This variable species and its varieties are found in the northern hemisphere around the world.

7. AGROSTEMMA L.

1. **A. Githago** L. CORN COCKLE.

Occasionally introduced into fields in grain seed; not a permanent weed, and becoming increasingly rare.

Introduced from Eu; widely spread.

8. LYCHNIS (Tourn.) L.

a. Petals divided into shallow lobes; fruiting calyx much enlarged ovoid or globose; plant sticky-pubescent.
b. Flowers red, opening in the morning; calyx-teeth triangular and acute 1. *L. dioica*
b. Flowers white or rarely pinkish, opening in the evening; calyx-teeth longer and attenuate. 2. *L. alba*
a. Petals divided into 4 linear lobes, red; fruiting calyx tubular; plant smooth. 3. *L. Flos-cuculi*

1. **L. dioica** L. RED CAMPION.

Lawson reports this plant from Annapolis and Kentville and states that it is probably a remnant of the French occupation. No recent collections have been made, and the plant may now be extinct in the province.

Introduced from Eu. and widely distributed.

2. **L. alba** Mill. WHITE CAMPION, WHITE COCKLE. Fig. 56, c.

Very common around towns, waste places, and along railroads, often becoming a bad weed.

N. S. to Mich. south to N. Y. and Penn.

3. **L. Flos-cuculi** L. RAGGED-ROBIN. Fig. 56, d.

Local; abundant in meadows in parts of Kings Co.; swale near Yarmouth; low field near Brookfield, Colchester Co. When once it is introduced into a meadow it is aggressive and persistent, but spreads very slowly to other areas. Late May.

Introduced from Eu.; N. S. to Penn.

9. SILENE L.

a. Dwarf, tufted alpine plants; flowers solitary. 1. *S. acaulis*

a. Large, erect plants; flowers several to many in each inflorescence.

b. Calyx more or less inflated, papery and obscurely-ribbed with a network of delicate veins; plant glabrous, perennial. 2. *S. Cucubalus*

b. Calyx not inflated except by the enlarging capsule; plants hairy and glandular, annuals.

c. Flowers small, in a one-sided raceme, with very short pedicels; capsule 6-8 mm long. 3. *S. gallica*

c. Flowers larger, in a terminal much-branched cluster; capsule 15-18 mm long. 4. *S. noctiflora*

1. **S. acaulis** L., var. **excapa** (All.) DC. MOSS CAMPION.

St. Paul Is.; abundant at the southwest end of the island, and also south of N. E. Channel practically at sea level (Perry, 1931). The statement is there made that this is the first record near sea-level southwest of Nfld., but Lawson (1891) says that *S. acaulis* is reported from St. Paul Is. and C. B. Is., and this record is in Macoun's Cat.

Nfld. south to N. S. and the mts. of N. H.

2. **S. Cucubalus** Wibel. BLADDER CAMPION. Fig. 56, e.

Not uncommon in fields and waste places; introduced mostly in grain seed and becoming much more widely distributed in the province, probably destined to be a common weed [*S. latifolia* (Mill.) Britt. and Rendle].

N. S. to Wash. south to N. J. and Mo.

3. **S. gallica** L.

Local; well established around Digby and Deep Brook, where it was known as early as 1902. Adventive from Eu.; local n N. A.

4. **S. noctiflora** L. NIGHT-FLOWERING CATCHFLY.

Common, at least around towns; in waste places, gardens and along roadsides; rare in the country.

Naturalized from Eu.; N. S. to Wash. south to Fla. and Mo.

10. SAPONARIA L.

a. Perennial, in large clumps; leaves tapering at the base; flowers in dense clusters, the calyx not winged. 1. *S. officinalis*

a. Annual, mostly growing singly; leaves clasping at base; flowers in a loose corymbose cyme, the calyx strongly 5-winged. 2. *S. Vaccaria*

1. **S. officinalis** L. BOUNCING BET. Fig. 56, f.

Large clumps of this garden escape may be seen along roadsides, near old houses or in waste places in most parts of the province, and especially from Digby to Pictou. It is very persistent, but not aggressively spreading. Late July-early Aug.

Throughout N. A.; introduced from Eu.

2. **S. Vaccaria** L. SOAPWORT.

Occasional; collected by Groh at Halifax, Aug. 1926; Italy Cross, Lunenburg Co., 1910.

Native of Eu.; N. S. to B. C. south to Fla.

11. DIANTHUS L. PINKS

a. Plants perennial, smooth or roughened; flowers solitary on long pedicels, with two ovate bractlets less than half as long as the calyx. 1. *D. deltoides*

a. Plants annual, more or less hairy; flowers in dense terminal clusters, subtended by numerous hairy bracts equal to the calyx in length. 2. *D. Armeria*

1. **D. deltoides** L. MAIDEN PINK.

Rare and inconspicuous; Meteghan, Digby Co. to the Annapolis Valley, where it is commonly scattered along the North Mt. slope.

Introduced from Eu.; N. S. to Mich. etc.

2. **D. Armeria** L. DEPTFORD PINK.

Scattered as a garden escape; Kentville, Wolfville, Sandy Cove, Canard, Centreville, and probably occurring elsewhere.

Introduced from Eu.; N. S. to Iowa south to Ga.

41. **PORTULACACEAE** PURSLANE FAMILY

a. Leaves wedge-shaped; garden weed; stamens 7-11; flowers yellow; seeds minute and numerous (Fig. 54, e). 1. *Portulaca*

a. Leaves not wedge-shaped; plants of native habitats; stamens 3-5; flowers not yellow; seeds 2-6.

b. Flowers minute; seeds 2-3; stems from fibrous roots; swampy places. 2. *Montia*

b. Flowers 1-2 cm wide; seeds 3-6; stems from a small deep tuber; rich woods (Fig. 58, a). 3. *Claytonia*

1. **PORTULACA** (Tourn.)L.

1. **P. oleracea** L. COMMON PURSLANE. Fig. 54, e.

Becoming common in gardens in towns; widespread in the Annapolis Valley on the lighter soils, rapidly spreading to other fields and parts of the province.

Introduced from Eu; widespread in N. A.

2. **MONTIA** (Mich.) L.

1. **M. lamprosperma** Cham., see Fernald and Wiegand, Rhodora **12**: 138-139. 1912. WATER CHICKWEED.

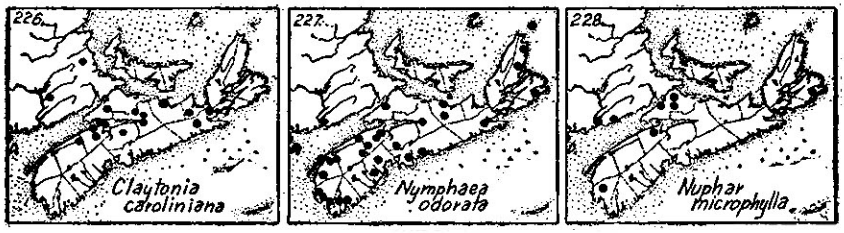
Collected on a grassy bank above the sea, Northwest Arm, Halifax, July 19, 1883 by Macoun and Burgess; also collected at Shediac, N. B. by Fowler.

Nfld. and the Gaspe to Me.

3. **CLAYTONIA** (Gronov.)L.

1. **C. caroliniana** Michx. SPRING BEAUTY. Fig. 58, a. Map 226.

Rich woods from Annapolis Co. to Amherst and northern C. B.; local in the western part of its range, general



in the Cobequids and on the hardwood hills in central and eastern N. S. May 20-June 15.

N. S. to Minn. south to Ga. and N. C.

42. CERATOPHYLLACEAE HORNWORT FAMILY

1. CERATOPHYLLUM L.

1. **C. demersum** L. HORNWORT.

Rare; found in the Canard R., Kings Co., above the tide. Common in shallow ponds in eastern P. E. I.

Slow streams and ponds across the continent.

43. NYMPHAEACEAE WATER-LILY FAMILY

a. Petiole attached at the summit of a deep notch; stem horizontal under the mud, 5 cm thick.

b. Flowers white or pinkish; leaves orbicular, with the veins mostly radiating from the summit of the petiole (Fig. 57, a). 1. *Nymphaea*

b. Flowers yellow; leaves much longer than wide, with the veins coming from the mid rib (Fig. 57, b, c). 2. *Nuphar*

a. Petiole attached to the middle of the un-notched blade, covered with gelatinous slime when young; stem slender and trailing in water; flowers small (Fig. 58, b). 3. *Brasenia*

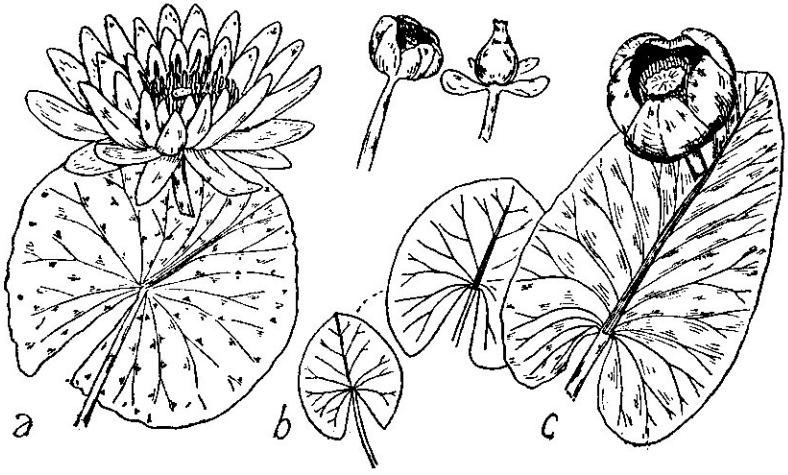


Fig. 57.—**Nymphaea.** a, **N. odorata,** x $\frac{1}{4}$. **Nuphar.** b, **N. microphyllum,** x $\frac{1}{4}$. c, **N. variegatum,** x $\frac{1}{2}$.

1. NYMPHAEA L. WATER LILY.

1. **N. odorata** Ait. WATER LILY. Map 227. Fig. 57, a.

Bog pools, lake margins and slow-flowing rivers; very common in the southern regions from Yarmouth to C. B.; rarer northwards and in the sandy areas. (*Castalia* Salisb.).

Var. **rosea** Pursh is reported common in bog-pools and lake-margins of Digby and Yarmouth Cos. (Fernald, 1921); in Halifax Co. (Rousseau, 1935); and on St. Paul Is. This variety is ill-defined, occurs when the plants are growing under dryish conditions, and has smaller and often pinkish petals.

Nfld. to Man. south to Fla. and Kans.

2. NUPHAR J. E. Smith. PONDLILY

Miller & Standley. The North American species of *Nymphaea*. Contrib. Nat. Herb. U. S. **16**: 63-108. 1912.

a. Anthers shorter than the filaments; leaf-blades to 20 cm long and 15 cm wide.
  b. Flowers 2 cm or less wide; leaf-blade 3-10 cm long, with a notch two-thirds or more the length of the midrib; young fruit without a ring of decaying stamens. 1. *N. microphyllum*
  b. Flowers 3 cm or more in width; leaf-blades 7-20 cm long, with a notch about one-half the length of the mid-rib; young fruit with a ring of decaying stamens. 2. *N. rubrodiscum*
a. Anthers equalling or longer than the filaments; leaf-blades 17-26 cm long, 11-22 cm wide, with a narrow notch more than half as long as the midrib; flowers 4.5 cm wide. 3. *N. variegatum*

1. **N. microphyllum** (Pers.) Fern. SMALL POND LILY. Map 228. Fig. 57, b.

Local; found in ox-bow ponds and sink-holes in Cumberland Co.; characteristic of ox-bow ponds in northern C. B.; scattered elsewhere (*Nymphaea microphylla* Pers.). Aug.

N. S. to Wisc. south to Penn.

2. **N. rubrodiscum** Morong. YELLOW POND LILY. Map 229.

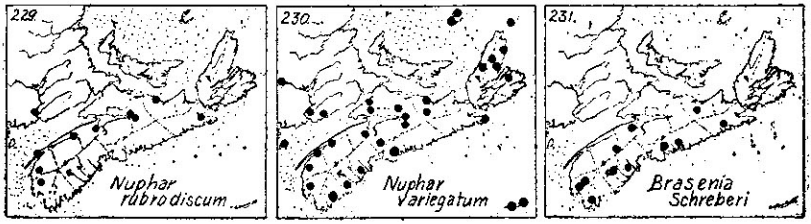
Lakes and quiet streams, Yarmouth to Pictou and Guysborough Cos., probably throughout; formerly confused with the next species, and probably a hybrid between it and *N. microphyllum* [*Nymphaea rubrodisca* (Morong) Greene].

N. S. to Minn. south to Penn.

3. **N. variegatum** Engelm. COW LILY. Map 230. Fig. 57, c.

Common throughout; also on Sable Is.; lakes, ponds, quiet streams and still-waters. All early records of *N. advena* Ait. for N. S. belong here.

N. S. to Minn. south to N. J., Ohio and Nebr.



3. **BRASENIA** Schreb.

1. B. Schreberi Gmel. WATER SHIELD. Map 231. Fig. 58, b.

Local; in various lakes of Yarmouth and Shelburne Cos. (Fernald, 1921, 1922); scattered in lakes in Halifax Co. (Lawson, 1891); and reported from various places east to Guysborough Co. (Rousseau, 1935), and Millstream Pictou Co. (Robinson, 1906).

N. S. to Man. south to Fla., Tex. and Nebr.

44. **RANUNULACEAE**. BUTTERCUP FAMILY.

a. Plant a vine, climbing by the bending of the petioles; leaflets 3; flowers in panicles (Fig. 60, a). 5. *Clematis*

a. Plants herbaceous, not climbing.

b. Leaves reniform or orbicular, toothed or very shallowly lobed.

c. Leaves mostly basal, 0.5-5 cm wide; fruit achenes; buttercups. 1. *Ranunculus*

c. Leaves scattered along the stem, reniform, 2-20 cm wide; fruits of many-seeded follicles (Fig. 60, d). 6. *Caltha*

b. Leaves deeply lobed or compound.

d. Leaves all basal; plant less than 10 cm high.

e. Leaves with 3 lobes cut half or two-thirds to the base; flowers blue, subtended by tiny leafy bracts (Fig. 59, d). 3. *Hepatica*

e. Leaves with 3 toothed leaflets; flowers white, without leafy bracts; rootstocks bright-yellow (Fig. 60, c). 7. *Coptis*

d. Leaves both basal and scattered on the stem, or all scattered.

f. Stem leaves 2 or 3, opposite or whorled. 4. *Anemone*

f. Stem-leaves alternate, often reduced in size.

g. Leaves deeply cut, or palmately-compound, but once divided. 1. *Ranunculus*

g. Leaves large, ternate, with 3 large leaflets once or twice divided.
h. Plant 10-25 dm high; leaves numerous, sessile or nearly so, the final divisions with 3-5 teeth at the apex; fruit achenes. 2. *Thalictrum*
h. Plant less than 10 dm high; leaves few on the stem, long-petiolate.
i. Leaves 1-2, on the stem only, much-divided with the lobes sharply and acuminately pointed; fruit a berry; flowers small, not spurred, in short racemes. 9. *Actaea*
i. Leaves mostly basal, the stem ones reduced, the ultimate divisions with rounded teeth or lobes; fruit a follicle; flowers large, few, the petals spurred. 8. *Aquilegia*

1. **RANUNCULUS** (Tourn.)L. BUTTERCUP

Benson, L. North American *Ranunculi*. Bull. Torrey Bot. Club **68**: 156-172; 477-490; 640-659. **69**: 296-316; 373-386. 1940-1941. Drew, W. B. The North American representatives of *Ranunculus*, sect. *Batrachium*. Rhodora **38**: 1-47. 1936.

a. Leaves finely cut into thread-like or capillary divisions; plant aquatic or sometimes stranded; flowers white; achenes wrinkled (Fig. 58, c).
b. Receptacle densely hairy, the hairs more or less tufted; achenes 1-1.5 mm long, sometimes hairy. 1. *R. aquatilis* var. *capillaceus*
b. Receptacle smooth or sparsely hairy, the hairs not tufted; achenes 1.5-1.8 mm long, usually smooth. *R. aqualitis* var. *calvescens*
a. Leaves entire, or divided with flattened lobes; flowers yellowish; achenes not wrinkled.
c. Plants of brackish soil, small, scapose, spreading by runners; achenes striate; leaves fleshy, merely toothed, rectangular to reniform; fruiting axis very elongate (Fig. 58, d). 2. *R. Cymbalaria*
c. Plants not in brackish locations; achenes smooth.
d. Leaves linear to broadly lanceolate, entire or nearly so; plant rooting at the nodes, sub-aquatic.
e. Leaves 5-10 mm wide; petals 4-8 mm long; stamens 25-50; achenes 20-50. 3. *R. Flammula*
e. Leaves filiform, 0.5-1.5 mm wide; petals 2-4, rarely to 7 mm long; stamens 5-25; achenes 5-15 (Fig. 58, f). *R. Flammula* var. *filiformis*
d. Leaves orbicular to elliptical, crenate or cut into numerous lobes.
f. Plants weak and slender, aquatic or on wet mud; leaves orbicular and radially cut into numerous segments; flowers about 1 cm wide, the petals slightly exceeding the sepals (Fig. 58, e). 4. *R. Gmelinii*
f. Plants vigorous, erect or creeping, the leaves not floating, irregularly divided and lobed, or orbicular and merely crenate.

g. Leaves orbicular to reniform, crenate, the lower ones occasionally 3-lobed; erect plants on rich soils (Fig. 59, a). 5. *R. abortivus*

g. Leaves irregularly and much divided.

h. Plants bristly or hirsute with stout spreading hairs; plants erect; flowers inconspicuous, the petals about 4 mm long or less.

i. Styles hooked in fruit; heads sub-globose; leaf divisions sessile; petals nearly equalling the sepals (Fig. 59, b). 6. *R. recurvatus*

i. Styles straight or nearly so; heads about 3 times as long as wide; petals half as long as the sepals; terminal divisions of the leaf stalked. 7. *R. pensylvanicus*

h. Plants smooth or with light, soft pubescence; flowers showy, the petals to 10 mm long.

j. Base of plant thickened, bulbous; leaves with the lateral divisions sessile, the terminal one stalked. 8. *R. bulbosus*

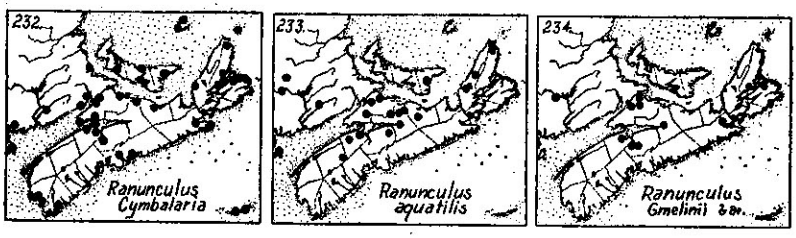
j. Base of the plant not bulbous.

k. Plants erect; style more than 1 mm long; divisions of the leaf all sessile (Fig. 59). 9. *R. acris*

k. Plant usually rooting at the lower nodes, or creeping; style less than 1 mm long; divisions of the leaf stalked, the stalks of different texture than the blade; flowers larger, more orange in color. 10. *R. repens*

1. **R. aquatilis**, var. **capillaceus** DC. WHITE WATER CROWFOOT. Map 233. Fig. 58, c.

Slow-moving streams, lagoons, shallow pools and occasionally in ditches in meadows, associated with mucky soils; scattered from Annapolis to C. B. (*R. trichophyllus* Chaix.) July-Aug. Lab. to Alaska south to N. Y., & Calif.; Eurasia.



Var. **calvescens** (W. Drew)L. Benson, Bull Torry Bot. Club **89**: 381-384. 1942, is rarer than the above variety. Certain collections from near Truro seem to be near to *R. subrigidus* Drew, Rhodora **38**: 39. 1936, since they have short petioles and the leaf-divisions are stout and rigid. Benson considers this species to be merely plants intermed-

iate between *R. aquatilis* and *R. circinatus* of Que. and New England westward. The N. S. plants may then be considered as extremes of the above variety only.

N. S. to N. England & N. Y. west to Keneewaw Co., Mich.

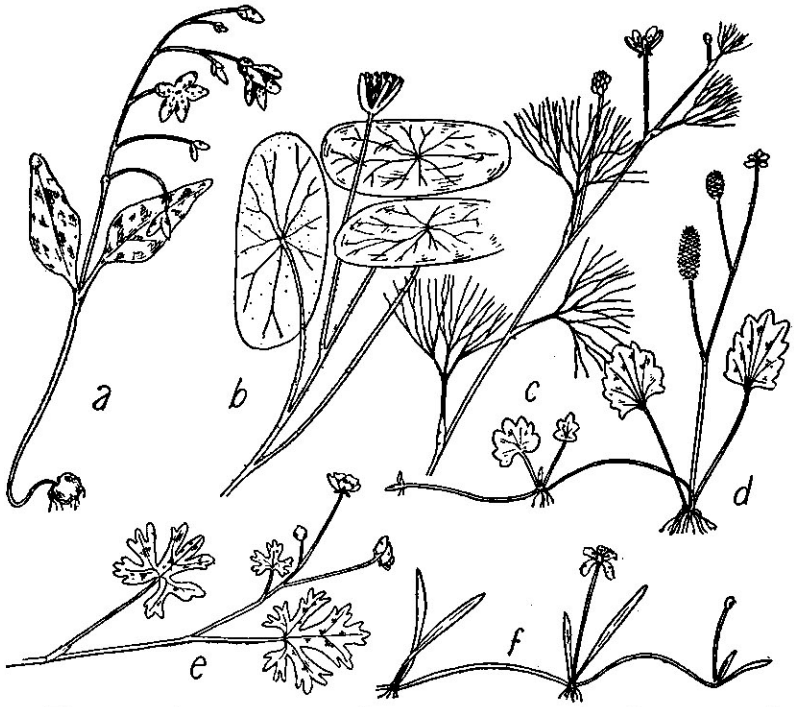


Fig. 58.—**Claytonia.** a, **C. caroliniana,** x ½. **Brasenia.** b, **B. Schreberi,** x ½. **Ranunculus,** all x ½. c, **R. aquatilis.** d, **R. Cymbalaria.** e, **R. Gmelinii.** f, **R. Flammula** var. **filiformis.**

2. **R. Cymbalaria** Pursh. SEA-SIDE BUTTERCUP. Map 232. Fig. 58, d.

Characteristic of salt marshes and flooded dyke lands throughout; found only near or on saline soil. July-Aug. Lab. south along the coast of N. J.; scattered inland.

Var. **alpina** Hook is a smaller plant with the leaves more rectangular, 4-10 mm long, 2.5-6 mm wide, and 3-toothed at the apex; stamens about 10; achenes 25-60; and the sepals 2-3 mm long. This arctic variety growing from Siberia to Alaska and Nfld. is not well-marked in N. S. but intermediates occur on Sable Is. and from Que. to Nfld.

3. **R. Flammula** L.

Known in the province by but one collection; from a cold spring brook, Tusket, Yarmouth Co. (Fernald, 1921)

The statement by Nichols (1918) that it is characteristic of sandy shores in C. B. must refer to the following variety. Eu.; Nfld., N. S. and Wash. and Ore.

Var. **filiformis** (Michx.) Hook., see Benson,l. c., SMALL SPEARWORT. Fig. 58, f.

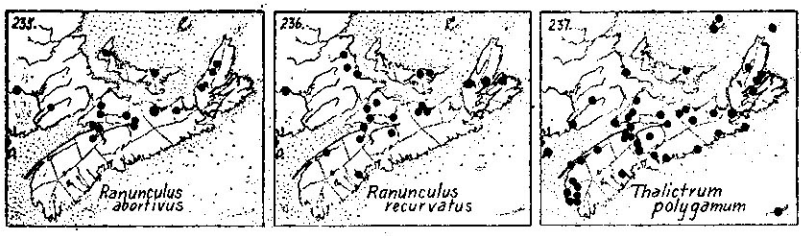
Along rivers, sandy beaches, rocky shores, and swampy edges of rivers and lakes; scattered throughout but commonest from Annapolis and Cumberland Cos. to C. B. The exact identification of the various forms of *R. Flammula* is rather arbitrary. On the West Coast it grades into a smaller, wider-leaved extreme called var. *ovalis* (Bigel.) Benson, which in turn grades into var. *filiformis.* Some of the leaves in some plants in N. S., have the wider width and flat shape so that these plants might almost as well be placed in the var. *ovalis.* (*R. reptans L*). July-Sept.

Eurasia; Alaska to Greenland south to Minn. and Penn.

4. **R. Gmelinii** DC., var. **terrestris** (Ledeb.) L. Benson, Bull. Torrey Bot. Club **69**: 613. 1942. Map 234. Fig. 58, e.

Common in marshes at Kentville, Windsor and Truro and from there to Amherst and northern C. B.; generally growing in shallow water among the bases of swamp plants, occasionally seen in deeper water in slow-moving brooks or sometimes out on sandy shores or dried-up ditches.
(R. *Purshii* Richards).

N. S. and P. E. I., to Alaska south to Me., Mich. & N. M.



5. **R. abortivus** L., var. **acrolasius** Fern., see Fassett, Mass Collections: *Ranunculus abortivus* and its close relatives. Amer. Midl. Nat. **27**: 512-522. 1942. Map 235. Fig. 59, a. WOOD BUTTERCUP.

Common on rich wooded hillsides and along river intervales from Annapolis Co. to C. B. Macoun records these plants as var. *micranthus.* Var. **eucyclus** Fern. with leaves

orbicular and with a closed or over-lapping sinus, is merely an ecological form in rich locations. This is occasionally seen along the intervales. Diminutive plants bloom in early May. May-June.

Lab. to Alaska south to Conn., Minn. & Colo.

6. **R. recurvatus** Poir. Map 236. Fig. 59, b.

Rich woods along intervales, and seepy hillsides; Annapolis Co., to northern C. B.

Nfld. to Minn. south to Ga. & Okla.

7. **R. pensylvanicus** L. f. BRISTLY CROWFOOT.

Lindsay lists this species from Pictou, collected by A. H. McKay. A specimen was seen from Cumberland Co.

Nfld. to Alaska south to N. S.; in the Rockies to N. M.; and in China.

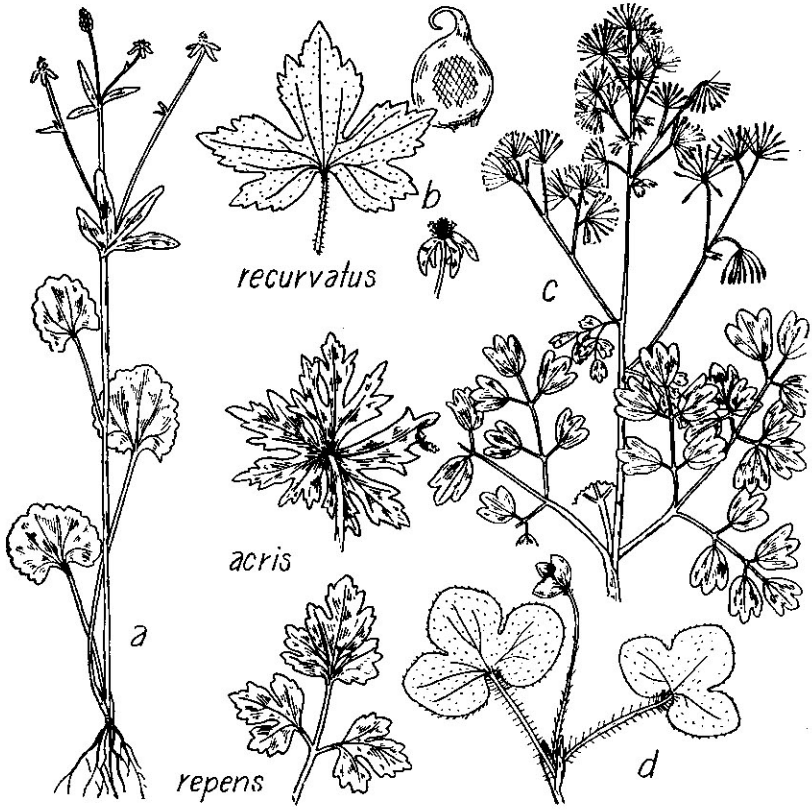


Fig. 59.—**Ranunculus.** a, **R. abortivus,** x ½. b, **R. recurvatus.** eaf, x ½; flower, x 2; achene, x 5. **Thalictrum.** c, **T. polygamum,** x ½. **Hepatica.** d, **H. americana,** x 1/3.

8. **R. bulbosus** L. BULBOUS CROWFOOT.

Common from Barrington to Shelburne; scattered along the South Shore in light soils from Yarmouth to east of Bridgewater; Lawson (1891) reports it as perfectly naturalized in Point Pleasant Park, Halifax; Windsor.

Introduced from Eu.; dry fields and roadsides, Nfld. to B. C., southward.

9. **R. acris** L. FALL FIELD BUTTERCUP. Fig. 59.

Common throughout; fields, meadows and roadsides, chiefly in heavy or moist soils, often a bad weed in low ground. Var. *Steveni* (Andrz.) Lange has less dissected leaves with broadly oblanceolate or cuneate segments. This has a wide range but intergrades so much that it hardly seems desirable to keep it separate. June 15-July.

Introduced from Eu.; Lab. to N. C. and scattered westward.

10. **R. repens** L. CREEPING BUTTERCUP. Fig. 59.

Common throughout in ditches, low ground, meadows, wet woods and elsewhere. It is very variable, and on dry ground often pubescent. Var. **villosus** Lamotte has the pubescence wide-spreading. Var. **erectus** DC., without trailing branches, is found occasionally in Que. and Nfld. A collection from shallow pools in hardwoods at Pleasant Bay, C. B. may belong here. June 20-Aug.

Nfld. & Que. to N. C.; Alaska to Calif., Colo. & Idaho.

2. **THALICTRUM** (Tourn.)L. MEADOW RUE.

1. **T. polygamum** Muhl., MEADOW RUE. Fig. 59, c. Map 237.

Common throughout in marshes, meadows, ditches and thickets, or even in the climax forest along the flood plains.

Var. **hebecarpum** Fern. has the leaves usually pubescent beneath and the achenes pubescent, plant more robust, and the inflorescence subcorymbose instead of paniculate. This is often abundant and grades into the species in all parts of the province. It is the only form present on Sable Is. (T. Zibellium). July-Aug.

Nfld. to Sask. southward.

3. **HEPATICA** (Rupp.) Mill.

1. **H. americana** (DC.) Ker., see Fernald, Rhodora **19**: 45-46. 1917. Fig. 59, d. HEPATICA.

Rare and very local; Bridgewater, Windsor, Pictou, Stewiacke and Antigonish. Earlier records list it from various intermediate locations. Early May. (The American variant of *H. triloba* Chaix.).

N. S. to Man. & Minn. south to Fla. & Mo.

4. **ANEMONE** (Tourn.) L.

a. Plants 3-12 dm high, stout, generally branched, bearing several flowers. 1. *A. virginiana*

a. Plants 1-2 dm high, slender, generally unbranched, bearing only one flower. 2. *A. quinquefolia*

1. **A. virginiana** L. FALL ANEMONE.

Rare, restricted to intervales or banks of rivers; occasional in Colchester and Pictou Cos.; scattered on some of the intervals of northern C. B. (Nichols, 1918).

N. S. to Minn. south to Ga. & Ark.

2. **A. quinquefolia** L. WOOD ANEMONE.

Scattered to rare; north of Bridgetown, Annapolis Co.; Newport, Hants Co.; Middle Stewiacke; and rather common along the St. Andrew's R., Stewiacke and back of Shubenacadie. Mid-June.

N. S. to Minn. south to Ohio & Iowa.

5. **CLEMATIS** L.

1. **C. virginiana** L. VIRGIN'S BOWER. Map 238. Fig. 60, a.

Scattered throughout, commonest in the north-central counties; banks of streams, stony banks, ravines and climbing over bushes of roadside thickets. It is one of the char-

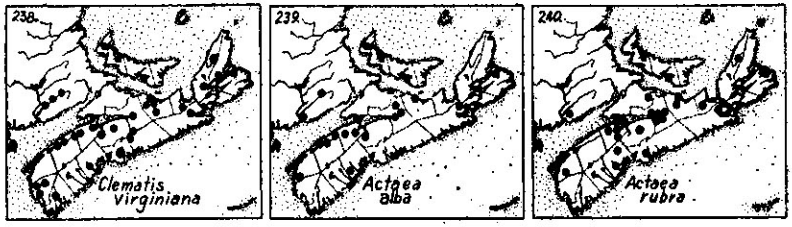


Fig. 60.—**Clematis.** a, **C. virginiana,** x ½; achenes, x 1. **Aquilegia.** b, flower, x ½. **Coptis.** c, fruiting plant and flower, x ½. **Caltha,** d, **C. palustris,** x 1/3. **Actaea.** e, **A. pachypoda,** fruiting raceme, x ⅓. f, **A. rubra** plant and fruiting raceme, x ½.

acteristic intervale plants in eastern N. S.; characteristic of the higher parts of the flood plains in northern C. B. Aug. 1-Aug. 15.

N. S., to Man., south to Ga. and La.

6. **CALTHA** (Rupp.) L.

1. **C. palustris** L. MARSH MARIGOLD. Fig. 60, d.

Collected at Whycocomagh by Macoun in 1883. Although Lindsay lists it from Mahone Bay, it is known for certainty only from northern C. B. where it is found on the margin of slow streams, on marshes and beside pools. The plant is very abundant and luxuriant on the marshes between Margaree Forks and Margaree Harbour. It is common and widespread in eastern P. E. I. May-June.

Lab. to Sask. south to S. C.

7. **COPTIS** Salisb.

1. **C. groenlandica** (Oeder)Fern., Rhodora **31**: 142. 1929. GOLDTHREAD. Fig. 60, c.

Common throughout; coniferous forests, swamps, bogs, roadside banks, etc. One colony of plants growing in a spruce woods at Bay St. Lawrence was found to have the leaflets finely dissected. May.

Lab. to Alaska south to Md. and in the mts. to Ga.

8. **AQUILEGIA** (Tourn.) L.

1. **A. vulgaris** L. GARDEN COLUMBINE. Fig. 60, b.

A garden escape established in many parts of the province where it has spread to roadsides, fields and damp hollows.

Introduced from Eu.; and widely established.

9. **ACTAEA** L.

a. Leaves glabrous beneath except for a few hairs on the veins; fruit white, the pedicels stout and thickened, 3-10 mm long. 1. *A. pachypoda*

a. Leaves mostly pubescent over the whole surface, occasionally as above; fruit mostly red, the pedicels slender, 8-15 mm long. 2. *A. rubra*

1. **A. pachypoda** Ell., see Fernald, Rhodora **42**: 260-266 1940. WHITE BANEBERRY. Map 239. Fig. 60, e.

Characteristic o. hardwood climax forests and intervales, rocky or open woodlands, around the edges of fields, generally in loamy or somewhat light soils; Annapolis to northern C. B., scattered to very rare elsewhere [A. *alba*(L.) Mill. of other authors]. Late May-early June.

N. S. to Minn. south to Ga. & Mo.

2. **A. rubra** (Ait.) Willd. RED BANEBERRY. Map 240. Fig. 60, f.

In similar situations to the last, although perhaps more restricted to the richer soils and intervales; characteristic of hardwood forests and commonest from Annapolis to northern C. B. May 15-May 30. Forma **neglecta** (Gillman) Robinson has pure white berries. This is common on many of the intervales in Colchester and Kings Cos.

Lab. to S. Dak. south to N. J. & Nebr.

45. BERBERIDACEAE. BARBERRY FAMILY.

a. Plants herbaceous; berries blue. 1. *Caulophyllum*
a. Plants shrubby; berries red. 2. *Berberis*

1. CAULOPHYLLUM Michx.

1. **C. thalictroides** (L)Michx. BLUE COHOSH.

Rare, known from but one place; half a dozen plants exist on the intervale under sugar maple trees at Kemptown, Colchester Co. Early June.

N. S.; N. B. to Man. south to S. C.

2. BERBERIS (Tourn) L. BARBERRY

a. Leaves with a smooth edge; thorns mostly solitary; berries in clusters like gooseberries. 1. *B Thunbergii*
a. Leaves with a spiny-toothed edge; thorns mostly in 3's; berries in hanging racemes like currents. 2. *B. vulgaris*

1. **B. Thunbergii** DC. JAPANESE BARBERRY.

Commonly planted as an ornamental shrub; occasionally found as an escape or waif. Native of Japan; widely spread.

2. **B. vulgaris** L. COMMON BARBERRY. Fig. 61, a.

Formerly much planted as an ornamental around driveways and buildings. Scattered bushes still persist, and occasional escapes may be found. This shrub is the alternate host of the black stem rust of cereals and should be exterminated when found. Similar rust-resistant species are now being planted.

Native of Eu.; widely introduced.

46. PAPERAVACEAE POPPY FAMILY

a. Perennial, stemless; juice red; leaves large and palmately lobed; petals 4-12, white (Fig. 61, b). 1. *Sanguinaria*
a. Biennial, tall and branched; juice orange; leaves coarsely pinnatified; petals 4, yellow (Fig. 61, c). 2. *Chelidonium*
a. Annual, low; juice whitish; leaves pinnately-lobed; petals, 4, large reddish to scarlet. 3. *Papaver*

1. SANGUINARIA (Dill.) L.

1. **S. canadensis** L. BLOODROOT. Fig. 61, b.

Low ground near streams and in rich intervales, often

just above tide level; Hants Co., rare; Colchester Co., common around Truro and along many of the streams and rivers; scattered elsewhere from Cumberland Co. to northern C. B. This plant is variable, and several dubious varieties have been proposed. Early May.

N. S. to Man. south to Fla.

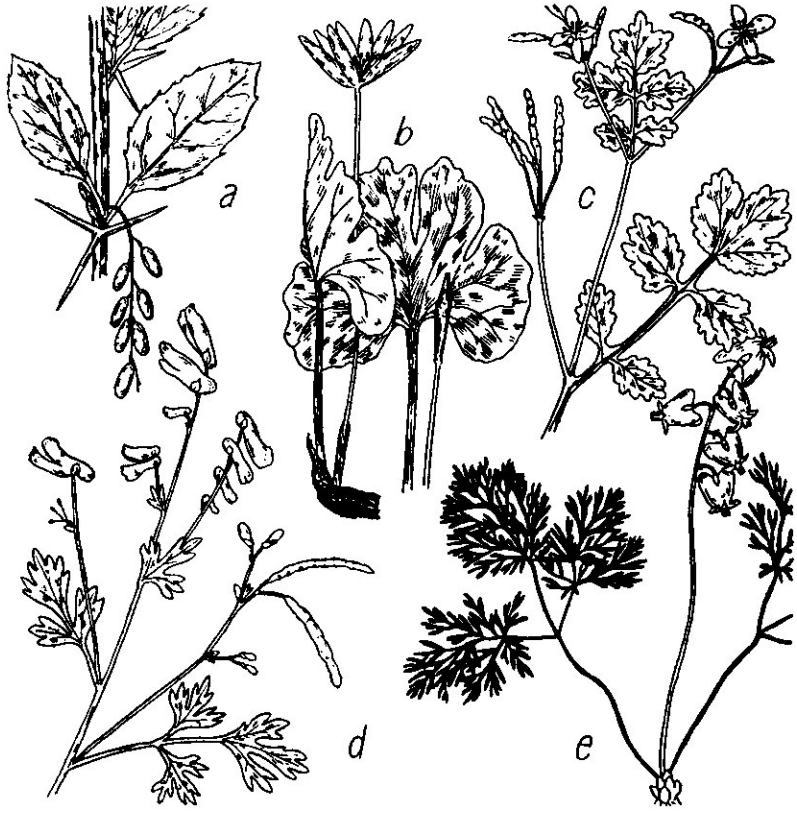


Fig. 61.—**Berberis.** a, **B. vulgaris,** x ½. **Sanguinaria.** b, flowering plant, x 1/3. **Chelidonium.** c, top of plant, x ½. **Corydalis.** d, part of plant, x ½. **Dicentra.** e, **D. Cucullaria,** x 1/3.

2. **CHELIDONIUM** (Tourn.) L.

1. **C. majus** L. CELANDINE. Fig. 61, c.

Becoming rather common about towns and villages in southern Digby, Yarmouth and Shelburne Cos. June-Aug.

Introduced from Eu.; N. S. to Ont. south to N. C.

3. **PAPAVER** (Tourn.) L. POPPY.

a. Leaves deeply toothed to lobed, tapering to the base; peduncle bristly hairy, at least below. 1. *P. Rhoeas*

a. Leaves merely toothed, rounded at the base and prominently clasping; peduncle smooth or with but a few scattered hairs. 2. *P. somniferum*

1. **P. Rhoeas** L. CORN POPPY.

Occasional on rubbish dumps, rarely as an escape in fields. Collected by H. Groh from Amherst, Pictou and Sydney; reported by others from near different ports in the northern counties. July-Aug.

Introduced from Eu. and widely distributed.

2. **P. somniferum** L. POPPY.

Occasional on rubbish dumps and in waste places; Sydney, Bridgewater and Yarmouth.

Native of the Mediterranean Region; an ornamental flower.

47. **FUMARIACEAE**. FUMITORY FAMILY.

a. Corolla with the two opposite petals spurred at the base; fruit several seeded.

b. Plant climbing; petals firmly united and the corolla spongy; seeds not crested. 1. *Adlumia*

b. Plant low, erect and scapose; petals slightly united, not spongy; seeds crested (Fig. 61, e). 2. *Dicentra*

a. Corolla with but one of the petals spurred at the base.

c. Fruit oblong, several-seeded; flowers purplish-green or rose colored with yellowish tips, 10-15 mm long (Fig. 61, d). 3. *Corydalis*

c. Fruit round, 1-seeded; flowers deep purple, tipped with crimson, 5-7 mm long. 4. *Fumaria*

1. **ADLUMIA** Raf.

1. **A. fungosa** (Ait.) Greene. CLIMBING FUMITORY.

Formerly planted about gardens and grounds where it may be very persistent, with the seeds retaining their vitality for years; rare, and much less commonly planted than formerly.

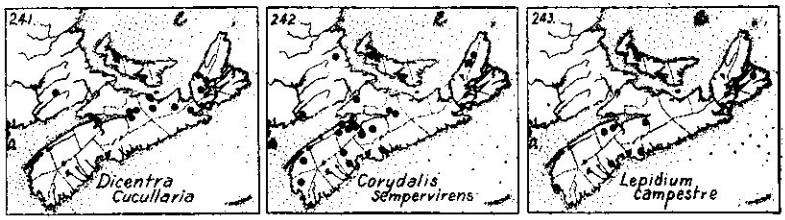
Eastern Que. to Wisc. south to N. C.

2. **DICENTRA** Bernh.

1. **D. Cucullaria** (L) Bernh. DUTCHMAN'S BREECHES. Fig. 61, e. Map 241.

Rich woods, intervales and hardwood hillsides; Cape Blomidon; common in the Cobequid and east to northern C. B. where it is restricted to the intervales. It is best developed on the intervales and hardwood slopes around Truro and central Pictou Co. The plant in Lindsay's herbarium labelled *D. canadensis* from Truro is this species. May 20-June 10.

N. S. to Minn., Ga., & Mo.



3. **CORYDALIS** (Dill.) Medic.

1. **C. sempervirens** (L.) Pers. PINK CORYDALIS. Map 242. Fig. 61, d.

Scattered throughout; rocky places where leaf mould has washed into hollows and pockets; most noticeable the first year on newly-burnt land, where it grows from seeds that have lain dormant. (*C. glauca* Pursh). June-Sept.

Nfld. to Alaska south to Ga., Minn. & Mont.

4. **FUMARIA** (Tourn.) L.

a. Flowers 4-6 mm long; fruit without a sharp point; leaf-segments flat and not channelled. 1. *F. officinalis*

a. Flowers 4 mm long or less; fruit with a sharp point; leaf-segments very narrow and channelled. 2. *F. parviflora*

1. **F. officinalis** L. COMMON FUMITORY.

Rare; occasionally about old gardens where it is cultivated or is persisting. Lawson (1891) records it as sparingly spontaneous in gardens at Halifax. Specimens have been seen from Kentville, Windsor, and Sydney. July-Aug.

Introduced from Eu.; scattered and widespread.

2. **F. parviflora** Lam.

Sparingly introduced around some of the seaports of the New World (Lawson, 1891); Macoun records it from waste heaps at Bedford, Pictou and North Sydney. No specimens were seen.

48. **CRUCIFERAE** MUSTARD FAMILY

a. Flowers white, creamy-white, greenish or purple.
b. Fruit transversely divided into two cells; plants fleshy, found only on sea-shores (Fig. 63, e). 10. *Cakile*
b. Fruit longitudinally divided into two cells.
c. Fruit short, less than 3.5 times as long as wide.
d. Fruit flattened parallel to the partition.
e. Plant much branched; leaves entire, stem and pods whitish-hairy. 2. *Berteroa*
e. Plant low and unbranched; leaves toothed; stems and pods green, almost smooth. 1. *Draba*
d. Fruit flattened at right-angles to the narrow partition or nearly round.
f. Leaves deeply and irregularly pinnately-lobed.
g. Fruit wedge- or purse-shaped (Fig. 62, c). 7. *Capsella*
g. Fruit like two nutlets placed side by side (Fig. 62, e). 5. *Coronopus*
f. Leaves entire or merely toothed.
h. Fruit round in outline, flat, often with a margin extending at the tip.
i. Fruit 10-12 mm wide; plant slightly or not branched (Fig. 62, a.) 3. *Thlaspi*
i. Fruit 2-4 mm wide; plant generally much branched at the apex (Fig. 62, b). 4 *Lepidium*
h. Fruit orbicular or oblong-cylindrical.
j. Fruits perfectly orbicular; leaves widely clasping at the base (Fig. 62, d). 9. *Neslia*
j. Fruits oval or oblong; leaves linear or wider, not clasping at the base.
k. Plants found on sandy or gravelly lake-bottoms, 2-8 cm high; leaves basal and thread-like (Fig. 63, a). 6. *Subularia*
k. Plants growing on dry land; leaves flat or lobed.
l. Leaves clasping, not toothed. 8. *Camelina*
l. Leaves not clasping, toothed, 15-30 cm long at the base of the plant. 20. *Armoracia*
c. Fruits 4 to many times as long a wide.
m. Stem-leaves 2, opposite, each with 3 leaflets; woodland plants. (Fig. 65, b). 23. *Dentaria*

m. Stem-leaves many, entire or pinnately-cleft.
n. Petals 15-20 mm long, purplish or rarely white; leaves not divided, 8-13 cm long; seeds in one row in each cell. 16. *Hesperis*

n. Petals very small, or if 12 mm long then the leaves pinnately-compound.
o. Leaves lanceolate, finely toothed or entire. 25. *Arabis*

o. Leaves all finely pinnately-lobed.
p. Stems erect, unbranched or branched only near the top, the leaves chiefly basal; pods straight, flattened, the seeds in 1 row in each side or cell (Fig. 64, e; 65, a). 24. *Cardamine*

p. Stems often floating on or in water, much branched, leafy; pods curved and terete; seeds in 2 rows in each cell (Fig. 63, f). 18. *Nasturtium*

a. Flowers yellow or creamy-yellow.
q. Fruit not more than 3 times as long as wide, or less than 6 mm long.
Leaves not toothed, usually clasping.
Fruit globose, roughened (Fig. 62, d). 9. *Neslia*

Fruit ovate, smooth. 8. *Camelina*

Leaves pinnately lobed or finely divided.
Fruit oblong, the surface smooth; leaves with wide lobes; common weeds (Fig. 65, c). 19. *Rorippa*

Fruit like two nutlets side by side, the surface rough; leaves finely divided; rare (Fig. 62, e). 5. *Coronopus*

q. Fruit 4 to many times as long as wide.
r. Fruit not opening, the wall fleshy and becoming hard, formed of many 1-seeded sections; sepals erect and appressed to the petals (Fig. 63, d). 11. *Raphanus*

r. Fruit splitting when ripe into 2 longitudinal halves.
s. Seeds in two rows in each side or cell: rare. 13. *Diplotaxis*

s. Seeds in one row in each cell.
t. Leaves pinnate, or more or less pinnately-lobed.
u. Flowering racemes with leafy bracts. 21. *Erucastrum*

u. Flowering racemes without bracts.
v. Fruits closely appressed to the stem; flowers 3 mm wide (Fig. 64, a). 15. *Sisymbrium*

v. Fruits not closely appressed, or if appearing so then with the flowers much larger.

w. Fruits extremely long and slender, not thicker than their pedicels (Fig. 64, b). 15. *Sisymbrium*

w. Fruits wider than the diameter of the pedicels.
x. Leaves extremely finely divided; pods long, slender and curved. 15. *Sisymbrium*

x. Leaves widely lobed or pinnate.
y. Leaves very glossy and smooth above with mostly rounded lobes; flowering May and early June; beak of fruit less than 4 mm long (Fig. 64, d). 22. *Barbarea*
y. Leaves thin, often hairy, with toothed lobes; flowering later; beak end of the fruit mostly more than 4 mm long; sepals spreading in flower (Fig. 63, c). 12. *Brassica*
t. Leaves entire or merely toothed.
z. Leaves smooth and sagittate at the base. 14. *Conringia*
z. Leaves not sagittate at the bas
Leaves linear or lanceolate, rarely more than 1.5 cm wide (Fig. 64, c). 17. *Erysimum*
Leaves more than 1.5 cm wide, lobed (Fig. 63, c). 12. *Brassica*

I. **DRABA** (Dill.) L.

a. Lower part of stem and foliage, especially when young, closely and minutely stellate-pubescent; lowest pedicels 3-15 mm long. 1. *D. arabisans*
a. Lower part of stem and foliage with numerous simple or forking, also often a few occasional stellate, long hairs; lowest pedicels 1-5 mm long. 2. *D. norvegica*

1. **D. arabisans** Michx. DRABA.

Collected but once; coniferous slope of Cape Blomidon, where a colony several yards in diameter was growing on the steep basaltic slope. June.

Nfld. through northern N. B., to northern N.Y., west to the north shore of Lake Superior.

2. **D. norvegica** Gunner, see Fernald, Rhodora **36**: 321-326. 1934.

The only record is by Fernald; "crevices of rocks, Big Intervale, Margaree, C. B. Island, J. Macoun, no. 18,987." Several other species found about the Gulf of St. Lawrence may be expected in some of the ravines of northern C. B.

Nfld. and Strait of Belle Isle to C. B., and Hudson Bay.

2. **BERTEROA** DC.

1. **B. incana** DC. HOARY ALYSSUM.

Local; abundant near Aylesford, Kings Co., and locally

southward in the same county; elsewhere unknown. June-Sept.

Introduced from Eu. and locally common in eastern N. A.

3. THLASPI (Tourn.) L.

1. **T. arvense** L. FIELD PENNY CRESS. Fig. 62, a.

Introduced and scattered; mostly about dwellings, along roadsides and in waste places about towns or along railroads, probably introduced mostly in western grains and often seen. It does not seem to persist nor to spread out into the fields. July-Sept.

Eu.; grain fields in western N. A.

Fig. 62.—**Thlaspi.** a, plant, x ½. **Lepidium.** b, **L. densiflorum,** x ½. **Capsella.** c, small plant, x ½. **Neslia.** d, leaf and inflorescence, x ½. **Coronopus.** e, **C. didymus,** small part of plant, x ½.

4. LEPIDIUM (Tourn.)L. PEPPERGRASS.

a. Stem leaves clasping with the cordate base, grayish-hairy.

b. Fruit ovate or spoon-shaped, surrounded by a wide wing at the tip. 5. *L. campestre*

b. Fruit heart-shaped and thick, tipped with a conspicuous style, not surrounded by a wing. 6. *L. Draba*

a. Stem leaves petioled or sessile, but not clasping.

c. Pod and seeds entirely wingless; leaves twice pinnately-lobed; petals none. 3. *L. ruderale*

c. Pod plainly winged, at least above; leaves entire or lobed; petals present or absent.

d. Pods slightly winged above, orbicular or oval, generally 2-3 mm long; only the lower leaves ever pinnately lobed; stamens usually 2.

e. Petals present, up to 2 mm long; hairs on the main axis of the inflorescence curved and sharp. 1. *L. virginicum*

e. Petals absent or if present very small and narrow; hairs on the main axis of the inflorescence short and stout. 2. *L. densiflorum*

d. Pods widely winged around both sides, generally ovate-orbicular, longer than wide; leaves generally all pinnately lobed; stamens 6. 4. *L. sativum*

1. **L. virginicum** L. PEPPERGRASS. Fig. 62, b.

Collections examined are about equally divided betwen this and the next species. Most of the plants seen were from the center of the province, but the species is undoubtedly present throughout. May-Sept.

Nfld. to Minn. south to Fla.

2. **L. densiflorum** Schrad.

Becoming a common weed, especially on the lighter soils of the Annapolis Valley; scattered by roadsides, towns and railroads elsewhere. May-Sept. (*L. apetalum* Willd.).

N. S. to B. C. south to Tex.; introduced from Eu.

3. **L. ruderale** L. NARROW-LEAVED PEPPERGRASS.

Old records show the plant to be found from Windsor to Sydney; collections have been seen from Windsor, Pictou and Sydney. It is rare.

Introduced from Eu. about seaports from N. S. to Tex.

4. **L. sativum** L. GARDEN CRESS.

Occasionally found as a weed in gardens, or persisting in the autumn; not spreading to native habitats.

Introduced from Eu. and commonly cultivated.

5. **L. campestre** (L.) R. Br. Field Peppergrass. Map 243.

Waste places; Yarmouth and occasionally elsewhere. June-July.

Introduced from Eu. and widespread in eastern America.

6. **L. Draba** L. HOARY CRESS.

Roadsides, waste places and ballast; Yarmouth, scarce (Fernald, 1921); occasionally elsewhere, usually about railroads. June-Aug. [*Cardaria Draba* (L.) Desv., Rhodora **42**: 304. 1940].

Introduced from Eurasia; N. S. and Ont. westward.

5. CORONOPUS Ludwig

a. Fruit notched at the summit, so that the two nutlets are distinct, rough-wrinkled. 1. *C. didymus*

a. Fruit not notched at the summit, so that the two nutlets seem like two halves of a sphere, tubercled. 2. *C. procumbens*

1. **C. didymus** (L.) Sm. SWINE or CARPET CRESS. Fig. 62, e. Map 244.

Occasional in waste ground, railroad yards and about seaports; rather common in such situations in Digby and Yarmouth Cos. May-Aug.

Introduced from Eurasia; throughout N. A.

2. **C. procumbens** Gilibert.

Rare and infrequently introduced; known from Pictou where it was first recorded by Lawson (1891) as being collected on ballast in 1883. (*C. Coronopus* Karst.).

Rare; introduced from Eu.

6. SUBULARIA L.

1. **S. aquatica** L. AWLWORT. Fig. 63, a. Map 245.

Sandy and gravelly bottoms of lakes; rather common in Digby and Yarmouth Cos.; east to Lunenburg and Halifax Co.; found also in southern Antigonish Co. and at Warren Lake at Ingonish, Victoria Co. Aug.-Sept.

Local; Nfld. to B. C. south to N. Eng. & Calif.

7. CAPSELLA Medic.

1. **C. Bursa-pastoris** (L.) Medic. SHEPHERD'S PURSE. Fig. 62, c.

Common throughout in gardens, cultivated fields and waste places; very variable; early May to Nov.

Introduced from Eu.; throughout N. A.

8. CAMELINA Crantz.

1. **C. microcarpa** Andrz. FALSE FLAX.

Occasional in grain fields and a casual weed around railroad yards. Older records of *C. sativa* (L.) Crantz., a plant with smooth stems, and pods 6-7 mm wide, were made before *C. microcarpa* was recognised as a separate species.

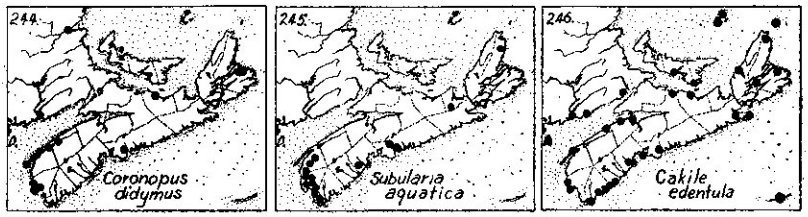
Introduced from Eu.; common in western America and becoming established eastward.

9. NESLIA Desv.

1. **N. paniculata** (L.) Desv. BALL MUSTARD. Fig. 62, d.

Scattered in grain fields, about railroad yards and in waste places. July-Sept.

N. S. to B. C. locally south to Penn.; commoner westward.



10. CAKILE (Tourn.) L.

1. **C. edentula** (Bigel.) Hook. AMERICAN SEA ROCKET. Fig. 63, e. Map 246.

Common around the coast on sandy beaches, dunes and cliffs; in brackish lakes on Sable Is.; and on shingle beaches. July-Sept.

Atlantic Coast from Nfld. to Fla.; on the Pacific Coast, and a variety about the Great Lakes.

11. RAPHANUS (Tourn.) L.

1. **R. Raphanistrum** L. WILD RADISH, CADLOCK. Fig. 63, d.

A common and troublesome weed throughout, but especially so in the Annapolis Valley. It is still actively

spreading and increasing in abundance in many areas of the province. June-Sept.

Introduced from Eu.; Nfld. to Ont. south to Penn.

12. **BRASSICA** (Tourn.) L. MUSTARD

a. Upper stem-leaves clasping; plant glabrous. 1. *B. campestris*

a. Upper stem-leaves tapering to the base, little or not clasping.

b. Beak of the pod terete, slender, much narrower than the pod, without seeds in its base.

c. Pods 3-7 cm long, 2-3.5 mm thick, rather 4-sided, spreading, the beak 6-12 mm long; pedicels 7-10 mm long. 2. *B. juncea*

c. Pods 1-2 cm long, about 1 mm thick, appressed to the axis of the inflorescence, the beak 1.5-3 mm long; pedicels 3-6 mm long. 3. *B. nigra*

b. Beak of the pod flattish, about as wide as the pod, often with a seed in the base.

d. Fruiting pedicels 3-7 mm long; pods slender, about 2 mm thick, smooth. 4. *B. arvensis*

d. Fruiting pedicels about 10 mm long; pods 4 mm thick, stiff-hairy. 5. *B. hirta*

1. **B. campestris** L. FIELD MUSTARD.

Occasional as an escape or as a weed in fields. July-Sept.

Widely introduced from Eu. into N. A.

2. **B. juncea** (L.) Cosson. INDIAN MUSTARD.

Becoming a bad weed about towns, and gradually spreading out into the country. Its large size and seed production destine it to be one of the commonest weeds in the future. June-Aug.

Recently introduced from Asia into N. A.; widely scattered.

3. **B. nigra** (L.) Koch. BLACK MUSTARD. Fig. 63, b.

Common about towns, often a troublesome weed in fields and orchards, but as yet rather local. June-Oct.

Widely introduced from Eurasia.

4. **B. arvensis** (L.) Ktze. WILD MUSTARD. Fig. 63, c.

Occasional in orchards and fields; scattered in towns and about ports, much rarer than the other yellow-flowered species of the family. It seems to be rapidly spreading where it is established and to be crowding out the commoner and earlier established wild radish. Late June-

Aug. [*B. kaber* (DC) Wheeler, var. *pinnatifida* (Stokes) Wheeler, Rhodora **40**: 308. *Sinapsis arvensis*].

Widely introduced into N. A. from Eu.

Fig. 63.—**Subularia.** a, plant, x 1. **Brassica.** b, fruits of **B. nigra**, x 1. c, **B. arvensis**, x 1/3. **Raphanus.** d, part of plant, x 1/3. **Cakile.** e, branch of plant, x ½. **Nasturtium.** f, branch of plant, x ½.

5. **B. hirta** Moench. WHITE MUSTARD.

Sparingly introduced in seed, not persisting and no specimens have been seen. Earlier records of *B. alba* belong here. July-Aug.

Introduced from Eu. and appearing locally.

13. DIPLOTAXIS DC.

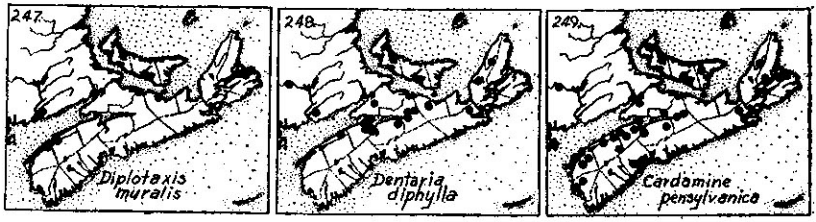
a. Annual; plant branched from near the base, the leaves chiefly basal; fruiting pedicels 5-15 mm long. 1. *D. muralis*

a. Perennial; stem bushy, leafy to the inflorescence; fruiting pedicels 20-30 mm long. 2. *D. tenuifolia*

1. **D. muralis** (L.) DC. SAND ROCKET. Map 247.

Waste places about the ports, rare and little reported; ballast heaps and ballast at Pictou and North Sydney (Macoun); Pictou Landing (Robinson, 1906). June-Aug.

Adventive from Eu.; N. S. to Penn.



2. **D. tenuifolia** (L.) DC. WALL ROCKET.

This species was collected long ago at Pictou and North Sydney in company with the preceeding species; found at Pictou by Fernald and St. John in 1914. June-Aug.

Adventive from Eu. into eastern N. A. & Calif.

14. CONRINGIA (Heist.) Link

1. **C. orientalis** (L.) Dumort. HARE'S-EAR MUSTARD.

Casual around railroads yards; Yarmouth through the Annapolis Valley to Cumberland Co.; probably also elsewhere.

Introduced from Eu.; N. S. to Man. & Ore. south to Dela.

15. SISYMBRIUM (Tourn.)L. HEDGE MUSTARD

a. Leaves coarsely divided with wide lobes; fruits 1-2 cm long, the pedicels 1-2 mm long, closely appressed to the stem (Fig. 64, a).
b. Fruits and foliage puberulent. 1. *S. officinale*
b. Fruits and foliage glabrous. *S. officinale* var. *leiocarpum*
a. Leaves finely divided into linear lobes; fruits ascending on widely-spreading pedicels (Fig. 64, b).
c. Plant 1-2 m high; fruits 6-8 cm long, as wide as the thickened pedicels. 2. *S. altissimum*
c. Plant 3-6 dm high; fruits about 2 cm long, much wider than the pedicels; leaves very finely divided. 3. *S. Sophia*

1. **S. officinale** (L.) Scop. HEDGE MUSTARD. Fig. 64, a.

Common throughout; waste places about towns, scattered along roadsides, houses, etc. Var. **leiocarpum**

DC. is found in similar habitats and is perhaps more common. July-Sept.

Locally introduced from Eu. into eastern Can. and the U. S.

Fig. 64.—**Sisymbrium.** a, **S. officinale**, x ½. b, **S. altissimum**, leaf and fruit, x ½. **Erysimum.** c, **E. cheiranthoides**, x ½. **Barbarea.** d, plant, x ¼. **Cardamine.** e, **C. pensylvanica**, x ½.

2. **S. altissimum** L. TUMBLE HEDGE MUSTARD. Fig. 64, b.

Common in the Annapolis Valley around towns and spreading rapidly into the country; common in towns throughout and locally elsewhere in light or sandy soils. It is becoming one of the common and important weeds. July-Aug.

Introduced from Eu.; N. S. to B. C. south to Va.

3. **S. Sophia** L. TANSY MUSTARD.

Rare; occasionally seen in waste places, especially in Pictou Co. (*Descurainia Sophia* Webb.).

Introduced from Eu.; N. S. to N. Y. and westward.

16. **HESPERIS** (Tourn.) L.

1. **H. matronalis** L. ROCKET, DAME'S VIOLET.

Occasional and local along roadsides and about buildings. It is an old garden plant formerly more commonly grown, and still persisting in many places. June-July.

Introduced from Eu.; N. S. to Iowa south to N. C.

17. **ERYSIMUM** (Tourn.) L.

a. Annual; leaves lanceolate; pods 1-2 cm long on slender pedicels 6-8 mm long. 1. *E. cheiranthoides*

a. Perennial; leaves linear-lanceolate; pods 2.5-6.2 cm long, on stout pedicels about 4-6 mm long. 2. *E. inconspicuum*

1. **E. cheiranthoides** L. WORMSEED MUSTARD. Fig. 64, c

A very common weed throughout, in cultivated places and waste places. June-Sept.

Nfld. to the Pacific south to Tenn.

2. **E. inconspicuum** (Wats.) MacM.

Rare; gravelly railroad yard, Springhill Junction (Fernald, 1921). Earlier records of *E. parviflorum* probably belong here.

Ontario westwards; sparingly introduced in the East.

18. **NASTURTIUM** R. Br.

1. **N. officinale** R. Br. WATER CRESS. Fig. 63, f.

Common in slow-moving water on the marshes at Truro and in Pictou Co.; very common, often choking the streams above and in the dykelands in Kings Co.; scattered in cold streams or in springs elsewhere in the northern counties. July-Sept.

Introduced from Eu. and widely spread; originally cultivated.

19. **RORIPPA** Scop.

Marie-Victorin. Le genre *Rorippa* dans le Quebec. Contrib. Inst. Bot. Univ. Montreal **17**: 1930. Butters & Abbe. Rhodora **42**: 25-32. 1940. Fernald, M. L. The eastern American varieties of *Rorippa islandica*. Rhodora **42**: 267-274. 1940.

a. Petiole of the medium leaves auriculate and clasping at the base; fruit 1-4 mm long; plants annual, without creeping rootstocks.
b. Stem and leaves glabrous or nearly so; pods 3-4 mm long. 1. *R. islandica* var. *microcarpa*
b. Stem and leaves more or less pubescent; pods mostly less than 3 mm long. *R. islandica* var. *hispida*
a. Petiole of the medium leaves not auriculate nor clasping at the base; pod linear, to 15 mm long; plants perennial with creeping rootstocks. 2. *R. sylvestris*

1. **R. islandica** (Oeder) Borbas, var. **microcarpa** (Regel) Fern. MARSH CRESS. Fig. 65, c.

Scattered in Kings and Colchester Cos., and occasionally elsewhere, especially about the towns of Windsor, Glace Bay and Halifax. It is a bad weed which may at times occupy part of an orchard or grain field. [*Radicula palustris* (L.) Moench.] July-Sept. Introduced from Eu. and throughout N. A.

Var. **hispida** (Desv.) Butters & Abbe is common in the center of the province in ditches, wet mud, along streams, fields and waste places; scattered elsewhere about towns.

Throughout temperate N. A. and in Eurasia.

2. **R. sylvestris** (L.) Bess. CREEPING YELLOW CRESS.

This introduced species promises to become a pernicious weed. It is known from Pugwash, Lunenburg and Chester. July-Aug.

Sparingly introduced across the continent; from Eu.

20. ARMORACIA Gaertn.

1. **A. rusticana** Gaertn. HORSE-RADISH.

Infrequent around old gardens in rich soil; propagating mainly from rootstocks; rarely flowering. June. [*R. Armoracia* (L) Robinson].

Widely introduced into N. A. from Eu.

21. ERUCASTRUM Presl.

1. **E. gallicum** (Willd.) Schulz. DOG MUSTARD.

Reported only from Coldbrook, Kings Co. (Groh, Scientific Agriculture, **13**: 722-727. 1933).

Common in western America, sparingly found eastward; introduced from Eu. and a bad weed.

22. **BARBAREA** R. Br.

a. Pedicels ascending to erect; raceme dense; siliques strongly ascending. 1. *B. vulgaris*

a. Pedicels spreading; raceme lax and open; siliques arcuate-ascending to widely spreading. var. *arcuata*

1. **B. vulgaris** R. Br. YELLOW ROCKET. Fig. 64, d.

Common in rich soils, on intervales and often in orchards in the Annapolis Valley; apparently being introduced at the present time in grain or grass seed and appearing as scattered individuals in seeded fields throughout the province. (*B. stricta* Andrz.). Late May-early June. Widely distributed in N. A.

Var. **arcuata** (J. & C. Presl) Fries, see Fernald, Rhodora **45**: 304. 1943, is scattered with the species and often more common. Introduced, like the species, from Eu. and widely distributed.

23. **DENTARIA** (Tourn.) L.

1. **D. diphylla** Michx. TOOTHWORT. Map 248. Fig. 65, b.

Rich moist soil along brooksides and in low, wet, or rocky woods; general but not abundant from Annapolis Co. eastward to C. B. May 15-June 15.

N. S. to Minn. south to S. C.

24. **CARDAMINE** (Tourn.) L.

a. Flowers large, 10-15 mm wide, tinged with purple; plant perennial 1. *C. pratensis.*

a. Flowers 5 mm or less wide; plants annual or biennial.

b. Leaves of 2-7 broad segments with the terminal one larger; plants of moist or wet soils. 2. *C. pensylvanica*

b. Leaves of 5-9 narrow segments, the terminal ones scarcely longer; plants of dry or rocky soil. 3. *C. parviflora*

1. **C. pratensis** L. CUCKOO FLOWER. Fig. 65, a.

Common along the Annapolis River system in meadows moist roadsides and low areas; beginning to get established along the Cornwallis River. Late May-early June.

Introduced about 20 years ago in grass seed from Eu.

2. **C. pensylvanica** Muhl. BITTER CRESS. Fig. 64, e. Map 249.

Common in swamps, along streams and mucky areas

throughout; often with the base rooting in mud under the surface of the water. May-July.

Lab. to Minn. South to Fla.

3. **C. parviflora** L. var. **arenicola** (Britt.) Schultz., see Rhodora **29**: 192. 1927.

A collection from a dry rocky beach west of Halifax in the Herbarium at the Agricultural College is placed here. Aug.

N. S.; Que. to Ont. south to Ga.

25. ARABIS L.

1. **A. Drummondi** Gray. ROCK CRESS.

Dry ledges, gravelly beaches, rocky streams; rare. It was found once on the sandstone slope of Cape Blomidon; scattered in northern C. B. from Big Intervale at Margaree to Cape North. May-early June.

Nfld. south to N. Y. and west to the Rockies.

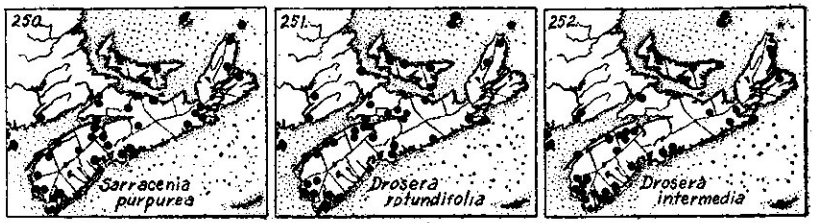
49. SARRACENIACEAE PITCHER-PLANT FAMILY

1. SARRACENIA (Tourn.) L.

1. **S. purpurea** L. PITCHERPLANT. Fig. 65, f. Map 250.

Bogs and swamps, bog meadows and sphagnous lake margins throughout; commonest in the southwestern counties and in northern C. B.; rather rare in the north-central counties. June 15-July. Forma **heterophylla** (Eaton) Fern., Rhodora **24**: 174. 1922, has greenish-yellow flowers and no purple veins in the foliage. This occurs with the species at Young's Lake, North Mt., Belle Isle, Annapolis Co.

Lab. to Man. south to N. J. & Ill.



50. DROSERACEAE SUNDEW FAMILY

1. DROSERA L.

a. Leaf-blades round or broader than long; petioles hairy.
1. *D. rotundifolia*

a. Leaf-blades spatulate or much longer than wide; petioles smooth.
2. *D. intermedia*

1. **D. rotundifolia** L. ROUND-LEAVED SUNDEW. Fig. 65, e. Map 251.

Abundant throughout; bogs, barrens, lake margins, ditches, and swamps. Plants growing in bog water may, be strung out on stems several feet long. July 15-Aug. 15.

Lab. to Alaska south to Calif. & Fla.

Fig. 65.—**Cardamine.** a, **C. pratensis,** x 1/3. **Dentaria.** b, top of plant, x ½. **Rorippa.** c, **R. islandica,** small part of plant, x ½. **Drosera.** d, **D. intermedia,** leaf, x 1. e, **D. rotundifolia,** x 2/3. **Sarracenia.** f, plant, x ¼.

2. **D. intermedia** Hayne NARROW LEAVED SUNDEW. Fig. 65,d. Map 252.

This species is nearly as common as the last; in boggy depressions, and wet sandy or peaty soil. It is very rare on Sable Is., while the first species is abundant. Fernald (1921) records a hybrid of these two species, and exactly intermediate between them, from a knoll in a wet peaty slough in the barrens at Lower Argyle, Yarmouth Co.

Nfld. to Minn. south to Fla. and La.

51. CRASSULACEAE ORPINE FAMILY

a. Sepals, petals and pistils 4-5 , the stamens 8-10; flowers on a stalked inflorescence, yellow or rose; plants mostly larger than 8 cm high. 1. *Sedum*

a. Sepals, petals and pistils 3-4, the stamens the same number; flowers solitary, nearly sessile, greenish white; plant 1-8 cm high. 2. *Tillaea*

1. SEDUM (Tourn.) L.

a. Leaves nearly terete, small and short; flowers yellow. 1. *S. acre*

a. Leaves broad and flat.

b. Flowers purplish or rose, with both stamens and pistils, the parts mostly in 5's.

c. Stem-leaves alternate or spirally arranged; erect, not forming large patches. 2. *S. triphyllum*

c. Stem-leaves opposite or whorled; plants decumbent with the flowering branches ascending, forming large patches. 3. *S. stoloniferum*

b. Flowers greenish-yellow or turning purplish, with stamens and pistils on separate flowers, the parts in 4's; rocky sea shores. 4. *S. roseum*

1. **S. acre** L. MOSSY STONECROP. Fig. 66, b.

Occasional on ledgy roadsides or moist roadside banks in the southwestern counties and scattered east to Kings and Halifax Cos. July.

Naturalized from Eu. and a local escape; N. S. to Ont. & Ind. south to Va.

2. **S. triphyllum** (Haw.) S. F. Gray. LIVE-FOR-EVER Fig. 66, c.

Scattered throughout; moist areas, often at the edges of thickets. Aug.-Sept. (*S. purpureum* Tausch).

Introduced from Eu.; widely distributed.

3. **S. stoloniferum** Gmel. Map 253.

Spreading to rocky or gravelly roadsides at many points from Kings to Yarmouth and Shelburne Cos.; local east to Pictou. It usually grows in large patches with the matted, prostrate stems on the surface of the ground. Rather rapidly spreading.

Introduced from Asia; local from N. S. to N. Eng.

4. **S. roseum** (L.) Scop. ROSE-ROOT. Fig. 66, d. Map 254.

Crevices of rocky cliffs in the colder parts of the shoreline; scattered along the Bay of Fundy; rare on the Atlantic Coast; common on cliffs in northern C. B. June.

Greenland to Lab. south to the coasts of Me.; locally inland.

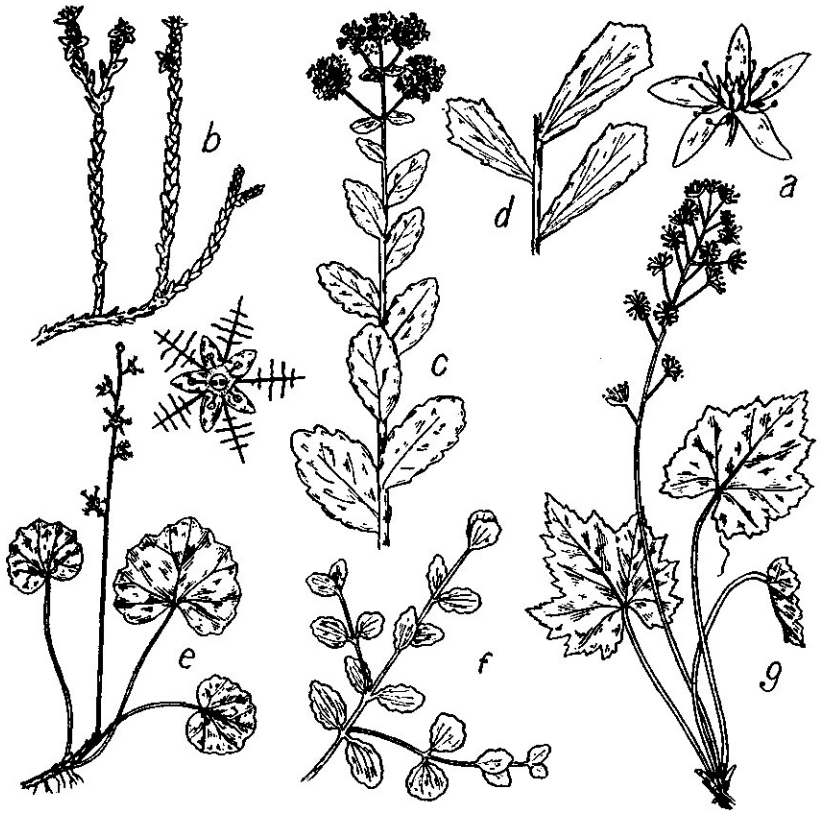


Fig. 66.—**Sedum.** a, flower, x 3. b, **S. acre,** x ½. c. **S. triphyllum,** top of plant, x ½. d, **S. roseum,** leaves, x ½. **Mitella.** e, plant, x ½. **Chrysosplenium.** f, branches, x ½. **Tiarella.** plant, x 1/3.