5. CLEMATIS L.

1. **C. virginiana** L. Map 289. Fig. 75, a. VIRGIN'S-BOWER

This is one of our few vines, climbing by the bending of the petioles of the leaves. It is scattered throughout, most common in the north-central counties: banks of streams, stony banks, ravines and climbing over thickets. It is one of the more common 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 L.

1. **C. palustris** L. Fig. 75, d. Map 288. MARSH-MARIGOLD

This plant has a sharply restricted range on marshy places along the coastal plain of northern Inverness Co. The collection of Macoun from Whycocomagh and the record in Lindsay's list from Mahone Bay have not been substantiated in recent years although several attempts have been made to relocate them. Inverness Co.: swale back of beach near Mabou; wet meadow, Northeast Margaree; wet river edge, Margaree River near Margaree Harbour; wet places Terre Noire; wet places, St. Joseph du Moine; swamp, Cheticamp; occasional in marsh near the mouth of the Grand Anse Brook, Pleasant Bay (Smith and Erskine, 1954). Early June.

Lab. to Alaska south to S.C.

7. COPTIS Salisb.

1. **C. trifolia** (L.) Salisb. Fig. 75, c. GOLDTHREAD

Common throughout; coniferous forests, swamps, bogs, roadside banks, etc. One colony of plants growing in a spruce wood at Bay St. Lawrence was found to have the leaflets finely dissected. The N. Amer. plants have larger follicles and other minor characters and may be designated as subspecies *groenlandica* (Oeder) Hulten.

Lab. to Alaska south to Md. and in the mts. to N.C.

8. AQUILEGIA L.

1. **A. vulgaris** L. Fig. 75, b. GARDEN-COLUMBINE

A garden-escape established in many parts of the Province where it has spread to roadsides, fields and damp hollows, especially in rich, shady locations. Double forms and various colors are occasionally seen. Late May-early June.

Introduced from Eu. and widely established.

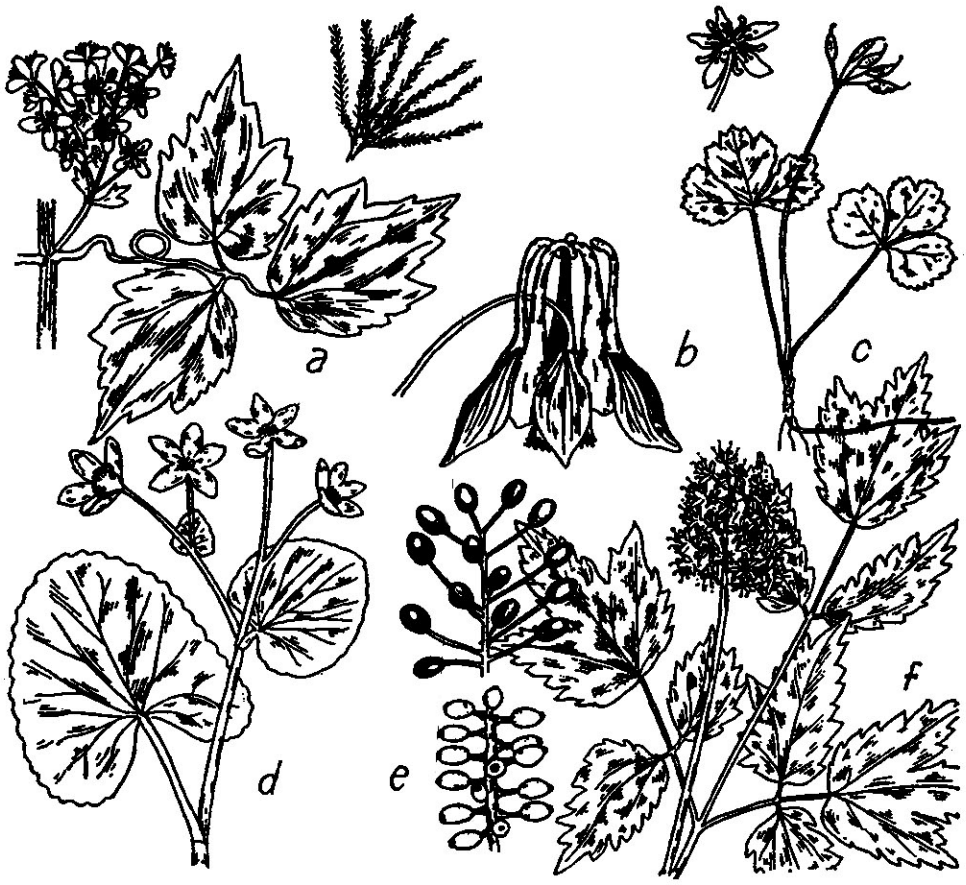


Fig. 75. **Clematis:** (a) *C. virginiana* x ½, achenes x 1. — **Aquilegia:** (b) flower x ½. — **Coptis:** (c) fruiting plant and flower x ½. — **Caltha:** (d) *C. palustris* x ¼. — **Actaea:** (e) *A. pachypoda*, fruiting raceme x ½, (f) *A. rubra*, plant and fruiting raceme x ½.

9. ACONITUM L. MONKSHOOD

See "The Cultivated Aconites" (Munz, 1945).

1. A. Napellus L. MONKSHOOD

This genus is very variable and many of the plants sold under this name belong to different species. *A. Napellus* has the leaves divided into a number of linear segments; and the inflorescence is spike-like with the pedicels often pubescent. The two following species, both with glabrous pedicels, have been occasionally found about old house-sites or rarely escaping to roadsides. *A. bicolor* Schultes has the segments of the leaves ¼ inch wide, with the flowers mostly white with purple margins and the helmet strongly arched and gaping with a short beak. *A. variegatum* L. has the leaves palmately 3-lobed, the helmet wider than long and without a prominent beak.

Nfld. to Ont. and N.Y.; introduced from Eu. and spreading from cultivation.

10. ACTAEA L. BANEBERRY

Perennial woodland plants with large 2-3-compound leaves and with small flowers in a long-stalked terminal raceme; fruit a several-seeded berry which is poisonous.

a. Ovary wider than the stigma; leaves pubescent over the whole lower surface; fruit usually red, with slender pedicels 8-15 mm long. 1. *A. rubra*

a. Ovary narrower than the cap-like stigma; leaves glabrous beneath except for a few hairs on the veins; fruit glossy white, on thick stout pedicels 3-10 mm long. 2. *A. pachypoda*

1. **A rubra** (Ait.) Willd. Fig. 75, f. Map 290. RED BANEBERRY

Characteristic of hardwood forests in the richer soils and along the edges of intervales; most common from Annapolis Co. to northern C.B., rare to absent in the southwestern counties and along the Atlantic Coast. May 15-May 30.

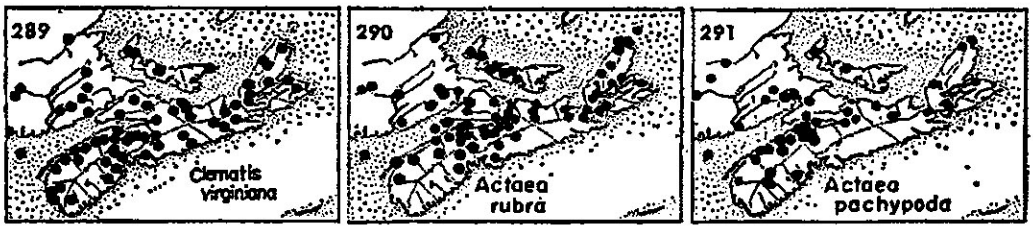
Forma **neglecta** (Gillman) Robins. has pure white berries. This form is common on many of the intervales of Kings and Colchester Co.; Jeffers Brook, Cumberland Co.; and scattered in central and northern C.B.

Lab. to Alaska south to N.J. and Nebr.

2. **A. pachypoda** Ell. Fig. 75, e. Map 291. WHITE BANBERRY

Characteristic of hardwood climax forests and intervales, rocky or open woodlands, around the edges of woods, generally in loamy or somewhat light soils. Annapolis and Cumberland Co. to northern C.B.; absent or very rare in the counties along the Atlantic Coast and in southwestern N.S. Late May-early June. (*A. alba* (L.) Mill of other authors). See Fernald (1940).

N.S. to Ont. south to Ga. and Mo.



48. BERBERIDACEAE BARBERRY FAMILY

A small family with the species most numerous in eastern Asia. The sepals, petals and stamens are in 6's; sepals petal-like and the petals smaller or reduced to small gland-like bodies. The May-apple, *Podophyllum peltatum* L., has been planted and persists, as at Wittenburg in

Colchester Co., but scarcely spreads. This is a low herb with peltate, deeply-lobed leaf and one flower per plant forming an ovoid pulpy fruit.

a. Plants herbaceous with blue, berry-like fruits; leaves 3- parted and divided, bluish-green and glaucous when young; flowers greenish-purple. 1. *Caulophyllum*
a. Plants shrubby, spiny; berries red; introduced shrubs. 2. *Berberis*

1. CAULOPHYLLUM Michx.

1. **C. thalictroides** (L.) Michx. Map 287. BLUE COHOSH

This is a rare but distinctive plant. The fertile stem has one large sessile 3-ternate leaf part way up and a smaller one just below the panicle. A few plants are present under sugar maples on the intervale at Kemptown, Colchester Co. and it is scattered in hardwoods a few miles north; found by Schofield in woods at the edge of intervales at Brooklyn Corner and at Cambridge, Kings Co.; very rare in a meadow thicket, Melford, Inverness Co.

N.S. to Man. south to the mts. of S.C.

2. BERBERIS L. BARBERRY

a. Leaves with spiny-toothed edges; thorns mostly in 3's; berries in hanging racemes as with currants. 1. *B. vulgaris*
a. Leaves with smooth edges; thorns mostly solitary; berries in small clusters as with gooseberries. 2. *B. Thunbergii*

1. **B. vulgaris** L. Fig. 76, a. COMMON BARBERRY

Formerly much planted as an ornamental around drive-ways 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-appearing rust-resistant species are now being planted.

Native of Eu.; widely introduced.

2. **B. Thunbergii** DC. JAPANESE BARBERRY

Commonly planted as an ornamental shrub or for hedges; occasionally found as an escape or waif. Native of Japan and widely distributed as an ornamental.

49. PAPAVERACEAE POPPY FAMILY

The plants of this family exude a milky or brightly-colored juice; sepals 2, soon falling; petals 4 to numerous; stamens many.

a. Perennial, stemless; juice bright red; leaves large and palmately lobed; petals 4-12, white (Fig. 76, b); native. 1. *Sanguinaria*

a. Biennial, tall and branched; juice orange; leaves coarsely pinnatifed; petals 4, yellow (Fig. 76, c). 2. *Chelidonium*
a. Annual, low; juice whitish; leaves pinnately lobed; petals 4, large, reddish to scarlet; poppies. 3. *Papaver*

1. SANGUINARIA L.

1. **S. canadensis** L. Fig. 76, b. Map 292. BLOODROOT

Low ground near streams and in rich intervales, usually in shade; often growing just above high-water level along the rivers. Kings Co.: rare in rich thicket at Cambridge (Schofield, 1949); Hants Co.: rather rare; common around Truro and along many of the streams and rivers, abundant on the wooded intervale at Kemptown; scattered in Cumberland Co., as at Mapleton and Waugh's River; to Middle River, Big Baddeck and N.E. Margaree in C.B. where it may form a carpet covering large areas. This plant is variable and several dubious varieties have been proposed. Early May.

N.S. to Man. south to Fla.

2. CHELIDONIUM L.

1. **C. majus** L. Fig. 76, c. CELANDINE

Fairly common about towns and villages in southern Digby, Yarmouth and Shelburne Co.; scattered eastward, Port Medway, Milton and Halifax. July-Aug.

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

3. PAPAVER L. POPPY

a. Leaves merely toothed, rounded at the base and prominently clasping; peduncle smooth or with but a few scattered hairs. 1. *P. somniferum*
a. Leaves deeply toothed to pinnately lobed, tapering to the base; peduncle bristly hairy, at least below.
b. Capsule subglobose to broadly obovoid, rays on the upper surface of the stigma 8-14, usually 10. 2. *P. Rhoeas*
b. Capsule club-shaped, twice as long as wide or more; rays of the stigma 5-9. 3. *P. dubium*

1. **P. somniferum** L. POPPY

Occasional on rubbish dumps and in waste places; Sydney, Bridgewater, Yarmouth, and scattered elsewhere.

Introduced from Eurasia; an ornamental flower.

2. **P. Rhoeas** L. CORN-POPPY, SHIRLEY 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 across Canada.

3. **P. dubium** L.

Very similar to the preceding species; sparingly introduced and known from N.S. and N.B.

N.S. to N.C. west to Mo.; native of Eu.

50. FUMARIACEAE FUMITORY FAMILY

Glabrous herbs with thin, finely divided or dissected leaves and watery juice; flowers irregular, with two small sepals; petals 4, one or both of the two outer ones spurred or saccate at the base; stamens 6.

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, leaves all basal; petals slightly united, not spongy; seeds crested (Fig. 76, e). 2. *Dicentra*
a. Corolla with but one of the petals spurred or saccate at the base.
c. Fruit oblong, several-seeded; flowers purplish-green or rose colored with yellowish tips, 10-15 mm long (Fig. 76, 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 now seldom seen, collected by J. S. Erskine, among weeds, Point Pleasant Park, Halifax.

Eastern Que. to Wisc. south to N.C.

2. DICENTRA Bernh. DUTCHMAN'S-BREECHES

1. **D. Cucullaria** (L.) Bernh. Fig. 76, e. Map 293.

Rich woods, intervales and hardwood hillsides; Cape Blomidon, Kings Co. and Moose R. in Cumberland Co.; common in the Cobequids and around Truro, east to central and northern C.B. at Cape North. It is best developed on the intervales and hardwood slopes in Colchester and Pictou Co., more restricted to intervales eastward. May 20-June 10.

N.S. to N.D. south to Ga. and Mo.

3. CORYDALIS Medic.

1. **C. sempervirens** (L.) Pers. Fig. 76, d. Map 294. PINK CORYDALIS

Common in the Annapolis Valley and Cumberland Co. to northern C.B.; probably scattered throughout although it seems rare along the

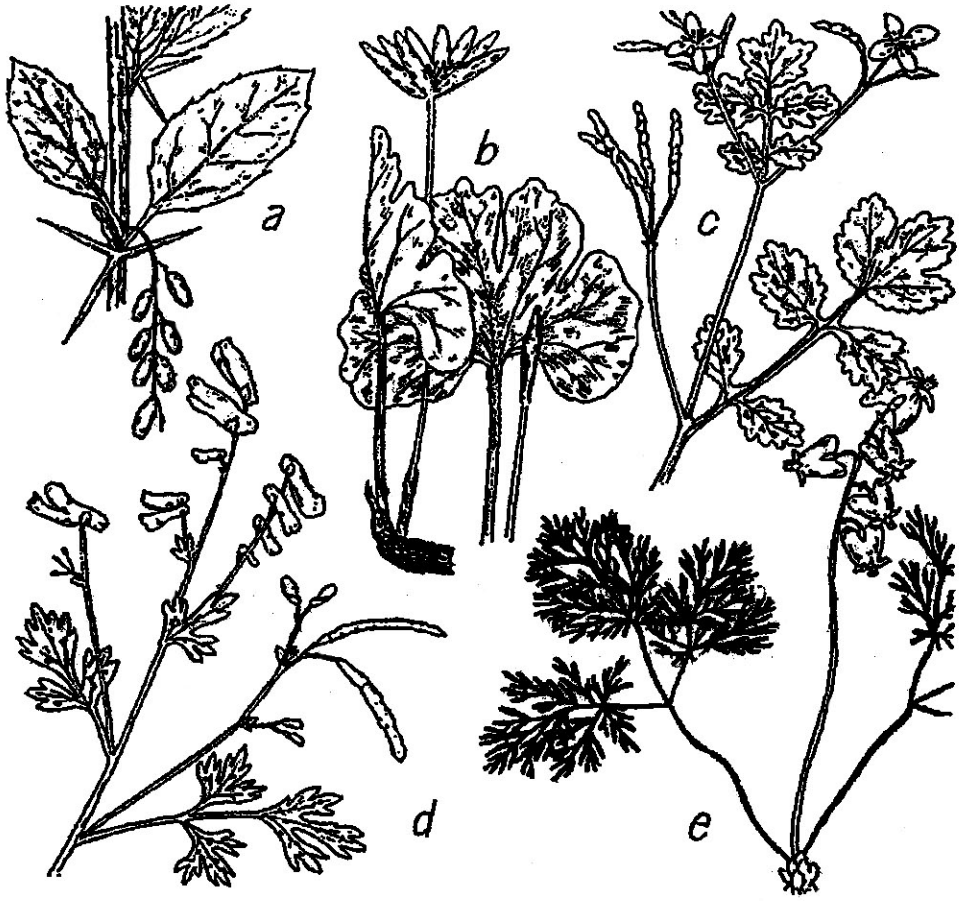
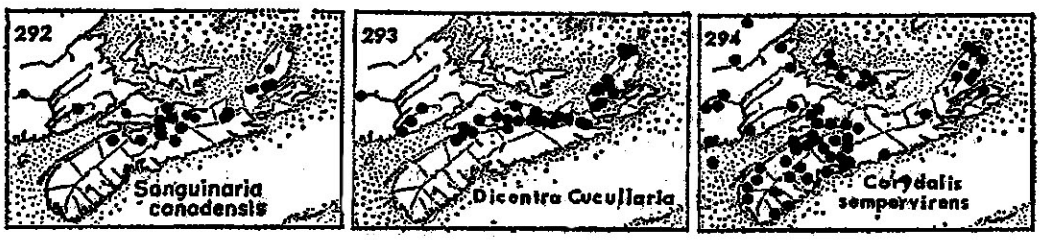


Fig. 76.—Berberis: (a) *B. vulgaris* x ½. — Sanguinaria: (b) flowering plant x ½. — Chelidonium: (c) top of plant x ½. — Corydalis: (d) part of plant x ½. — Dicentra: (e) *D. Cucullaria* x ⅔.

Gulf of St. Lawrence and Guysborough Co.; rocky places where leaf mould has washed into hollows and pockets; most noticeable the first year on newly-burnt land and in new-cleared areas where it grows from seeds that have lain dormant. June-Sept.

Nfld. to Alaska south to Ga., Minn. and Kans.



4. FUMARIA 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

Scattered; occasionally about gardens where it is cultivated or persisting; Lawson (1890-1) records it as sparingly spontaneous in gardens in Halifax; now more often seen as a ballast weed or on gravelly or rocky beaches, as at Mill Village, Westport, Windsor, Guysborough and Havre Boucher. In one field in Cumberland Co. the farmer reported it as a bad weed. July-Aug.

Introduced from Eu.; scattered and widespread.

2. F. parviflora Lam.

Formerly sparingly introduced around some of the seaports of the New World (Lawson, 1890-1); Macoun records it from waste heaps at Bedford, Pictou and North Sydney. No recent collections have been made and it is doubtful if this plant persists in the Province.

51. CRUCIFERAE MUSTARD FAMILY

A large and distinctive family with flowers normally with 4 sepals, 4 petals, 6 stamens and a superior ovary with two cells. All our plants are herbaceous and the majority are common introduced weeds. Many members commonly have flowers and developing fruits on the plant at the same time.

a. Flowers white, creamy-white, greenish or purplish.
b. Fruit transversely divided into two cells; plants fleshy, found only on sea-shores (Fig. 78, c). 11. *Cakile*
b. Fruit longitudinally divided into two cells.
c. Fruit short, less than 4 times as long as wide.
d. Fruit flattened parallel to the partition.
Plant low; leaves toothed; stems and pods green, almost smooth; petals not lobed; rare native plants. 1. *Draba*
Plants much branched and higher; leaves entire; stem and pods whitish-hairy; petals deeply 2-lobed; weed of sandy soil. 2. *Berteroa*
d. Fruit flattened at right angles to the narrow partition or nearly round or terete.
e. Leaves deeply and irregularly pinnately lobed.
Fruit two nutlets placed side by side (Fig. 77, e). 6. *Coronopus*
Fruit wedge- or purse-shaped (Fig. 77, c). 8. *Capsella*
e. Leaves entire or merely toothed.
f. Fruit roundish in outline, flat, often with a margin extending at the tip.
g. Fruit 10-12 mm wide; plants rarely branched (Fig. 77, a). 3. *Thlaspi*
g. Fruit 2-4 mm wide; plant usually much branched at the apex.

Fruits round to oval, notched at the summit, readily dehiscing (Fig. 77, b). 4. *Lepidium*

Fruits heart-shaped, pointed at the summit with a prominent style, indehiscent or nearly so; perennial with rhizomes; stem-leaves sagittate-clasping. 5. *Cardaria*

f. Fruit orbicular or oblong-cylindrical.

h. Fruit perfectly orbicular; leaves widely clasping at the base (Fig. 77, d). 10. *Neslia*

h. Fruits oval or oblong in outline; leaves linear or wide, not clasping at the base.

i. Plants found on sandy or gravelly lake-bottoms, 2-8 cm high; leaves basal and thread-like (Fig. 78, a). 7. *Subularia*

i. Plants growing on dry land; leaves flat or lobed.

j. Leaves clasping, not toothed. 9. *Camelina*

j. Leaves not clasping, toothed, 15-30 cm long at the base of the plant. 23. *Armoracia*

c. Fruits 4 to many times as long as wide.

k. Stem-leaves 2, opposite, each with 3 leaflets; woodland plants (Fig. 80, b). 25. *Dentaria*

k. Stem-leaves many, entire or pinnately-cleft.

l. Petals 15-20 mm long, purplish or rarely white; leaves not divided, 8-13 cm long; seeds in one row in each cell. 19. *Hesperis*

l. Petals very small, or if 12 mm long then the leaves pinnately-compound.

m. Leaves lanceolate, finely toothed or entire. 27. *Arabis*

m. Leaves all finely pinnately-lobed.

n. Stems often floating on or in water, much branched, leafy; pods terete and curved; seeds in 2 rows in each side or cell (Fig. 78, f). 22. *Nasturtium*

n. Stems erect, unbranched or branched only near the top, the leaves chiefly basal; pods straight, flattened, the seeds in 1 row in each cell (Figs. 79, e; 80, a). 26. *Cardamine*

a. Flowers yellow or creamy-yellow.

o. Fruit not more than 3 times as long as wide, less than 6 mm long.

p. Leaves not toothed, usually clasping.

Fruit ovate, smooth. 9. *Camelina*

Fruit globose, roughened (Fig. 77, d). 10. *Neslia*

p. Leaves pinnately lobed or finely divided.

Fruit two nutlets placed side by side, the surface rough; leaves finely divided; rare (Fig. 77, e). 6. *Coronopus*

Fruit not double, oblong; lower leaves with wide lobes.

Fruits with wall thin and dehiscent, oblong, the surface smooth; common weeds (Fig. 80, c). 21. *Rorippa*

Fruits indehiscent, tapering to a beak, the surface coarsely warty, 7-10 mm long. 19. *Bunias*

o. Fruit 4 to many times as long as wide.

q. Fruits not opening, the wall fleshy and becoming hard, forming many 1-seeded sections; sepals erect and appressed to the petals (Fig. 78, d). 12. *Raphanus*

q. Fruits splitting when ripe into 2 longitudinal halves.

r. Seeds in two rows in each side or cell; rare. 15. *Diplotaxis*

r. Seeds in one row in each cell.

s. Leaves pinnate, or more or less pinnately-lobed.

t. Flowering racemes with leafy bracts; leaves not clasping; pedicels 5 mm long or longer, with the fruit spreading. 14. *Erucastrum*

t. Flowering racemes without bracts.
u. Fruits closely appressed to the stem; flowers 3 mm wide (Fig. 79, a). 17. *Sisymbrium*
u. Fruits not closely appressed, or if appearing so then with the flowers much larger.
v. Fruits extremely long and slender, not thicker than their pedicels (Fig. 79, b). 17. *Sisymbrium*
v. Fruits wider than the diameter of their pedicels.
w. Leaves extremely finely divided; pods long, slender and curved; plants with 2-pronged or stellate hairs. 18. *Descurainia*
w. Leaves widely lobed or pinnate; plants with simple hairs, or glabrous.
x. Leaves thin, often hairy, with toothed lobes; flowering late June to Nov.; beak of the fruit 8-15 mm long; sepals spreading in flower (Fig. 78, c). 13. *Brassica*
x. Leaves mostly glossy and smooth above with mostly rounded lobes; flowering May and early June; beak of fruit less than 4 mm long (Fig. 79, d). 24. *Barbarea*
s. Leaves entire or merely toothed.
y. Leaves smooth and glabrous, sagittate-clasping at the base, the edges with no teeth. 16. *Conringia*
y. Leaves not sagittate-clasping at the base, dull, often toothed.
z. Leaves more than 1.5 cm wide, oval, coarsely toothed (Fig. 78, c); plants with simple hairs. 13. *Brassica*
z. Leaves linear or lanceolate, rarely more than 1.5 cm wide (Fig. 79, c); plants with 2-pronged or stellate hairs. 20. *Erysimum*

1. DRABA L.

Native low herbs of northern regions, ours with basal rosettes of leaves and small erect racemes of white flowers.

a. Lower part of the stem and the basal leaves, especially when young, with numerous simple and forking, occasionally a few stellate, long hairs; fruits 7-9 mm long with pedicels 1-5 mm long. 1. *D. norvegica*
a. Lower part of the stem and the basal leaves closely and minutely stellate-pubescent.
b. Fruits strongly flattened, often twisted, 7-12 mm long and 1/3 to 1/4 as wide; petals 4-6 mm long. 2. *D. hirta*
b. Fruits plump, 4-6.5 mm long and 1/2 as wide; petals about 3 mm long. *D. hirta* var. *pycnosperma*

1. D. norvegica Gunn.

First found by Macoun in crevices of rocks, Big Intervale, Margaree, C.B. A second station for Inverness Co. was reported by Smith and Schofield (1952): locally abundant on dry exposed shelves of limestone cliffs, Big Southwest Brook. The latter collection has the racemes

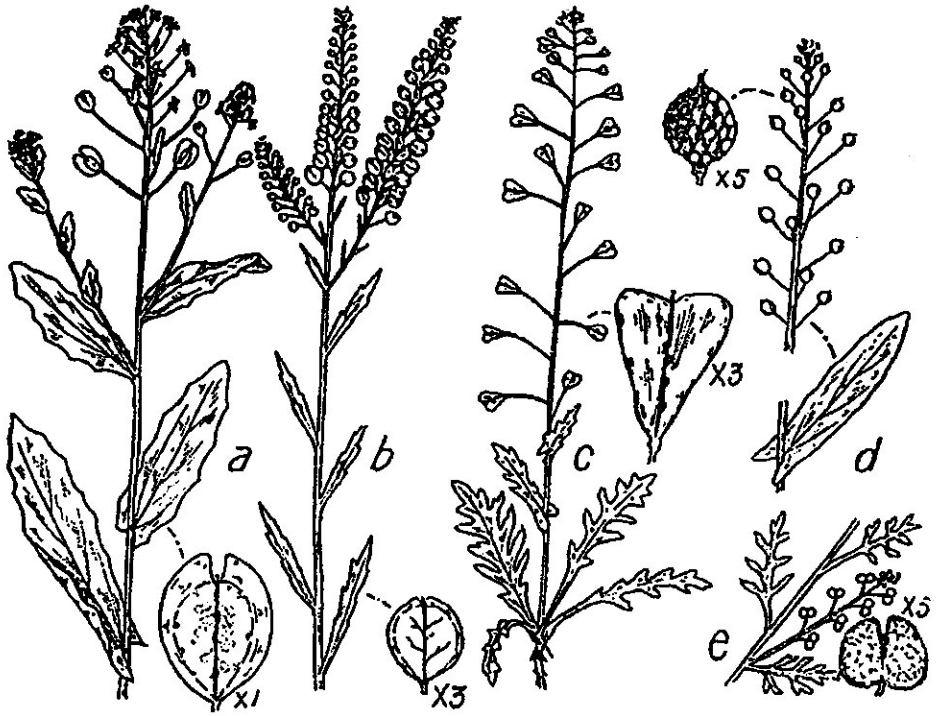


Fig. 77.—**Thlaspi**: (a) plant x ½. — **Lepidium**: (b) *L. densiflorum* x ½. — **Capsella**: (c) small plant x ½. — **Neslia**: (d) leaf and inflorescence x ½. — **Coronopus**: (e) *C. didymus*, small part of plant x ½.

rather open, the fruits narrow and only about 1.5 mm wide, and the leaves narrowly lanceolate. This is typical of var. **clivicola** (Fern.) Boivin, a plant also known from the Shickshock Mt. of e. Que.

Northern Canada and Eu. south to N.S. and Que.

2. **D. hirta** L. Map 295.

Local and sometimes abundant around the head of the Bay of Fundy and in eastern and northern C.B. in crevices of high cliff-ledges and on talus slopes: coniferous slope of Cape Blomidon; relatively common on the cliffs of Isle Haute (Schofield, 1955); rare on cliff crevices and on exposed cliff top at Cape d'Or, small moist rock outcrop east of Refugee Cove, and abundant on a high cliff at New Prospect, in Cumberland Co. It is rather characteristic of cliff-ledges and talus slopes in northern C.B., as at Lockhart Brook, Salmon River, at Indian Brook and at Burnt Mt., Gray Glen (Smith and Erskine, 1954).

The plants of N.S. are variable and seem to have combinations of the characters of *D. glabella* Pursh and *D. arabisans* Michx. The fruits are often rather short and not twisted; and occasionally the stem-leaves are rounded at the base and rather wide. In its wider sense *D. hirta* ranges from Nfld. to Alaska south to northern N.Y.; Eurasia.

Var. **pycnosperma** (Fern. & Knowlt.) Boivin is found at only one location in the Province: Victoria Co., locally abundant and diseased, dry cliff ledges, Lockhart Brook, Salmon R. (Smith and Erskine, 1954).

Northeastern Nfld. and Gaspé Co., Que.; N.S.

2. BERTEROA DC. HOARY ALYSSUM

1. **B. incana** (L.) DC.

Local; abundant near Aylesford, Kings Co., and locally spreading in the same county on the sandy soils. This is an aggressive weed on light soils and in some fields it is a troublesome plant. Very local 20 years ago but probably destined to spread throughout the Valley.

Naturalized from Eu.; N.S. to B.C. south to W. Va.

3. THLASPI L.

1. **T. arvense** L. Fig. 77, a. PENNY-CRESS, STINKWEED

Introduced and scattered mostly about dwellings, along roadsides and in waste places about towns or along railroads. It seems to be introduced mostly in western grain or feed and is invariably seen about chicken-runs. It does not seem to persist although it is sometimes found in oat fields. July-Sept.

Naturalized from Eu.; widely distributed in N. Amer.

4. LEPIDIUM L. PEPPERGRASS

Annual or biennial, weedy plants with numerous racemes of insignificant white flowers and flat, rounded fruits. See Mulligan (1961-a).

a. Stem-leaves sessile, cordate clasping at the base; plant densely short pubescent. 1. *L. campestre*

a. Stem-leaves tapering to the base, not clasping.

b. Fruits 5-7 mm long, on thick erect pedicels, widely winged around both sides; leaves generally all narrowly pinnately-lobed; stamens 6. 2. *L. sativum*

b. Fruits 2-3.5 mm long, on spreading pedicels; stamens reduced to 2, or rarely 4.

c. Petals present, up to 2 mm long, equalling or exceeding the sepals; the radicle of the seed bent back along the edges of the cotyledons; fruit glabrous. 3. *L. virginicum*

c. Petals absent or shorter than the sepals; the radicle in the seed bent back along the flat side of one of the cotyledons.

d. Lower leaves bi-pinnately lobed, the upper stem-leaves obtuse or rounded at the tip; fruits entirely wingless, narrowed to the tip so as to appear slightly elliptic, glabrous. 4. *L. ruderale*

d. Lower leaves coarsely toothed to lobed, the upper stem-leaves acute at the tip; fruits strongly rounded at the tip, and slightly winged above. 5. *L. densiflorum*

Fig. 78.—**Subularia**: (a) whole plant x 1. — **Brassica**: (b) *B. nigra*, fruits x 1, (c) *B. Kaber* x ½. — **Raphanus**: (d) part of plant x ½. — **Cakile**: (e) branch x ½.— **Nasturtium**: (*f*) branch x ½.

1. **L. campestre** (L.)R. Br. Map 295. FIELD-PEPPERGRASS

Waste places, roadsides and about towns, scattered now more or less throughout although not yet a common weed.

Introduced from Eu. and widespread in N. Amer.

2. **L. sativum** L. GARDEN CRESS

Occasionally found as a weed in gardens, or persisting where once grown; not spreading to native habitats.

Introduced from Eu., commonly cultivated and as a casual escape.

3. **L. virginicum** L. PEPPERGRASS

Scattered throughout, often becoming a bad weed in lighter soils, where the plant often grows as a biennial. This species and *L. densiflorum* are very similar and the only certain distinction is said to be the

position of the radicle and the cotyledons in the seeds. This can be seen best by making a thin cross-section of the seed with a razor-blade. May-Sept.

Nfld. to S.D. south to Fla.

4. **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.; Nfld. to Sask. south to La.

5. **L. densiflorum** Schrad. Fig. 77, b.

Becoming a common weed, especially on the lighter soils of the Annapolis Valley; scattered by roadsides, towns and railroads elsewhere. May-Sept. This plant is very similar to *L. virginicum* and is probably often confused with it.

N.S. to B.C. southward; probably introduced in N.S.

5. CARDARIA Desv.

1. **C. Draba** (L.) Desv. HOARY CRESS

Roadsides, waste places and ballast; Yarmouth, where it is scarce (Fernald, 1921); occasionally elsewhere, usually about railroads or in waste places. The species introduced into N. Amer. are discussed by Mulligan and Frankton (1962).

Native of central Asia and the Balkans; widely distributed and a bad weed elsewhere.

6. CORONOPUS Trew

Much-branched plants with finely divided leaves and small, roundish nutlet-like fruits in pairs; flowers minute and white.

a. Fruit notched at the summit so that two nutlets are nearly 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. Map 296. Fig. 77, e. SWINE or CARPET-CRESS

Occasional in waste ground, railroad yards and about seaports; rather common in such situations in Digby and Yarmouth Co. Very seldom found far from the sea-shore. May-Aug.

Introduced from Eurasia; Nfld. south to Fla. and Tex.

Fig. 79.—Sisymbrium: (a) *S. officinale* x ½, (b) *S. altissimum*, leaf and fruit x ½. — Erysimum: (c) *E. cheiranthoides* x ½. — Barbarea: (d) whole plant x ¼. — Cardamine: (e) *C. pensylvanica* x ½.

2. **C. procumbens** Gilib.

Rare; infrequently introduced and probably not persisting; known from Pictou where it was first recorded by Lawson (1890-1) as being collected on ballast in 1883. Not recently collected.

Adventive from Eu.; N.S. to Fla.

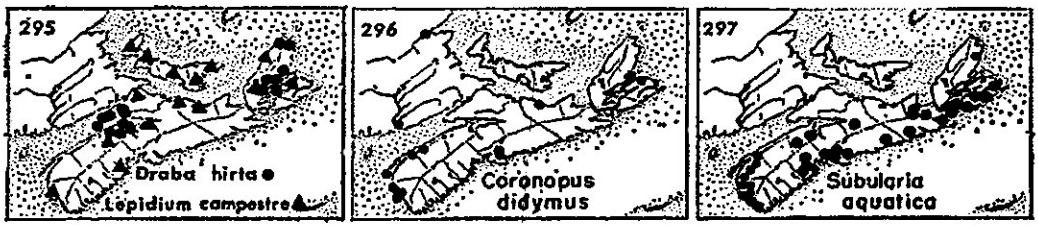
7. SUBULARIA L. AWLWORT

Only two species are known, one around the northern hemisphere and one in central Africa. Our northern species can be divided into two populations, one in Eurasia and one in N. Amer. (Mulligan and Calder, 1964; Boivin, 1966-c).

1. **S. aquatica** L., var. **americana** (Mull. & Calder) Boivin. Fig. 78, a. Map 297. AWLWORT.

Usually submersed and scattered on the gravelly bottoms of lakes and at the margins of slow streams; occasionally in great abundance, forming mats on the bottoms of lakes. It appears to be most common in the extreme southeast and southwest portions of the Province, with scattered stations elsewhere. No collections have been made from the north-central area from Cumberland to eastern Pictou Co.

Greenland to Alaska south to n. N.Y. and Calif.



8. CAPSELLA Medic.

1. **C. Bursa-pastoris** (L.) Medic. Fig. 77, c. SHEPHERD'S-PURSE

Common throughout in gardens, cultivated fields and waste places, and easily recognized by the purse-shaped pods. Very variable; early May to Nov., often growing as a winter annual.

Introduced from Eu.; throughout N. Amer.

9. CAMELINA Crantz FALSE FLAX

Scattered, introduced coarsely-branched plants with small yellow flowers and racemes with the fruits smooth and ovoid or pear-shaped.

a. Leaves and stems sparsely pubescent, with minute stellate hairs and scattered short straight ones; fruits 7-9 mm long. 1. *C. sativa*

a. Leaves and stems roughly pubescent with the simple hairs 1-2 mm long and exceeding the stellate ones; fruits 5-7 mm long. 2. *C. microcarpa*

1. **C. sativa** (L.) Crantz FALSE FLAX

Fields and waste places, very occasionally introduced. Older records were made before *C. microcarpa* was recognized as a separate species, so that the status of this plant in N.S. is dubious; not persisting.

Adventive from Eu.; scattered from N.S. to B.C. south to Va.

2. **C. microcarpa** Andrz.

Occasional in grain fields and as a casual weed around farm-yards and railroad yards; more common than the preceding species but still rarely seen.

Introduced from Eu.; N.S. to B.C. southward, in our area mostly introduced from further west.

10. NESLIA Desv.

1. N. **paniculata** (L.) Desv. Fig. 77, d. BALL-MUSTARD

Scattered in grain fields, about railroad yards and in waste places, probably also mainly introduced in western seed and feed, easily recognized by the spherical, hard fruits.

Introduced from Eu.; Nfld. to B.C. south to Penn., more common westward.

11. CAKILE Hill

1. C. **edentula** (Bigel.) Hook. Fig. 78, e. Map 298. SEA-ROCKET

Common near the coast on sandy beaches, dunes and cliffs, and on shingle beaches; in brackish lakes on Sable I. July-Sept., the flowers pale purple.

Atlantic Coast from Lab. to S.C.; on the Pacific Coast, and a variety about the Great Lakes.

12. RAPHANUS L.

1. R. **Raphanistrum** L. Fig. 78, d. WILD RADISH, CHARLOCK

A common and troublesome weed, especially in the Annapolis Valley, but now scattered more or less throughout. It is still actively spreading and increasing in abundance in many areas although the use of chemical sprays has become general where it is troublesome. Distinguished from wild mustard by its paler flowers and its upright, instead of spreading, sepals. June-Oct.

Introduced from Eu.; Nfld. to Man. south to Ky.

13. BRASSICA L. MUSTARDS

About 50 species, with many in cultivation as highly specialized forms. Cabbage, Brussel Sprouts, Cauliflower, Broccoli, Kohlrabi, Rape, Rutabaga and Turnip are occasionally found flowering. The forms considered here are introduced weeds.

a. Upper stem-leaves tapering to the base, little or not clasping.
  b. Beak of the fruit flattish, about as wide as the pod, often with a seed at the base, each half with 3 veins of about equal size.
    c. Fruiting pedicels about 10 mm long; fruits about 4 mm thick, stiff-hairy, with the beak as long as the body or longer. 1. *B. hirta*
    c. Fruiting pedicels 3-7 mm long; fruits slender, about 2 mm thick, smooth or sparingly hairy, with the beak a third to nearly as long as the body. 2. *B. Kaber*
  b. Beak of the fruit terete, slender, much narrower than the body, without seeds at the base, each half of the fruit with a more-prominent mid-vein.
    d. Fruits 3-7 cm long, 2-3.5 mm thick, spreading, the beak 6-12 mm long; pedicels 7-10 mm long. 3. *B. juncea*

d. Fruits 1-2 cm long, about 1 mm thick, appressed to the axis of the inflorescence, the beak 1.5-3 mm long; pedicels 3-5 mm long. 4. *B. nigra*
a. Upper stem-leaves clasping; plant glabrous. 5. *B. campestris*

1. **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.

2. **B. Kaber** (DC.) L. C. Wheeler, var. **pinnatifida** (Stokes) L. C. Wheeler (also known as *Sinapis arvensis* L.) Fig. 78, c. WILD MUSTARD, CHARLOCK

Occasional in orchards and fields; scattered in towns and about ports. Wild mustard is becoming much more common in grain fields and the clear yellow color of its flowers is in marked contrast to the paler yellow of wild radish. (*B. arvensis* (L.) Ktze). June-Oct.

Widely introduced in N. Amer. from Eu.

3. **B. juncea** (L.) Coss. INDIAN MUSTARD

Becoming a common weed about towns and spreading out into the country, often found about farm buildings where it has presumably been introduced in feed grains. This plant is much larger than the other species, up to 15 dm high, and it is therefore conspicuous when in flower. June-Sept.

Naturalized from Eurasia and rather common from N.S. to Sask. south to Va. and N.Mex.

4. **B. nigra** (L.) Koch Fig. 78, b. BLACK MUSTARD

Common about towns, often a troublesome weed in fields and orchards, but as yet rather local. June-Oct.

Widely introduced from Eurasia; the source of table mustard.

5. **B. campestris** L.

Sparingly naturalized in waste places and occasionally found in considerable amounts in grain fields or in fields the year following grain. This is another weed, as in the case of the wild mustard, which seems to be increasing in abundance. June-Sept.

Naturalized from Eu. and widely distributed, our more recent introductions being from the west.

14. ERUCASTRUM Presl

1. **E. gallicum** (Willd.) O. E. Schulz DOG-MUSTARD

Reported from Coldbrook, Kings Co. by H. Groh in 1933. It is still found only as an occasional weed around railroad yards: Kentville, 1954, by J. and D. Erskine; also found at Charlottetown, P.E.I.

Common in western America and sparingly eastward; introduced from Eu. and a bad weed.

15. DIPLOTAXIS DC.

Two yellow-flowered species with linear fruits; sparingly introduced around ports, probably in ballast.

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, with a short section or stipe next to the fruit. 2. *D. tenuifolia*

1. **D. muralis** (L.) DC. Map 299. SAND-ROCKET

Waste places about the ports, rather rare: ballast heaps and waste ground at Pictou and North Sydney (Macoun); Pictou Landing (Robinson, 1907); Annapolis and Digby. June-Aug.

Nat. from Eu.; N.S. to Penn. and westward.

2. **D. tenuifolia** (L.) DC. WALL-ROCKET

This species was collected long ago at Pictou and at North Sydney in company with the preceding species; found at Pictou by Fernald and St. John in 1914; not recently collected. June-Aug.

Nat. from Eu. into eastern N. Amer.; N.S. to Ont. south to Va.

16. CONRINGIA Link

1. **C. orientalis** (L.) Dumort. HARE'S-EAR-MUSTARD

Casual in railroad yards; Yarmouth through the Annapolis Valley to Cumberland Co.; and probably also elsewhere.

Introduced from Eu.; N.S. to B.C. southward.

17. SISYMBRIUM L. HEDGE-MUSTARD

Much-branched annual with small yellow flowers and long slender fruit.

a. Leaves coarsely divided with wide lobes; fruits 1-2 cm long, the pedicels 1-3 mm long, closely appressed to the stem (Fig. 79, a).
b. Racemes, pedicels and fruits pubescent. 1. *S. officinale*
b. Racemes, pedicels and fruits glabrous. Var. *leiocarpum*
a. Leaves finely divided into linear lobes; fruits 5-10 cm long, the pedicels widely ascending. 2. *S. altissimum*

1. **S. officinale** (L.) Scop. Fig. 79, a. HEDGE-MUSTARD

Common throughout; waste places about towns, scattered along roadsides, about railroad yards, farmyards, etc. Var. **leiocarpum** DC. is found in similar habitats and is perhaps more common. July-Oct.

Introduced and widely distributed in Canada and the U.S.

2. **S. altissimum** L. Fig. 79, b. TUMBLE-MUSTARD

Much larger and coarser than the preceding, up to 1 m high; common in the Annapolis Valley about towns and spreading out into the country; common in towns throughout and locally elsewhere in light soils, often introduced in western feeds and becoming one of our common weeds. July-Aug.

Introduced from Eu.; N.S. to B.C. south to Fla.

18. DESCURAINIA Webb & Berthelot

1. **D. Sophia** (L.) Webb TANSY-MUSTARD

Rare; occasionally seen in waste places as individual plants. It is apparently introduced as seed but does not seem to establish itself as a bad weed. (*Sisymbrium Sophia* L.).

N.S. to B.C. south to Del., Kans. and Calif.

19. HESPERIS L.

1. **H. matronalis** L. ROCKET, DAME'S-VIOLET

Occasional and local along roadsides and about buildings. It is an old-fashioned garden plant, formerly much more commonly grown but still persisting in many places in considerable areas. This large plant usually occurs in masses with flowers of a pale purple color. June-July.

Introduced from Eu.; Nfld. to Ga. westward.

19a. BUNIAS L.

1. **B. orientalis** L.

This tall biennial is rarely adventive in eastern Canada from N.S., southwestern N.B. and southern Que. The flowers are showy, about 6 mm wide and occur in long racemes

Native of southern Eu.; adventive in N. Amer.

20. ERYSIMUM L.

Introduced weeds, with small yellow flowers, elongated fruits and seeds in one row. Our species are more or less pubescent with 2-4-pronged hairs.

a. Annual or winter annual; hairs on the upper surfaces of the leaves mostly 3-parted; petals to 5 mm long; fruit 1-2 cm long on slender spreading pedicels 8 mm long or more. 1. *E. cheiranthoides*

a. Biennial or perennial; petals 6-10 mm long; fruits on erect or appressed pedicels up to 6 mm long.

b. Plant grayish with mostly 2-pronged hairs, to 6 dm high; pedicels thick, 3-9 mm long. 2. *E. inconspicuum*

b. Plant greenish, with mostly 4-pronged hairs, 8-15 dm high; pedicels slender, about 5 mm long for mature fruits. 3. *E. hieracifolium*

1. **E. cheiranthoides** L. Fig. 79, c. WORMSEED-MUSTARD

A very common weed throughout, in cultivated ground and waste places, especially about farm buildings and in gardens. June-Sept.

One farm near Tatamagouche had fields severely infested with biennial plants to 10 dm high. The seeds were apparently introduced in oat seed; and the plants grew very vigorously the following spring. This may be an introduced Asiatic subspecies (see Rossbach, 1958).

Naturalized from Eurasia; throughout Canada and the U.S.

2. **E. inconspicuum** (S. Wats.) MacM.

Rare; gravelly railroad yard, Springhill Junction (Fernald, 1921). Earlier records of *E. parviflorum* probably belong here.

Ont. westward; sparingly introduced eastward.

3. **E. hieraciifolium** L. (see Frankton, 1954).

Scattered collections have been made in eastern Ont. and adjacent Que. since 1941. Common on gypsum, Heatherdale, near Little Narrows, Victoria Co.

Sparingly introduced; widely distributed in Eu. and Asia.

21. RORIPPA Scop.

Much branched, weedy plants with small yellow flowers and short, slightly curved fruits on short pedicels. (Marie-Victorin, 1930; Butters and Abbe, 1940; Fernald, 1940).

a. Plants perennial with long rhizomes; petals exceeding the sepals; fruits 10-15 mm long. 1. *R. sylvestris*

a. Plants annual or biennial with tap roots; petals shorter than the sepals; fruits stouter, mostly 3-8 mm long. 2. *R. islandica*

1. **R. sylvestris** (L.) Bess. CREEPING YELLOW CRESS

This introduced weed promises to become pernicious. It is now known from a number of places in the center of the Province and is persistent once established in fields or gardens: Truro, Wolfville, and common at Port Williams. July-Aug.

Nfld. to N.S. south to N.C. and westward.

2. **R. islandica** (Oeder) Borbas Fig. 80, c. MARSH CRESS

A circumboreal species represented with us by three intergrading types which at times may appear quite different.

a. Upper leaves, as well as the lower, deeply and pinnately lobed; leaves thin and glabrous. Var. *islandica*

a. Upper leaves merely toothed or irregularly and shallowly lobed; plant generally stout with firm leaves.

b. Stem and leaves glabrous or nearly so; fruits commonly 4-6 mm long. Var. *Fernaldiana*

b. Stem and leaves more or less stiff hairy; fruits commonly 3-4 mm long. Var. *hispida*

Both the typical and var. **hispida** (Desv.) Butt. & Abbe are scattered and rather uncommon in ditches, on wet mud, along streams, and in fields and waste places.

Var. **Fernaldiana** Butt. & Abbe is widely introduced in many parts of the Province and is often common. Scattered in Kings and Cumberland Co. and often found about towns elsewhere. It is a bad weed which may at times occupy part of an orchard or a grain field. (Var. *microcarpa* (Regel) Fern.). Forma **reptabunda** Fern., with long creeping and rooting stems with fascicles of mostly simple leaves, was collected in a shallow ditch at Coldbrook, Kings Co., by D. Erskine. July-Sept.

Var. **islandica** is common in Eurasia and ne. N.Amer.; the other two varieties occur throughout the U.S. and Can.

22. NASTURTIUM R. Br.

See Watercress in the New World (Green, 1962).

1. **N. officinale** R. Br. Fig. 78, f. WATERCRESS

Common in slow-moving streams 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 to Inverness and Cheticamp in Inverness Co. Flowers white, July-Sept.

Our common species is a diploid with 32 chromosomes, often called *Rorippa Nasturtium-aquaticum* (L.) Hayek. A tetraploid species, with 64 chromosomes, occurs from Nfld. to Ont. south but has not yet been identified in N.S. This is *R. microphylla* (Boenn.) Hyl., with slender fruits 17-26 mm long, long pedicels and seeds in one row instead of in two. Kensington, P.E.I., large stream at the western outskirts (Mulligan, 1964). X *R. sterilis* Airy-Shaw is the triploid sterile hybrid between the two, with abortive pollen grains and only an occasional seed produced.

Introduced from Eu. and originally cultivated; now widespread in N. Amer.

23. ARMORACIA Gaertn., Mey. & Scherb.

1. **A. rusticana** (Lam.) G. M. & S. HORSERADISH

Infrequent around old gardens in rich soils, propagating from rootstocks; rarely flowering and sterile. June. The large shallow-toothed leaves somewhat resemble those of the dock. (*A. lapathifolium* Gilib.).

Widely introduced; N.S. to B.C.

24. BARBAREA R. Br.

1. **B. vulgaris** R. Br. Fig. 79, d. YELLOW ROCKET

Common in rich soils, on intervales, along rivers and often in orchards in the Annapolis Valley; apparently recently introduced in grain or grass seed and appearing as scattered individuals or sometimes in quantity in seeded fields throughout the Province. Late May-early June. Widely distributed in N.A.

Var. **arcuata** (Opiz) Fries has the pedicels more lax and open and the fruits arcuate-ascending to widely spreading. This is scattered with the species and often more common.

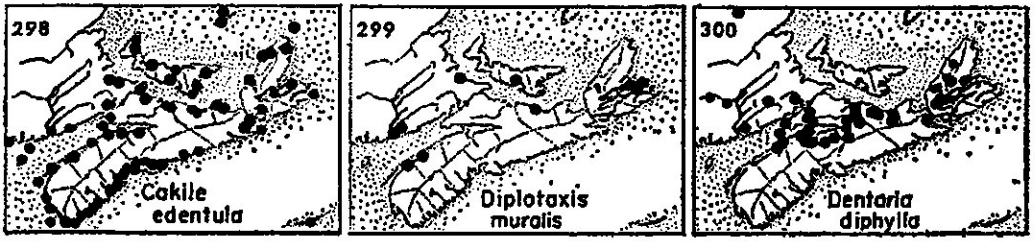
Introduced, as is the species, from Eu. and widely scattered.

25. DENTARIA L.

1. **D. diphylla** Michx. Fig. 80, b. Map 300. TOOTHWORT

Rich moist soil along brooksides and in low, wet or rocky mixed or deciduous woods; general but not abundant from Annapolis Co. eastward to northern C.B., one of our few native plants of this family and rather distinctive. It is found only in the northern area of the Province.

N.S. to Mich. south to S.C.



26. CARDAMINE L.

Flowers white or tinged with purple; with pinnately lobed or compound leaves, and long slender fruits.

a. Flowers large, 10-15 mm wide with petals 7-13 mm wide and tinged with purple; plant perennial. 1. *C. pratensis*

a. Flowers less than 5 mm wide with petals to 3 mm long; plants annual or biennial.

b. Leaves of 2-7 broad segments with the terminal one larger, the lateral leaflets commonly oval and decurrent on the axis of the leaf; moist or wet soils. 2. *C. pensylvanica*

b. Leaves of 5-9 narrow segments, the terminal ones scarcely longer than the lateral; lateral leaflets usually linear and not decurrent; of dry or rocky soils. 3. *C. parviflora*

1. **C. pratensis** L. Fig. 80, a. Map 301. CUCKOO-FLOWER

Common along the Annapolis River system in meadows, moist fields and low areas, now established in many other areas in Kings and Annapolis Co., introduced in grass seed from Eu. over 40 years ago. Scattered elsewhere and occasionally established along roadsides. Introduced from Eu.; Nfld. to N.Y. and N.J. Late May-early June.

Var. **palustris** Wimm. & Grab. is the native form, sparingly scattered in calcareous meadows in central C.B., as in a wet meadow near the Black River bog in central Inverness Co. The flowers are larger, with petals 8-12 mm long, and the flowers are nearly white when open in contrast to the strongly purplish tinge of the flowers of the typical variety. The basal leaves have most of their leaflets short-stalked; and their terminal leaflets are rarely toothed. This variety is found from Lab. to n. B.C. south to N.S., Gaspé, n. N.Y. and Minn.

2. **C. pensylvanica** Muhl. Fig. 79, e. Map 302. BITTER CRESS

Common in swamps, along streams and mucky areas throughout; often with the base rooting in mud under the surface of slow-moving streams. May-July. (*C. scutata* Thunb.).

Lab. to B.C. south to Fla.

3. **C. parviflora** L., var. **arenicola** (Britt.) O. E. Schulz

Scattered and rather local, probably often overlooked, along the Bay of Fundy, in Halifax Co. and north-central C.B.: rocks back of a beach on Brier I., cliff talus on Isle Haute, Cape Blomidon and Cape d'Or; dry rocky beach west of Halifax; boulder slope at Rocky Point and on the Bird I. in Victoria Co. Our plants differ slightly from those of Eu.

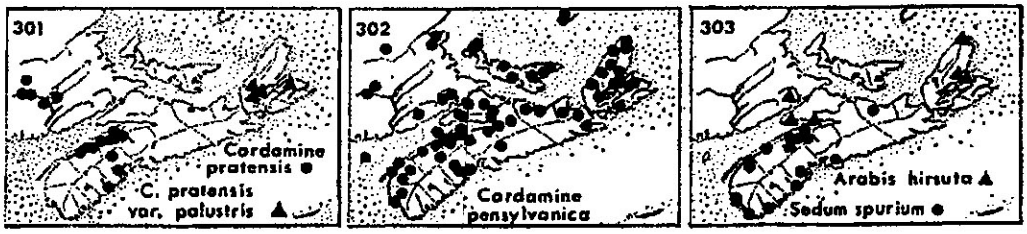
Fla. to Tex. north to N.S., Ont. and Minn.

27. ARABIS L. ROCK-CRESS

Erect unbranched plants with clasping leaves and whitish flowers; the conspicuous feature is the numerous long, slender, stiffly-erect fruits on short pedicels

a. Leaves and stems rough pubescent; fruits very slender, to 1 mm wide, with seeds in one row. 1. *A. hirsuta*

a. Leaves and stems practically glabrous; fruits to 1.5 mm wide, with seeds in two rows. 2. *A. Drummondi*



1. A. **hirsuta** (L.) Scop., var. **pycnocarpa** (M. Hopkins)Rollins Map 303.

Rare and local; Victoria Co.: dry cliff crevices and talus slopes, Indian Brook (Smith and Erskine, 1954); Cumberland Co.: small moist outcrop on rich hardwood slope about one mile east of Refugee Cove; talus, north-west side of Moose Island. At the latter locality it was fairly abundant (Schofield, 1955); on Boularderie Island and at Cape North.

Anticosti west to Yukon, south to N.S., New Eng., Ga. and Calif.

2. A. **Drummondi** Gray Map 304.

Rare and local, at the head of the Bay of Fundy and in northern Cape Breton, usually on dry cliffs and talus slopes but occasionally in richer locations on the lower slopes. Two locations are known from the slopes of Cape Blomidon, Kings Co., on dry slopes; talus slopes on Isle Haute (Schofield, 1955); Big Intervale, Margaree; and in Victoria Co.: dry cliffs and talus, Lockhart Brook, Salmon R.; rare on dry cliffs and talus, Indian Brook; abundant at shaded cliff base, Burnt Mt., Gray Glen (Smith and Erskine, 1954.)

Tall luxuriant plants growing in first year hay in fields at West New Annan, Colchester Co., seem to belong to this species, but their origin is unknown.

Nfld. and Lab. to B.C. south to N.S., New Eng., Ohio and Calif.

51a. RESEDACEAE MIGNONETTE FAMILY

1. RESEDA L.

1. R. **Luteola** L. DYER'S ROCKET

Formerly cultivated as a source of yellow dye, rarely adventive in waste ground, found along roadside in Halifax northeast of Point Pleasant Park by D. S. Erskine. This is a tall plant with small greenish-yellow flowers in a long terminal spike; petals 4, each with a flattened base and one or more projecting appendages or lobes. July.

N.S.; Mass. to Penn.

52. SARRACENIACEAE PITCHER-PLANT FAMILY

Carnivorous plants with the leaves modified to make water-holding pitchers; flowers large, solitary and nodding with the style forming an umbrella-like structure. About 15 species.

1. SARRACENIA L. PITCHER-PLANT

1. **S. purpurea** L. Fig. 80, f. Map 305.

Bogs, bog meadows and sphagnous lake margins throughout; most common in the southwestern counties and in northern C.B.; rather rare in the north-central counties where fewer suitable habitats exist. June 15-July.

Forma **heterophylla** (Eat.)Boivin, with greenish-yellow flowers and foliage, and with no purple veins in the leaves, was reported by Fernald (1922) from Young's L., North Mt., Belle Isle, Annapolis Co. It has been found to be frequent in northern C.B., occasionally outnumbering the typical plants in some of the bogs of the plateau. Occasional intermediate forms are seen in populous colonies of the species. The following two collections represent single plants found among the typical form: Queens Co., swamp, Shelburne River near L. Rossignol; bog, Long L. (Smith and Schofield, 1952).

Forma **plena** D.S. Erskine is a double form with the carpels and stamens transformed into petals. *Sphagnum* bog, Wedgeport, Yarmouth Co., one plant (Klawe, 1955).

Nfld. to Alta. south to Md. and Ill.

53. DROSERACEAE SUNDEW FAMILY

Small insectivorous plants of bogs and wet soils; leaves reddish and in rosettes, with the blades covered with long glandular hairs tipped with dew-drops of clear glandular secretion; flowers small and white, in a slender inflorescence nodding at the tip.

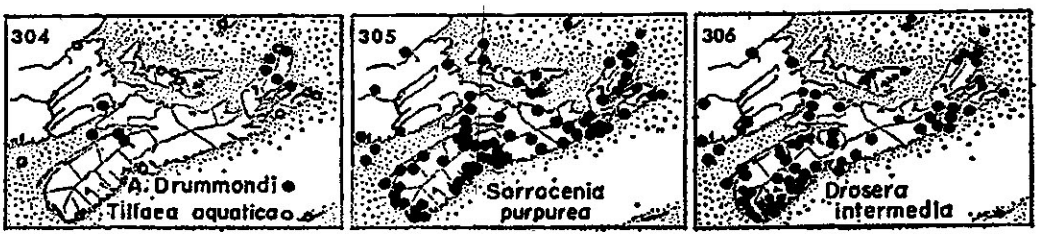
1. DROSERA L. SUNDEW

a. Leaf-blades several times longer than wide; petioles smooth. 1. *D. intermedia*

a. Leaf-blades round, or broader than long; petioles hairy. 2. *D. rotundifolia*

1. **D. intermedia** Hayne Fig. 80, d. Map 306. NARROW-LEAVED SUNDEW

Rather common throughout; in boggy depressions and wet, peaty soil. It is very rare on Sable I., while the next species is abundant. Fernald (1921) records a hybrid of these two species, and intermediate



between them, from a knoll in a wet peaty slough in the barrens at Lower Argyle, Yarmouth Co. July 15 — Aug. 15.

Nfld. south to Fla. and Tex., around the Great Lakes; B.C.; Eurasia.

2. **D. rotundifolia** L. Fig. 80, e. Map 307. ROUND-LEAVED SUNDEW

Abundant throughout; bogs, barrens, lake margins, ditches and swamps. Plants growing in bog water may be strung out with stems several feet long. July 15 - Aug. 15.

Lab. to Alaska south to Fla. and Calif.; Eurasia.

Fig. 80.—Cardamine: (a) *C. pratensis* x ⅓. — 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 ⅓. — Sarracenia: (f) plant x ¼.

54. CRASSULACEAE ORPINE FAMILY

Succulent herbs with numerous small regular flowers that have 3 to 5 pistils in the center, the sepals and petals the same in number, and the stamens the same or twice as many.

a. Plants on mud in or near brackish water, 1-8 cm high; flowers solitary, nearly sessile, greenish white, with the sepals, petals, stamens and pistils 3-4. 1. *Tillaea*

a. Plants of dryish habitats, erect or spreading; flowers in a stalked inflorescence, yellow or rose, with 8-10 stamens. 2. *Sedum*

1. TILLAEA L. PIGMYWEED

See history of *Tillaea aquatica* (*Crassulaceae*) in Canada and Alaska (Cody, 1954).

1. **T. aquatica** L. Map 304.

Restricted to brackish muddy shores or sand flats near the coast; forming pure mats on the wet borders of the fresh-water ponds on Sable I.; scattered along the Atlantic Coast. Shelburne Co.: sand flats back of the beach at Villagedale (Fernald, 1921); near Peggy's Cove, Halifax Co.; Richmond Co.: abundant on flat area near brackish pond, Point Michaud; C.B. Co.: muddy pond behind beach, Catalone (Erskine, D.S., 1951), sandy edge of pond, N.W. Cove, Scatari I. (Smith and Schofield, 1952).

Locally near the coast from Que. and Nfld. to Md. and southward; Pacific Coast; Eu. and N. Africa.

2. SEDUM L. STONECROP

About 500 species, many of which are grown in rock gardens.

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; weedy.

c. Stem-leaves opposite or whorled; plants decumbent with the flowering branches ascending, forming large patches. 2. *S. spurium*

c. Stem-leaves alternate or spirally arranged; plants large and erect, in clumps or growing singly. 3. *S. Telephium*

b. Flowers greenish-yellow or turning purplish, with stamens and pistils on separate flowers, the parts in 4's; rocky sea-shores and cliffs. 4. *S. Rosea*

1. **S. acre** L. Fig. 81, b. MOSSY STONECROP

Occasional on ledgy roadsides or roadside banks in the southwestern counties and scattered east to Kings and Halifax Co.; elsewhere a persistent garden flower or roadside escape, sometimes rather weedy. July.

Naturalized from Eu.; N.S. to B.C. south to Va.

2. **S. spurium** Bieb. Map 303.

Spreading to rocky or gravelly roadsides at many points, Yarmouth to Shelburne and Kings Co.; local east to Pictou. It usually grows in large patches with the matted, prostrate stems on the surface of the ground. A garden escape that is persistent and sometimes rapidly spreading. July. (*S. stoloniferum* Gmel.).

Introduced from Asia; local from N.S. to N.Y. and Penn.

3. **S. Telephium** L. Fig. 81, c. LIVE-FOREVER

Scattered throughout; moist areas, often at the edges of thickets or in shady places with considerable humus in the soil. Aug. - Sept. (Including *S. purpureum* Tausch).

Introduced from Eu.; Nfld. to Minn. south to Penn.; B.C.

Fig. 81.—**Sedum**: (a) flower x 3, (b) *S. acre* x ½, (c) *S. Telephium*, top of plant x ½, (d) *S. roseum*, leaves x ½. — **Mitella**: (e) plant x ½. — **Chrysosplenium**: (f) branches x ½. — **Tiarella**: (g) plant x ½.

4. **S. Rosea** (L.) Scop. Fig. 81, d. Map 308. ROSE-ROOT

Crevices of rocky cliffs on the colder parts of the shore-line; scattered along the Bay of Fundy and at Cape d'Or; rare on the Atlantic Coast; common on cliffs in northern C.B. In the Cobequids it is occasionally found on dripping cliffs or next to waterfalls several miles back from the coast. Late June. (*S. roseum* (L.) Scop.).

Arctic Regions south to the coast of Me.; locally inland.

55. SAXIFRAGACEAE SAXIFRAGE FAMILY

Delicate herbs or shrubs; with sepals and petals in 4's or 5's, the stamens the same number as the sepals or twice as many, and one pistil or two nearly separate ones. Our native representatives are quite diverse and are placed in three different sub-families.

a. Plants herbaceous; fruit a capsule or follicle.
  b. Leaves mostly in a basal rosette or, in one species, small and alternate; plants erect.
    c. Flowers several to numerous; stamens twice as many as the petals.
      d. Leaves small and crowded, sessile or nearly so; rare plants of cliff-faces or talus slopes. 1. *Saxifraga*
      d. Leaves mostly basal and long-petiolate, pubescent, toothed and with heart-shaped blades.
        e. Leaf blade sharply cut into hard teeth; petals not lobed; capsule unequally valved (Fig. 81, g). 2. *Tiarella*
        e. Leaf bluntly and shallowly toothed, the teeth without a hard sharp point; petals finely divided; capsule equally valved (Fig. 81, e). 3. *Mitella*
    c. Flowers solitary, white; stamens the same number as the petals; leaves in a basal rosette, not toothed, bright glossy green. 5. *Parnassia*
  b. Leaves opposite, scattered, the plant forming dense mats along cool brooks or in moist areas; flowers less than 2 mm wide, petals absent (Fig. 81, f). 4. *Chrysosplenium*
a. Shrubs, our currants and gooseberries; leaves palmately-lobed; fruit a berry; ovary inferior. 6. *Ribes*

1. SAXIFRAGA L. SAXIFRAGE

Small cliff-plants, 1-3 dm high in flower, with delicate flowers in a slender, erect, elongated cyme.

a. Stems elongated, forming loose mats; leaves scattered, to 2 cm long, linear-oblong, not serrate; flowers yellowish, spotted with orange. 1. *S. aizoides*
a. Stems producing a dense, basal rosette with stiff oblong leaves; leaves finely serrate with a lime-encrusted pore at the base of each tooth; flowers white. 2. *S. Aizoon*

1. S. aizoides L.

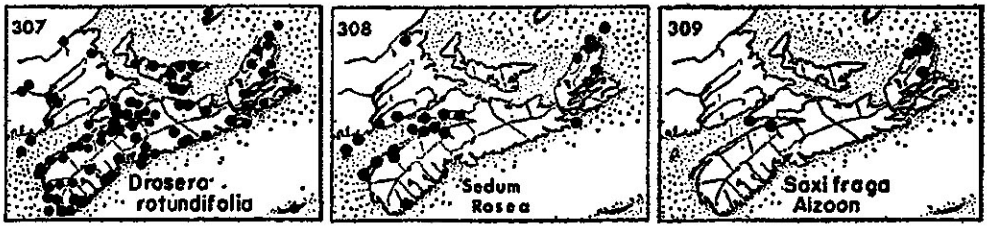
Known from but one place in the Province: Inverness Co., luxuriant on dripping cliffs, Big Southwest Brook (Smith and Schofield, 1952).

Arctic Regions south to C.B., northern Vt. and N.Y.; Alta to B.C.

2. **S. Aizoon** Jacq., var. **neogaea** Butters Map 309

Rare around the head of the Bay of Fundy and in northern C.B. Lawson notes that on one of their collecting trips they found the basalt cliffs at Blomidon hanging with dozens of plants in full bloom. A recent re-collection shows that it is still present there: scattered plants on dry soil, shelves and pockets of lower portion of cliff about 2 miles south of Cape Split (Schofield, 1955). Locally abundant on sheltered cliff shelves at Cape d'Or; Victoria Co.: very rare on shelf of cliff, Gray Glen Brook; Inverness Co.: abundant on dry, sheltered shelves of limestone cliff, Big Southwest Brook (Smith and Schofield, 1952); dry mossy hillside by the side of the Cabot Trail above Cheticamp.

Arctic regions locally south to N.S., Vt., Mich. and Ont.



2. TIARELLA L.

1. **T. cordifolia** L. Fig. 81, g. FALSE MITERWORT

Typical of the richest hardwoods and intervales in Colchester and Pictou Co.; found once at Hunting Point in Kings Co. In many cases the anthers are bright orange instead of yellow. This is forma **allanthera** Vict. & Rousseau (Marie-Victorin and Rousseau, 1940). May 15 - June 15.

N.S. to Minn. south to Ga. and Ark.

3. MITELLA L.

1. **M. nuda** L. Fig. 81, e. Map 310. MITERWORT

Wooded swamps, rich woods, mossy thickets; common from Annapolis Co. to northern C.B., and rare on the Atlantic side on the more acid soils.

Lab. to Alaska south to Penn., Mich. and Mont.

4. CHRYSOSPLENIUM L.

1. **C. americanum** Schwein. Fig. 81, f. Map 311. GOLDEN SAXIFRAGE

Common throughout the northern region from Annapolis to northern C.B.; wet mucky woods, cold springs, over the bottom of small

trickling shady rills; rare in Yarmouth Co. and absent in the acidic areas on the Atlantic side. Early May, the flowers very small and inconspicuous.

N.S. to Minn. south to Ga.

5. PARNASSIA L.

1. P. parviflora DC. Map 315. GRASS-OF-PARNASSUS

Inverness Co.: damp grassy hollows in sand dunes, West Mabou Harbour (Erskine, D.S., 1951); wet tussocks of swamp at Broad Cove. This northern plant, which reaches its southern limits in our area in C.B. and western P.E.I. may be related to *P. palustris* L. of Eu. and nw N. Amer. as variety *parviflora* (DC.) Boivin.

Nfld. south to C.B. and westward to B.C.

6. RIBES L. CURRANTS AND GOOSEBERRIES

The currants and gooseberries are placed in a separate subfamily or in a separate family *Grossulariaceae*. The ovary is inferior with 2 carpels, forming a berry; the calyx-tube or hypanthium is tubular with the 5 sepals larger and more conspicuous than the 5 petals; stamens 5. The family is usually regarded as including the single genus *Ribes* with about 130 species. In addition to the species listed below, the golden currant, *R. aureum* Pursh (*R. odoratum* Wend.) is common as an ornamental; the black currant, *R. nigrum* L., of gardens has the lower surface of the leaves dotted with yellow resinous glands.

a. Flowers in clusters of 1-4; stems with spines at the base of the leaves, and often on the internodes; leaves deeply 3-5-cleft, the terminal lobe rather truncate or rounded with small, blunt teeth. 1. *R. hirtellum*

a. Flowers in hanging racemes; stems spineless, although the young stems of *R. lacustre* are densely bristly; currants.

b. Canes, at least the young ones, densely bristly, as are also the ovaries and fruit; leaves deeply 3-lobed, the terminal lobe with the base less than half its widest width. 2. *R. lacustre*

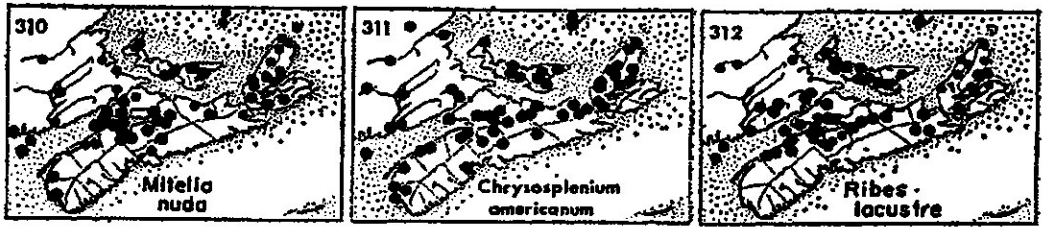
b. Canes and fruit not bristly; terminal lobe of the leaf widest at or near the base and tapering with sharp teeth to the tip.

c. Ovary and fruit glandular-hispid; leaves plainly 5-lobed, with the terminal slightly narrower at the base; plant low, reclining, strong-smelling when bruised. 3. *R. glandulosum*

c. Ovary and fruit not hispid; leaves 3-lobed or obscurely 5-lobed; plant not strong-smelling.

d. Flowers purplish; plant weak and ascending, about 5 dm high; pedicels with pale red glands; leaves with the terminal lobe triangular and as wide or wider than long, widest at the very base. 4. *R. triste*

d. Flowers greenish or greenish-yellow; plants erect and stouter; pedicels mostly smooth or with a few non-reddish glands; terminal lobe of the leaf often longer than wide, the base usually narrower than the middle; cultivated. 5. *R. sativum*



1. **R. hirtellum** Michx. Fig. 82. GOOSEBERRY

Scattered throughout; pastures, edges of woods, along stone walls, in rocky land and even occasionally in swamps and bogs. The plant is variable in leaf-shape and pubescence and Fernald has described two varieties. Typical variety *hirtellum* has the leaves tending to be cuneate at the base and thinly pubescent or becoming glabrous; var. *saxosum* (Hook.)Fern. has the leaves rounded to subcordate at the base and nearly glabrous; while var. *calcicola* Fern. has the leaves tending to be cuneate at the base but are densely and softly pubescent, with the calyx usually pubescent. All intergradations will occur but the last variety is probably more common than the glabrous plants in southwestern N.S. and about the Bay of Fundy. Closely related to *R. oxyacanthoides* L., under which our species can be placed as var. *saxosum* (Hook.)Cov. June 1 - June 15.

Nfld. to Alta. south to Penn.

2. **R. lacustre** (Pers.)Poir. Fig. 82. Map 312. BRISTLY BLACK CURRANT

Rocky or swampy woods, along stream banks and ravines, scattered in hardwood forests. Found only north of a line from Annapolis to Guysborough Co., and throughout P.E.I., presumably in more alkaline locations and never in boggy areas. It prefers a rich moist soil and is frequently common in its habitat. June.

Nfld. to Alaska south to the mts. of Penn. and Colo.

3. **R. glandulosum** Grauer Fig. 82. Map 313. SKUNK-CURRANT

Common to abundant throughout; open rocky woods, in low alluvial soils, or in sphagnous thickets and open coniferous woods in wet soil. This is our most common and widespread species of *Ribes*. (*R. prostratum* L'Her.). May 15 - June 15.

Lab. to B.C. south to New Eng., N.C., Mich. and Minn.

4. **R. triste** Pall. Fig. 82. Map 314. WILD RED CURRANT

Rare and local from northern Digby Co. and Cumberland Co. to northern C.B. where it is rather general in the upper parts of the ravines in north-central Inverness Co. in rich damp woods and alluvial soils and ravines. The plants are usually low with the few branches often reclining in the leaf mold. Variable in respect to the pubescence of the leaves; and including the glabrous var. *albinervium* (Michx.)Fern.

Nfld. to B.C. south to Penn., Wisc. and Oreg.

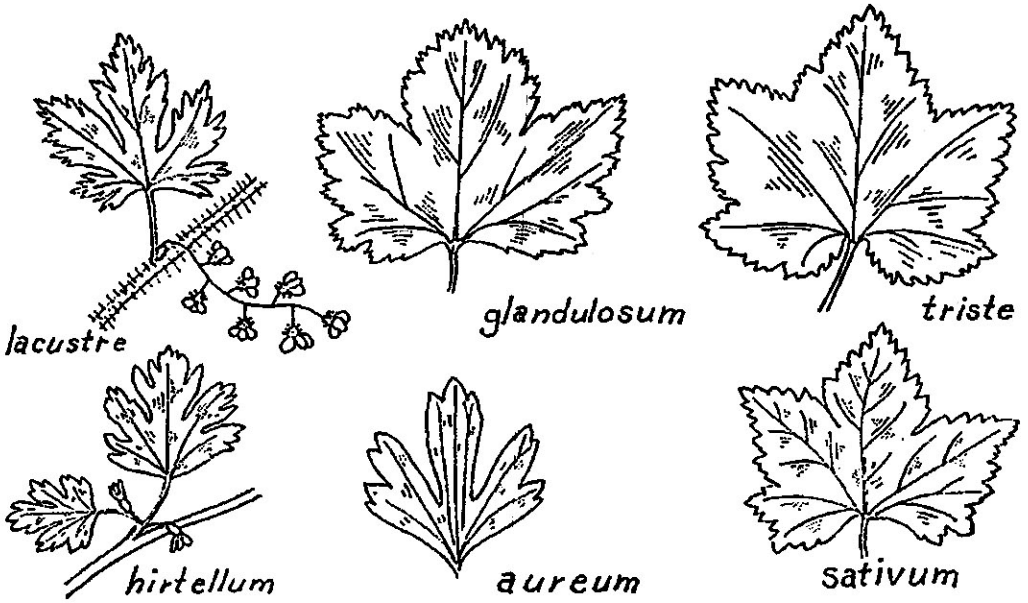


Fig. 82.—Ribes spp. leaves x ½.

5. **R. sativum** Syme Fig. 82. RED CURRANT

Our cultivated red and white currants are considered to be mostly this species, or occasionally hybrids with *R. rubrum* L. Occasionally escaped or persisting in semi-domestic areas. Late May-early June.

Native of Eu.; widely cultivated.

56. HAMAMELIDACEAE WITCH-HAZEL FAMILY

About 20 genera best developed in eastern and tropical Asia; 2 of the 5 species of witch-hazel are native to N. Amer. Our distinctive shrub grows in clumps to 5 m high. The flowers appear in late autumn and have 4 yellowish, linear petals and 4 stamens; the fruit ripens a year later and is a woody capsule.

1. HAMAMELIS L.

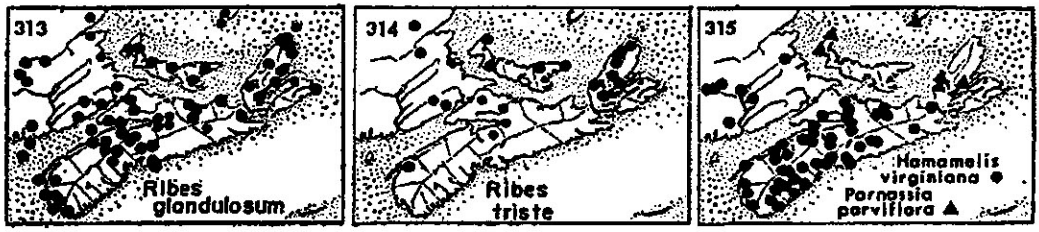
1. **H. virginiana** L. Fig. 83, a. Map 315. WITCH-HAZEL

Rocky woods, thickets and near cliffs, often where there is underground water or seepage; common from Kings and Lunenburg Co. to Colchester Co.; scattered to Yarmouth, becoming rarer eastward and found only to the Strait of Canso; apparently absent also in P.E.I. The clumps of bushes are scattered and never very abundant. Oct.-Nov.

Var. **parvifolia** Nutt. is a smaller-leaved form with the leaves up to 10 cm long, thick and densely stellate-hairy beneath. This was reported

by Fernald from thickets bordering Great Pubnico L. and the east branch of the Tusket R., Quinan, both in Yarmouth Co. (Fernald, 1921). The value of this variety is uncertain.

N.S. to Ont. and Minn. south to Ga. and Tenn.



57. ROSACEAE ROSE FAMILY

This large family includes herbs, shrubs and trees, many of which possess alternate leaves, usually with stipules, 5 separate petals and numerous distinct stamens. The members of this family also differ technically from those of the *Ranunculaceae* in having the petals, sepals and stamens inserted at or near the margin of a saucer- to vase-shaped structure called a hypanthium, and in sometimes having a whorl of tiny bractlets just outside the calyx.

a. Leaves simple, or merely lobed.
  b. Plants herbaceous, small.
    c. Leaves orbicular, shallowly toothed, all basal, to 4 cm wide; flowers solitary, white, and long-peduncled (Fig. 87, c). 13. *Dalibarda*
    c. Leaves shallowly lobed, larger, scattered on the stem.
      d. Flowers solitary, white, over 1 cm wide; fruit an aggregation of drupelets (Fig. 88). 12. *Rubus Chamaemorus*
      d. Flowers numerous, yellowish, to 3 mm wide; fruits dry and enclosed in the calyx (Fig. 87). 14. *Alchemilla*
  b. Plants woody.
    c. Leaves palmately lobed with 3-7 shallow lobes; flowers large, rose-colored. 12. *Rubus odoratus*
    c. Leaves not lobed, or else pinnately so.
      f. Plants with thorns; flowers in corymbs; fruit a berry-like pome, with 1-5 large nutlets. 7. *Crataegus*
      f. Plants without thorns; prickles sometimes present.
        g. Flowers 5 mm wide or less, very numerous in conical or narrow terminal inflorescences; pistils 5-6, partly superior; fruits small, follicles (Fig. 83, b, c). 1. *Spiraea*
        g. Flowers more than 6 mm wide, in umbels, corymbs or racemes; fruit fleshy; pistil 1.
          h. Petals several times longer than broad; ovary inferior, forming a berry-like pome with 10 seeds (Fig. 85, a-c). 6. *Amelanchier*
          h. Petals little if any longer than broad.
            i. Ovary superior in a cup-like calyx, forming a drupe with one stone; petioles with a few glands at the base of the blade; cherries and plums. 18. *Prunus*

i. Ovary inferior, forming a pome with 2 or more seeds in each of the five cells.
j. Flowers 3-7 cm wide; fruit a large fleshy pome; stout trees or shrubs; leaves without dark glands; apples. 3. *Pyrus*
j. Flowers less than 1 cm wide; fruit small, berry-like, black to red; slender low shrubs; leaves with a row of dark glands along the upper side of the midrib (Fig. 83, d). 4. *Aronia*

a. Leaves compound.
k. Plants low and herbaceous.
l. Leaves palmately divided.
m. Fruit fleshy; flowers white; plants with long runners; strawberry (*Rubus pubescens* may key here also). 8. *Fragaria*
m. Fruit dry; flowers yellow, or if white then with the plant without runners and the leaflets with 3 terminal teeth only (Fig. 86). 9. *Potentilla*
l. Leaves pinnately divided; fruits dry and hard.
n. Calyx of both the flowers and the fruit with hooked bristles; flowers yellow in long spike-like racemes (Fig. 87, f). 15. *Agrimonia*
n. Calyx without hooked bristles; flowers not in a slender raceme.
o. Flowers in a dense spike-like head; pistils 1-3, enclosed by the calyx. 16. *Sanguisorba*
o. Flowers in an open inflorescence; pistils numerous, not tightly enclosed.
p. Styles long-plumose or hairy, hooked near the middle, the upper half deciduous in fruit; terminal leaflet several times larger than the others, irregularly lobed or compound (Fig. 87, a-c). 11. *Geum*
p. Styles not plumose nor hairy, nor hooked near the middle; terminal leaflet little if any larger than the lower ones. 9. *Potentilla*
k. Plants woody, at least at the base.
q. Plants trees; flowers small in a flat large cyme; fruits of small berry-like pomes; leaves pinnately compound with toothed leaflets (Fig. 84). 5. *Sorbus*
q. Plants sub-herbaceous or else shrubby.
r. Flowers in dense globular, oval or long cylindrical spike-like heads, small. 16. *Sanguisorba*
r. Flowers in a more diffuse inflorescence.
s. Leaves palmately compound with three leaflets; plants with upright or trailing canes; fruits of numerous black drupelets upon a common receptacle; blackberries. 12. *Rubus*
s. Leaves pinnately compound, often irregularly dissected.
t. Plants erect, with seldom-branched canes; stems usually bristly; fruit of numerous red drupelets; raspberries. 12. *Rubus*
t. Plants usually much branched; fruit not composed of numerous fleshy drupelets.
u. Leaflets 3-7, not toothed, small; flowers yellow, few in each inflorescence; fruits of numerous achenes on a dry receptacle. 9. *Potentilla fruticosa*
u. Leaflets usually more numerous, toothed; flowers not a clear yellow in color; fruit not of numerous exposed achenes.
v. Flowers small and very numerous in an ample diffused inflorescence; prickles or bristles absent.

w. Leaflets irregularly cut or dissected and very uneven in size, the terminal much larger; fruit indehiscent; plant little branched (Fig. 89, b). 10. *Filipendula*

w. Leaflets 13-21, lanceolate, merely toothed and rather even in size; fruits of follicles as in *Spiraea*. 2. *Sorbaria*

v. Flowers few and showy, usually rose-colored; fruit orbicular to elliptical, fleshy, enclosing the base of the pistils and the achenes; prickles usually present. 17. *Rosa*

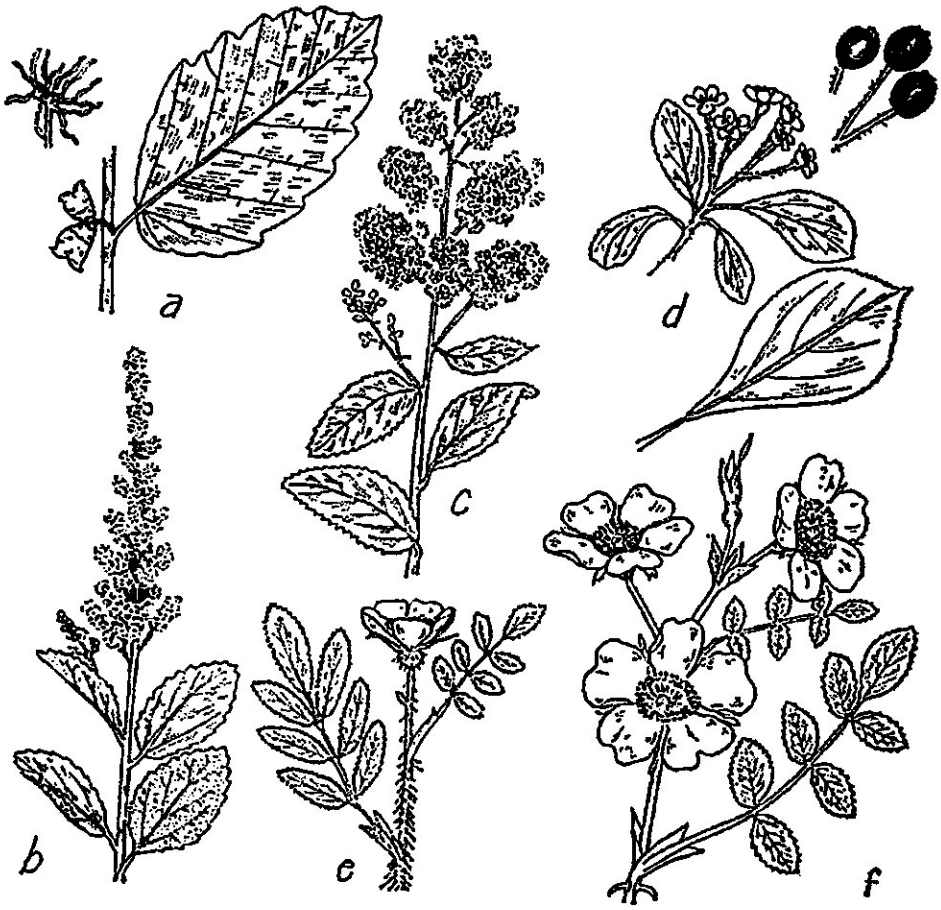


Fig. 83.—Hamamelis: (a) *H. virginiana*, fruiting twig and flowers x ½. — Spiraea: (b) *S. tomentosa* x ⅛, (c) *S. latifolia* x ⅛. — Aronia: (d) *A. prunifolia*, flowering twig, leaf and fruit x ½. — Rosa: (e) *R. nitida*, (f) *R. virginiana*.

1. SPIRAEA L.

About 100 species of attractive flowering shrubs, many used for ornamental plants. The 5 tiny follicles in the center of each tiny flower help to identify the small shrubs, even in the winter season. Our Bridal Wreath is *S. Vanhouttei* (Briot)Zab.

a. Leaves smooth beneath or nearly so; flowers white or pale pinkish; sepals spreading; follicles glabrous. 1. *S. latifolia*
a. Leaves densely rusty-woolly beneath; flowers rose, with reflexed sepals; follicles pubescent. 2. *S. tomentosa*

1. **S. latifolia** (Ait.)Borkh. Fig. 83, c. MEADOWSWEET, HARDHACK

Very common throughout; in wet land, ditches, swamps, meadows and low pastures, especially in wet mucky soils where it replaces the heath plants. July. (*S. alba* DuRoi var. *latifolia* (Ait.)Boivin).

The inflorescence is usually pyramidal but the branches apparently do not develop in cool weather. Such plants have been described as var. *septentrionalis* Fern. from Nfld. and Lab. south to the Mts. of New Eng. and westward. The plant is low, up to 7 dm high, with usually larger flowers densely aggregated into ovoid or cylindrical inflorescences without elongated branches. Abundant near the lake edge, Twin Island L., Ingonish barrens in Victoria Co.; collected by Smith *et al.* in flower July 23, 1951.

Nfld. to Man. south to N.C.

2. **S. tomentosa** L. Fig. 83, b. Map 316. STEEPLE-BUSH

Common in poorly drained and acid soils, low pastures and barrens with clay soils, becoming less common east to sw C.B. It is abundant along the North Shore in areas of heavy or poorly-drained soils. July-Aug.

N.S. to Minn. south to Ga.

2. SORBARIA A. Br.

1. **S. sorbifolia** (L.)A.Br. FALSE SPIRAEA

Formerly much planted as an ornamental shrub, now found about old dwellings and occasionally as an escape along roadsides or in waste ground. First reported by Macoun from along roadsides near Baddeck, C.B. Listed by Cody (1962) from Tupperville, Annapolis Co. and near Chester in Lunenburg Co.

Nfld. south to Penn.; Alta.

3. PYRUS L.

This genus is often enlarged to include the next two genera, since hybrids may occur between them. On the other hand, the Apple is sometimes separated as the genus *Malus*. The Pear is *Pyrus communis* L. Other types of apples may be expected to occur also as escapes in the future as more ornamental crab-apples are grown.

1. **P. Malus** L. APPLE

A common escape in the Annapolis Valley and scattered throughout wherever apples are grown. (*Malus pumila* L.). Late May and early June.

Eu. and Asia; long cultivated.

4. ARONIA Medic. CHOKEBERRY

Common shrubs with cymes of white flowers, best identified by the row of dark glands along the midrib of the upper side of the leaves. The berries are high in pectin and can be used for jellies. Our three species are very similar; the first two are separated mainly by the fruit characteristics and the last two by the amount of pubescence.

a. Twigs, pedicels and calyx and usually the lower surface of the leaves more or less white-woolly at flowering time, some of the tomentum persisting to maturity.
b. Fruits 5-7 mm thick, maturing late in the summer, becoming cherry-red. 1. *A. arbutifolia*
b. Fruit 8-10 mm thick, maturing in mid-summer, becoming purplish black; common throughout. 2. *A. prunifolia*
a. Twigs, leaves and calyx glabrous or nearly so at flowering time, entirely without wool at maturity. 3. *A. melanocarpa*

1. **A. arbutifolia** (L.)Ell. RED CHOKEBERRY

Scattered in Yarmouth Co.; found in thickets at Harper L. in Shelburne Co.; rather common west of Halifax; and scattered north to Lily L. in Kings Co. and about Debert in Colchester Co.; sterile meadows, thickets and near lake shores, often on rocky or sandy ground. June.

Fla. to Tex. and north mainly on the coastal plain to N.S. and s. Ont.

2. **A. prunifolia** (Marsh.)Rehd. Fig. 83, d. Map 317. CHOKEBERRY

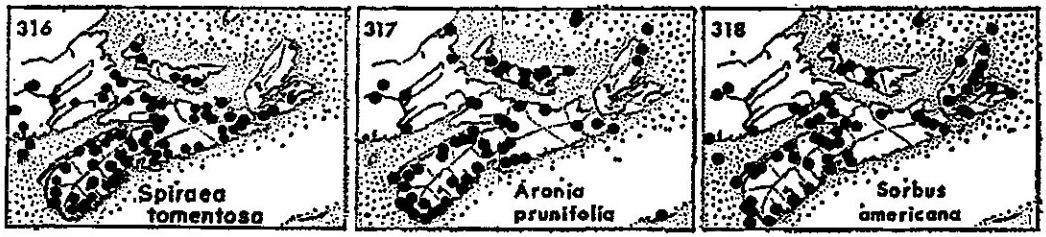
Common throughout the western half of N.S., becoming scattered to northern C.B.; meadows, swamps, barrens, sand plains and even in bogs. It flowers in mid-May and produces dark fruit by the end of July. The leaves vary greatly in pubescence and often the pedicels may be pubescent and the leaves entirely glabrous, or with only a few hairs near the midrib, thus approaching the next species. (*Pyrus floribunda* Lindl.).

Nfld. to Mich. south to Fla.

3. **A. melanocarpa** (Michx.) Ell. BLACK CHOKEBERRY

Rarer than the preceding in the Province, but scattered throughout and more common in the northern and eastern regions. Mid-June.

Nfld. to Mich. south to S.C.



5. SORBUS L. MOUNTAIN-ASH

Small trees with alternate, pinnately compound leaves with 11-17 serrate leaflets. The flowers are very numerous and small in a flat inflorescence. See a synopsis of the North American species of *Sorbus* (Jones, 1939).

a. Winter buds shiny and sparsely hairy; inflorescence sparsely hairy; leaflets 4-9 cm long, acute to long-pointed.
  b. Flowers 5-6 mm wide, with the petals cuneate at the base and exceeding the stamens; fruit 4-6 mm thick; leaflets 3.5-5 times as long as wide, long pointed, each with 50-75 teeth running to or nearly to the base. 1. *S. americana*
  b. Flowers about 10 mm wide, the petals nearly orbicular and shorter than the stamens; fruit 8-10 mm thick; leaflets short-pointed, 2-3 times as long as wide, each with 30-45 teeth which are found chiefly above the middle. 2. *S. decora*
a. Winter buds densely and long white-hairy; branches of the inflorescence, pedicels and calyces whitish-hairy at flowering time; leaflets small, blunt, 3-5 cm long; stamens longer than the petals. 3. *S. Aucuparia*

1. S. americana Marsh. Fig. 84. Map 318. MOUNTAIN-ASH

This is the most common species in N.S. and is frequent from Yarmouth to northern C.B. in open woods, on hillsides and along hedgerows. It flowers in June; and the small fruits ripen in late Aug. or Sept. and persist into the winter.

Nfld. to northern Minn. south to Tenn. and N.C.

2. S. decora (Sarg.)Schneid. Map 319. DOGBERRY

Scattered throughout, less common than the previous species in most areas of the Province and apparently intergrading with it. It is more typical near the shore and is common on the poorly-drained soils and swamps on the tablelands of northern C.B. Even plants that have the leaves typical of this species may not always have the flower characteristics. The clusters of bright large fruits are conspicuous in early autumn.

Hybrids are occasionally found with *Aronia prunifolia:* St. Paul I., frequent (Perry, 1931). This is known as **Sorbaronia Arsenii** (Britt.) Jones.

Greenland to B.C. south to N.Y.

3. **S. Aucuparia** L. Fig. 84. ROWAN

Often planted as an ornamental; and scattered elsewhere as an escape along roadsides, especially in the center of the Province from the Annapolis Valley to Amherst and Antigonish. June. A cultivated hybrid with *Aronia* is sometimes planted and is known as *Sorbaronia hybrida* (Moench)Schneid. This has the appearance of a *Sorbus* but the leaves are irregularly and deeply lobed.

Introduced from Eu.; and widely naturalized.

6. AMELANCHIER Medic. SHADBUSH, WILD PEAR

Showy trees and shrubs with simple leaves and racemes of white flowers with petals several times longer than wide. The fruits are small, edible, red to purplish, berry-like pomes. Common along roadsides and in cut-over areas. The species are difficult to define; and in disturbed areas a multitude of hybrids make satisfactory identification of many collections difficult.

a. Flowers several to many, in racemes; leaves folded when young, mostly round to cordate at the base; fruit mostly globular; ovary-summit rounded.
  b. Tall shrubs or trees, not markedly stoloniferous; leaves acute to acuminate, oblong to oval, with 11-17 pairs of primary veins, and 30-70 teeth on each side.
    c. Young leaves more or less whitish-tomentose, often still folded at the beginning of flowering; ovary-summit usually woolly but sometimes entirely glabrous; lower pedicels 10-15 mm long.
      d. Leaves folded at flowering, densely pubescent on the lower side so as to obscure the veins; ovary-summit often densely woolly. 1. *A. Wiegandii*
      d. Leaves mostly expanded at flowering, with a thin flocculent pubescence that soon disappears; ovary-summit flocculent-pubescent to glabrous; fruit succulent; leaves reddish when young. 2. *A. intermedia*
    c. Young leaves glabrous or merely with a few silky hairs beneath, mostly bronze-purple, soon opening flat; lower pedicels 15-30 mm long, with large flowers. 3. *A. laevis*
  b. Low shrubs, up to 1.5 m high, stoloniferous and forming colonies or patches; leaves oval to obovate, round at the tips or barely acute.
    c. Ovary-summit glabrous or practically so; older leaves thick and shining above; fruits small. 4. *A. lucida*
    c. Ovary-summit tomentose; fruit dark-purple and succulent when ripe.
      f. Leaves densely tomentose beneath when young, dull when older; calyx-tube 3-4 mm wide; erect much-branched shrubs to 1.5 m high; sandy soils, where stoloniferous patches may be found. 5. *A. stolonifera*
      f. Leaves glabrous and green from the first or thinly tomentose when very young; calyx-tube 5 mm wide; low shrubs up to 1 m high, loosely stoloniferous. 6. *A. Fernaldii*
a. Flowers 1-3, in the axils of the leaves; leaves flat when young, nearly glabrous, mostly tapering to the base, pale beneath; fruit ellipsoid-ovoid; ovary-summit woolly, conical. 7. *A. Bartramiana*

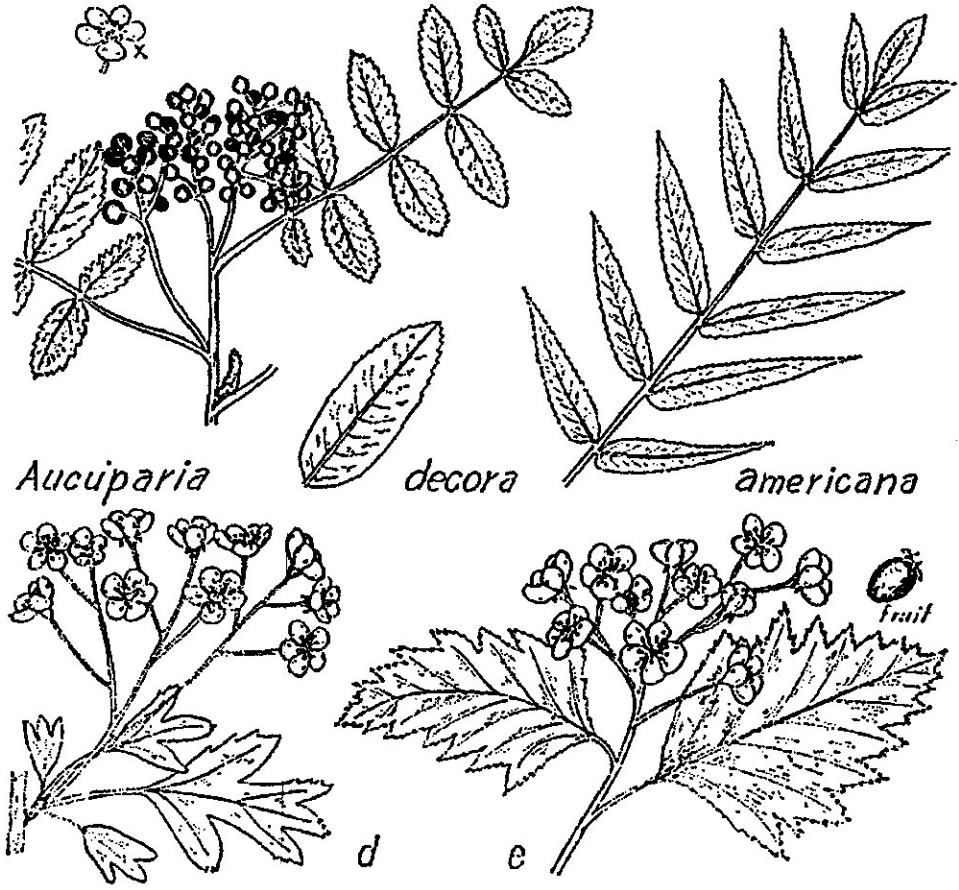


Fig. 84.—**Sorbus:** (a) *S. Aucuparia*, fruiting branch x ½, flower x 1, (b) *S. decora*, leaflet x ½, (c) *S. americana*, leaf x ½. — **Crataegus:** (d) *C. monogyna* x ½, (e) *C. macrosperma* var. *acutiloba*.

1. **A. Wiegandii** Nielsen Fig. 85, b. SHADBUSH, WILD PEAR

Common throughout, extremely variable as to pubescence, length of petals and other characteristics. Reports of *A. canadensis* are placed here. A few collections with glabrous ovaries seem to be mere variations. A number of collections from Kings Co. to northern N.S. were all identified as *A. Wiegandii* by K. M. Wiegand. Hybrids often occur with *A. Bartramiana* and show many intermediate characteristics. This species often forms rather large trees. Late May.

N.S. to Minn. south to N.Y.

2. **A. intermedia** Spach

Scattered to rather common throughout the whole Province, forming bushes up to 5 m high. The leaves have a purplish tinge when young and both leaves and inflorescences have a flocculent pubescence which later disappears. This shrub is common near Pictou and elsewhere in

the same county and these bushes bear very succulent, purplish large fruits. Swamps, heavy soils, hedge-rows and in a variety of habitats.

Nfld. to Minn. south to Va. and N.C.

3. **A. laevis** Wieg. Fig. 85, a. SHADBUSH, BILBERRY

Common throughout; conspicuous in flower by its bronze foliage and its loose racemes of large flowers. This is one of our best and most distinctive species. It also apparently hybridizes with *A. Wiegandii*, although most collections are typical. Open pastures and clearings often contain a multitude of forms that cannot be satisfactorily named. Hybrids with *A. Bartramiana* may show an elongated fruit and the woolly, conical ovary. This hybrid has been named *A. neglecta* Eggleston. A group of these shrubs were found on the north side of the Cornwallis R. just west of Kentville.

Forma **nitida** Wieg. has the leaves thicker, deep green and glossy above. Scattered in many places, although this entity does not seem to be of much importance nor is it easy to identify.

Nfld. to Mich. and Kans. south to Ga. and Ala.

4. **A. lucida** Fern.

Sandy areas, rocky barrens, roadsides and edges of thickets; common from Yarmouth to Halifax and Cumberland Co. In many areas, and especially in Cumberland Co. between Parrsboro and Springhill Junction, this plant forms stoloniferous colonies and it flowers and fruits abundantly when only 3-4 dm high. Larger shrubs have much the appearance of *A. laevis* but the leaves are more oval and the petals are much shorter, while the leaves have only 7-11 pairs of primary veins and with 20-28 teeth along one side of the leaf. The young leaves and inflorescences have abundant pubescence but this soon disappears. This species may have originated from a cross between *A. laevis* and *A. stolonifera*.

Described from N.S. and unknown elsewhere.

5. **A. stolonifera** Wieg. Map 320.

Rather local; scattered in Yarmouth Co. and becoming rather common in thickets and boggy depressions of the sand plains in the Annapolis Valley in western Kings and neighboring Annapolis Co. This species flowers a week or ten days later than the preceding one and the fruits are large, purple and of good quality, whereas those of *A. lucida* are small and reddish.

Nfld. to Me. and Va. and sparingly inland to Minn.

6. **A. Fernaldii** Wieg.

Rare; in eastern N.S. it was first reported from the margin of Ethyl L., St. Paul I. (Perry, 1931). Said to occur mostly in calcareous areas. The identity of the low, semi-stoloniferous, large-fruited bushes found in

the bogs and barrens of eastern N.S. is dubious but these shrubs may be related to this species.

Open barrens, thickets and shores from Nfld. to the lower St. Lawrence south to P.E.I. and eastern N.S.

7. **A. Bartramiana** (Tausch)Roemer Fig. 85, c. Map 320.

Scattered in southern Digby and Yarmouth counties; rather common from Cumberland and Halifax to northern C.B. It is found on acid, poorly-drained soils, bogs and wet thickets, often in shaded locations. Intermediates with the flowers in short racemes, but with the leaves resembling this species, are often found around the edges of bogs, especially in northern C.B.

Lab. to Ont. south to the mts. of New Eng., Penn. and Mich.

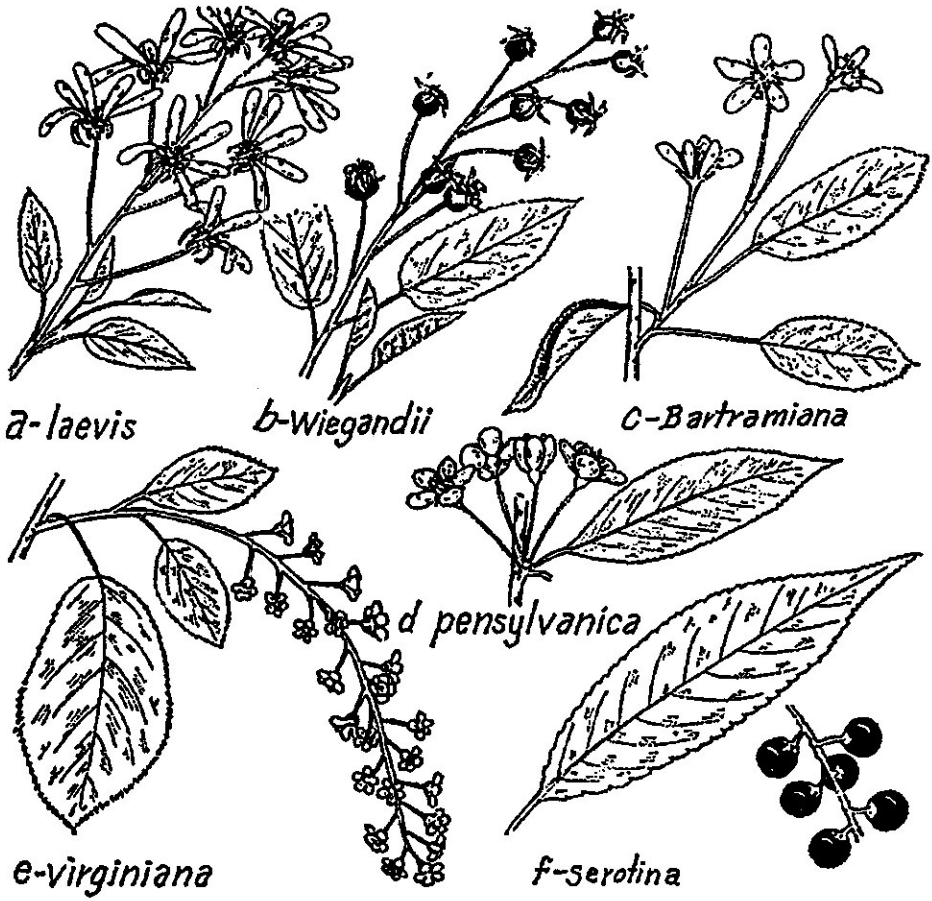
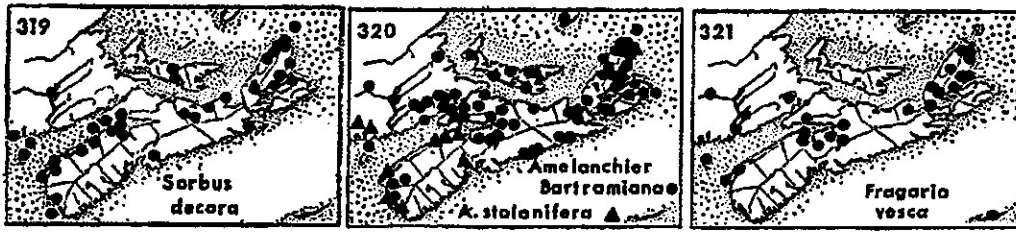


Fig. 85.—Amelanchier spp. (a), (b), (c) x ½. — Prunus: spp. (d), (e), (f) x ½.



7. CRATAEGUS L. HAWTHORNS

Thorny shrubs with showy white flowers in early June; fruits fleshy red berry-like pomes with 1-5 seeds. Our native species are scattered along river-valleys and at the edges of woods near sea-shores or about lakes. The species are quite similar and variable and the group is a most difficult one. Over 1000 species have been described in eastern N.Amer. No complete treatment can yet be given and the genus in eastern N.S. is rather complex. Occasional hybrids may occur and give rise to local strains which may reproduce without fertilization and form a very uniform population over a considerable area. Intermediates sometimes occur and species vary somewhat from one part of their range to another. Consequently it is difficult to make an adequate key; and the best procedure for the student is to make a number of collections for comparison and reference, taking care to obtain flowers and fruit from the same bushes.

a. Leaves deeply cut, the lowest incisions often extending more than half-way to the mid-rib; veins running both to the sinuses and to the points of the lobes; nutlets single (Fig. 84, d); introduced. 1. *C. monogyna*

a. Leaves serrate, dentate, or more or less lobed but not deeply cut; veins running only to the points of the lobes; nutlets 2-5; thorns 5-10 cm long (Fig. 84, c); native species.

b. Leaves definitely and rather regularly lobed; nutlets not pitted on the inner faces.

c. Leaf-blades cuneate or tapering to the base.

d. Leaves cuneate at the base, sometimes with the petiole slightly winged above; flowers mostly under 2 cm wide.

e. Leaves sharply and conspicuously lobed, broadly ovate to sub-orbicular or rhomboid on the terminal shoots, mostly 4-6 cm long although they may be larger on vigorous shoots; sepals glandular-serrate; fruits 1-1.3 cm thick; bush extremely thorny with long slender curved thorns.

f. Petioles and inflorescence more or less villous. 2. *C. chrysocarpa*

f. Petioles and inflorescence glabrous. *C. chrysocarpa* var. *phoenicea*

e. Leaves with small spinulose lobes, ovate to broadly oblong-ovate to nearly orbicular on the terminal shoots, dark green, variable in shape, the lower half often merely finely toothed and tapering or slightly rounded to the petiole.

g. Stamens 5-10, usually less than 10; leaves mostly entire below the middle, oval or nearly orbicular in many cases, shallowly lobed and becoming thick. 5. *C. Brainerdi* var. *Egglestoni*

g. Stamens 8-15, usually 10 or more; leaves lobed to below the middle, mostly elliptic and cuneate at the base, with short stiff hairs on the upper surface at maturity. *C. Brainerdi* var. *scabrida*

d. Leaves mostly elliptical, attenuate to the base with the upper part of the petiole widely winged.
  h. Blades of the floral leaves mostly under 5 cm long; leaves rather thin and sharply lobed with forward-pointing lobes; flowers 1.5-2 cm wide; fruit to 1 cm thick; stamens about 10, yellowish; sepals glandular-serrate. 3. *C. Brunetiana*
  h. Blades of the floral leaves often 6-8 cm long; flowers 2-2.3 cm wide; fruit 1-1.3 cm thick; stamens about 10, with pink anthers; sepals entire. 4. *C. Jonesae*

c. Leaf-blades rounded, squarish, or even slightly cordate at the base, widest below the middle and ovate, sharply lobed and toothed.
  i. Flowering corymbs glabrous or slightly tomentose; stamens reddish; fruit glabrous; leaves rather thin and becoming glabrous.
    j. Corymbs and flowers glabrous; sepals not glandular-serrate, smooth and lanceolate; thorns short and stout, 4-5 cm long.
      k. Leaves rounded to the base, mostly 3-6 cm long and 2-5 cm wide, rather sharply cut. 6. *C. macrosperma*
      k. Leaves larger, to 6 cm wide, truncate or slightly cordate at the base, the lobes broad and with spreading and often slightly recurved tips. *C. macrosperma* var. *acutiloba*
    j. Corymbs and bases of the flowers lightly tomentose; stamens 10-20; sepals glandular-toothed. 7. *C. densiflora*
  i. Flowering corymbs densely tomentose; stamens yellowish; fruit minutely pubescent near the base; leaves widely ovate with a number of sharp, shallow lobes, permanently soft-hairy. 8. *C. submollis*

b. Leaves with oval or ovate blades which are attenuate at the base, tending to be widest about the middle, very slightly or irregularly lobed, the lobes often not much more than larger teeth; flowers 1.3-1.7 cm wide, appearing slightly later than those of other species; nutlets pitted on the inner face; sepals often deeply cut and glandular-toothed. 9. *C. succulenta*

1. **C. monogyna** Jacq. Fig. 84, d. ENGLISH HAWTHORN

Commonly planted and escaping to thickets and roadsides. It is common from Yarmouth throughout the Annapolis Valley and to Truro, becoming rarer eastward. The deeply-cut leaflets, very short thorns and single nutlet separate this species widely from our native forms. Mid-June.

Eurasia; widely introduced.

2. **C. chrysocarpa** Ashe AMERICAN HAWTHORN

This is our most thorny and much-branched shrub, found in thickets and in open ground. The fruit has relatively large seeds and thin flesh and ripens late in the season, becoming dark red. The typical variety is reported only from Pictou Co., but recent collections show this to be the common form from Hants and Cumberland Co. east through Pictou Co. N.S. to N.Y. west to Man. and N.M.

Var. **phoenicea** Palmer differs in its entirely glabrous inflorescence and petioles. This was reported by Palmer from Pictou, Colchester, Hants, Lunenburg, Annapolis, Queens and Yarmouth Co. (Roland, 1944-46). The leaves are usually rather small and pale. Any hawthorn with numerous, very long curving thorns is apt to be this species. N.S. to New Eng. and Penn.

C. Robinsoni Sarg. was described from a few plants found near Loch Broom and Rustico, Pictou Co. This is said to be a distinct shrub with very small flowers and fruit, the flowers being only 0.8-1 cm wide and the fruit 1 cm or less in length. Its rarity and the characters of the leaves, flowers and fruit suggest that it may be a hybrid, possibly between *C. chrysocarpa* and *C. Brainerdi*, the common species in this area. Not collected recently.

3. **C. Brunetiana** Sarg.

The most typical collections of this species are from near the railroad station at Monastery and slightly inland along the roadsides in Antigonish Co. From here eastward along Inverness Co. and up to the Margaree Valley the shrubs seem to be predominantly this species, although the leaves are slightly larger and the flowers more showy. The elliptical, rather deeply cut leaves are characteristic.

Nfld. to Minn. south to N.S. and Me.

4. **C. Jonesae** Sarg.

A shrub or small tree growing along banks of streams or inlets, often near salt water. This is said to be a handsome and distinct species on account of its large flowers and large brightly colored fruit. Reported by Palmer from Pictou, Colchester, Kings, Queens, Yarmouth and Digby Co. The present distribution of this species eastward is unknown since we have had difficulty in separating it from other species and may be confusing it with other forms. Trees from the center of Inverness Co. seem typical.

Que. around the coast to N.B., N.S. and Me.

5. **C. Brainerdi** Sarg.

The typical variety has not been found in N.S. but the species is represented here by the following:

Var. **Egglestoni** (Sarg.)Robins. is usually shrubby with a narrow top of erect or ascending thorny branches. It is only rarely seen, found in thickets and borders of woods in Antigonish, Pictou and Colchester Co.: low pasture at the south end of Lochaber Lake and along the North River near Truro. N.S. to N.Y.

Var. **scabrida** (Sarg.)Egglest. is rather abundant in central N.S. and is the common species in Pictou Co. where it is very common from Pictou up all the rivers. In some cases it forms tall hedges and is the most common species in Pictou and Colchester Co.; scattered westward at least to Lunenburg and Annapolis Co. N.S. and New Eng. west to Mich.

6. **C. macrosperma** Ashe

A shrub or small tree with spreading or ascending branches and slightly scaly bark. The trunk and larger branches are often angular or irregular in cross-section. The small fruit becomes bright red and soft

when fully ripe. It is the most widely distributed thorn in N.S., found in thickets, borders of woods, rocky pastures and along roadsides from Yarmouth Co. eastward through Lunenburg and Halifax Co. to northern C.B. It is the most common form in the Annapolis Valley and is also common in Cumberland Co. around Nappan and Oxford. The thorns are rather short and stout. N.S. to Wisc. south to the mts. of N.C.

Var. **acutiloba** (Sarg.)Egglest (Fig. 84, e) is found in similar locations but is much less common; from Yarmouth Co. eastward to Pictou Co. and Havre Boucher in Antigonish Co. The leaves are larger and tend to be wider at the base and more deeply lobed than those of the typical variety.

Nfld. and Que. to N.Y.

7. **C. densiflora** Sarg.

Many of the shrubs of northern C.B. resemble the previous species but have the inflorescence pubescent and the sepals glandular. This form has been found near Baddeck, in the Margaree Valley, just north of Cheticamp and to Cape North Village. Variations exist in the number and color of the stamens in different locations and this group may be more complex. This name is applied for the present but further study may lead to a more exact identification.

Limestone ridges and hillsides, southern Que.; N.S.

8. **C. submollis** Sarg.

This species is well distinguished by its densely tomentose inflorescence and young leaves and by the highly-flavored, early-ripening edible fruit. The leaves are rather small with a grayish appearance. Palmer reports it from Halifax Co., location unknown. It has also been found near the road junction about a mile west of Brooklyn, Hants Co. on the Windsor road; and it is common in the river valley along the river at Heatherton in Antigonish Co. The leaves are usually so eaten by insects that it is difficult to get a good specimen except early in the summer.

N.S. and Que. south to Mass. and N.Y.

9. **C. succulenta** Link

This thorny shrub is difficult to describe since it is rather variable. It is found infrequently in thickets and along streams at least from Cumberland, Digby and Halifax Co. east to C.B., where it is very common in the Margaree Valley on the rocky land near the river. The flowers are rather small and late in opening; and the small fruit, usually with 2 or 3 nutlets, remains hard and green until late in the season, but becomes bright red and succulent when fully ripe. Different bushes in the Margaree Valley may be quite different in appearance, shape of the leaves and hairiness of the inflorescence. Usually the stamens are red. The leaves are rather thick and glossy and have the veins deeply impressed on the upper side. The plants of the central region were placed in var.

macracantha (Lodd.)Eggiest. This variety often has the sepals very deeply cut or lobed. Some Margaree bushes have the sepals smooth and quite untoothed. This would be var. *integriloba* Sarg., but the species is very variable in this respect here.

N.S. to N.Y. and Penn.

8. FRAGARIA L. STRAWBERRY

About 35 species; freely-runnering plants with three leaflets and distinguished from *Potentilla* by the receptacle becoming fleshy and forming a berry in fruit. See taxonomic studies in the genus Fragaria (Staudt, 1962).

a. Achenes embedded in pits on the mature fruit; inflorescence and fruiting stems usually shorter than the leaves; petals usually 5-7 mm long or longer and sepals appressed; leaves firm, often rugose and with a slight bloom or bluish tinge.
  b. Native plants, slender with the petioles 1-2 mm thick; leaves flat on the upper surface; petals commonly 7-10 mm long and the fruit small. 1. *F. virginiana*
  b. Introduced and cultivated forms, stout with the petioles 2-3 mm thick; leaves with veins and veinlets impressed on the upper side; petals commonly 10-14 mm long; with large fruits. 2. *F. Ananassa*
a. Achenes borne on the unpitted surface of the fruit; inflorescence and fruiting stems usually longer than the leaves; sepals reflexed; leaves thin, often rather folded or plicate, a light green; whole plant very slender. 3. *F. vesca*

1. F. virginiana Duchesne WILD STRAWBERRY

Common throughout; open woodlands, pastures, barrens and fields. May-early June. Nfld. to B.C. south to Ga. and Okla.

Var. **terrae-novae** (Rydb.)Fern. & Wieg. is a common form in exposed places, about the headlands of northern C.B. and scattered east and south. This differs in having the hairs of the peduncles and petioles ascending or appressed. It seems distinct northwards but in the central part of N.S. it grades into the species and both types can often be found in the same patch or field. A collection of this species from Jeffers Brook in Cumberland Co. has the peduncle with small leaves and each branch with a small bracted inflorescence. Plants with small greenish flowers are affected by a virus disease.

Lab. and Gaspé to Ont. south to N.S. and N.Y.

2. F. Ananassa Duchesne CULTIVATED STRAWBERRY

This is considered to be a hybrid of *F. virginiana* and *F. chiloensis*. Commonly grown and persisting or escaping.

3. F. vesca L., var. americana Porter Fig. 86. Map 321.

Scattered from Kings and Cumberland Co. to northern C.B.; occasionally found along the sides of ravines in the Annapolis Valley;

frequent in open woods, ravines or banks in the gypsum areas, often growing in dense patches with the slender plants freely producing runners.

Plants from along the river above White Rock, Kings Co., were grown in the greenhouse at the Research Station, Kentville, and found to have white berries. This is forma **Landonii** Boivin.

The introduced species has the hairs of the petioles and peduncle spreading instead of ascending. This has not been seen except for cultivated plants, but it is said to be introduced from Nfld. to W. Va.

Nfld. to B.C. south to Va. and Mo.

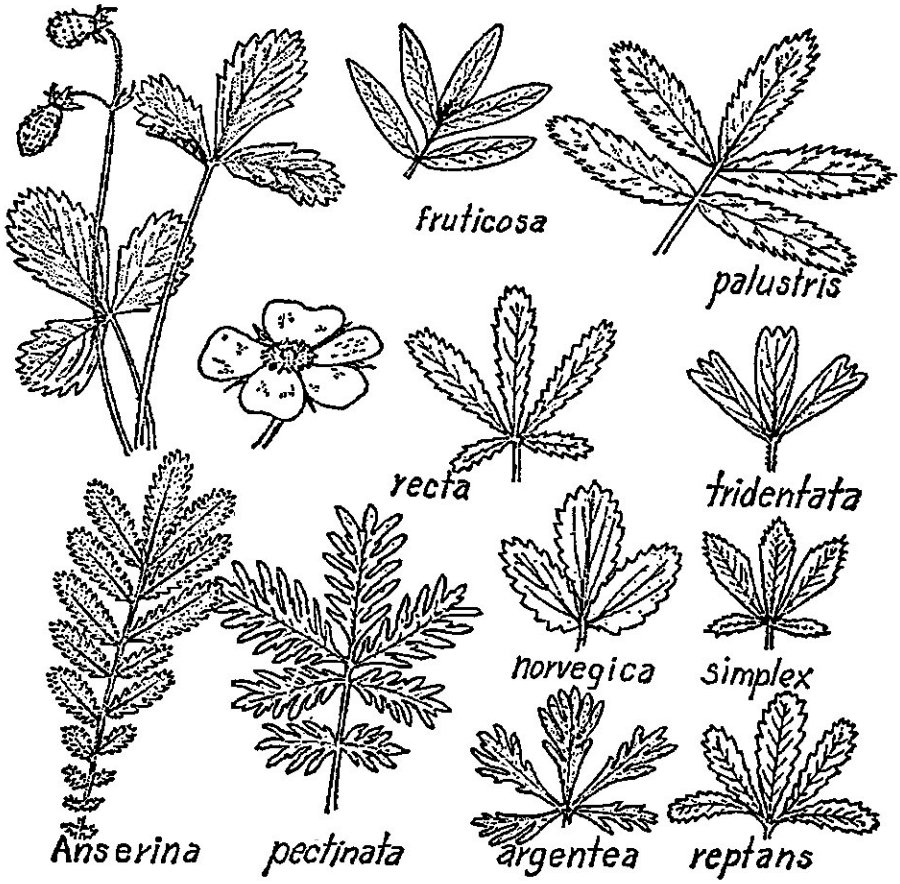


Fig. 86.—**Fragaria**: *F. vesca*, fruiting plant x ½. — **Potentilla** spp. typical flower x 1 and leaves x ½.

9. POTENTILLA L. CINQUEFOIL, FIVE-FINGER

Herbs or rarely shrubs, with compound leaves; about 300 species in the northern hemisphere. The flowers are much like those of the strawberry but the fruit consists of a mass of achenes on a dry receptacle.

a. Stem shrubby and diffusely branched; flowers yellow; leaves pinnately compound with 5-7 leaflets. 1. *P. fruticosa*

a. Stem herbaceous or else very low and only woody at the base.

b. Leaves pinnately compound with the leaflets attached along the short axis or rachis.

c. Flowers several to many in a cyme; leaflets 5-11, with smaller alternating leaflets few or absent.

d. Petals reddish purple, with the sepals and stems more faintly tinged; leaflets mostly 5, toothed; marshes and shallow ponds. 3. *P. palustris*

d. Petals yellow; sepals and stems not reddish tinged; plants of dry locations.

e. Leaflets 5-7, deeply lobed; style about 1 mm long, thickened and glandular at the base. 6. *P. pensylvanica*

e. Leaflets often more than 7, increasing regularly in size towards the apex of the leaf, toothed only; style 1.5-2 mm long, slender throughout. 7. *P. Hippiana*

c. Flowers usually solitary; leaflets numerous, becoming very small towards the base of the leaf and with minute leaflets between the larger ones; salt marshes.

f. Achenes grooved on the back; plants long-trailing, the leaves spreading; leaflets beneath with long straight hairs overlying the dense shiny tomentum. 15. *P. Anserina*

f. Achenes somewhat flattened and rounded on the back, not grooved; plant little-trailing, the leaves erect; leaflets beneath white-tomentose. Var. *Rolandii*

b. Leaves palmately compound with all the leaflets attached at one place.

g. Leaflets 5-9, oblanceolate, prominently toothed; flowers large, sulphur yellow; tall erect perennial. 8. *P. recta*

g. Leaflets 3 or 5.

h. Leaflets 3, or if more then with flower-parts in 4's.

i. Flower-parts in 5's; flowers numerous in a terminal inflorescence.

j. Flowers white; leaflets each with 3 teeth at the tip and wedge-shaped; achenes pubescent. 2. *P. tridentata*

j. Flowers yellow; leaflets oval, toothed around the entire margin. 9. *P. norvegica*

i. Flower-parts in 4's; flowers mostly solitary along the slender trailing stems; leaflets prominently wedge-shaped at the base with 7-8 coarse teeth mostly above the middle. 11. *P. anglica*

h. Leaflets in 5's, finely toothed to near the base.

k. Plants erect or becoming prostrate, not trailing; flowers numerous in a diffuse terminal inflorescence.

l. Leaflets long wedge-shaped at the base with the few teeth mostly on the upper part, the lower surface covered with gray or silvery tangled or matted hairs.

m. Tomentum dense and silvery; leaf-divisions narrow with the margins revolute. 4. *P. argentea*

m. Tomentum light, gray; leaf-divisions and teeth wider with the margins not inrolled. 5. *P. canescens*

l. Leaflets oblanceolate to obovate, with numerous small teeth; hairy on the lower surface but any tangled tomentum very light; plant usually erect. 10. *P. intermedia*

k. Plants long-trailing; flowers solitary in the axils of the leaves; leaves not silvery beneath.

n. Flowers 20-30 mm wide, deep yellow; stems long and trailing, often rooting at the nodes and unbranched; leaves with the pairs of lateral leaflets having their stalks united for a short distance at the base. 12. *P. reptans*

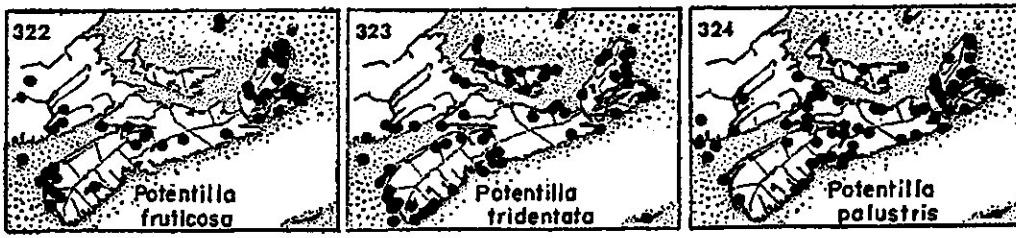
n. Flowers small, 6-16 mm wide; stems erect at first, later procumbent and long trailing, much branched; leaflets with their stalks separate to the petiole.

o. Plant small, the stems thread-like, 0.3-1 mm thick at flowering time; first flower borne in the axil of the leaf from the first well-developed node when the stem is 1-1.5 dm high. 13. *P. canadensis*

o. Plant larger, the trailing stems 1-3 mm thick at the base; first flower borne from the second well-developed node when the plant is 1-4 dm high.

p. Stem, especially when young, long-hairy with spreading or somewhat appressed hairs. 14. *P. simplex*

p. Stem smooth, or with short stiff appressed hairs. *P. simplex* var. *calvescens*



1. P. **fruticosa** L. Fig. 86. Map 322. SHRUBBY CINQUEFOIL

Common in southern Digby and Yamouth Co. in spruce bogs and wet savannahs; often around gypsum or limestone in the center of the Province from Cape d'Or and Hants Co.; and occasionally to Guysborough Co.; scattered throughout C.B. and more common in the northern regions on alkaline soils, in swamps or on gypsum banks and cliff-ledges. The European plants are tetraploid, 2n = 28. The North American ones, including plants from Halifax and Inverness Co., N.S. are diploid, 2n = 14 (Bowden, 1957).

Greenland to Alaska south to Penn., Iowa and Calif.; Eurasia.

2. P. **tridentata** Ait. Fig. 86. Map 323. THREE-TOOTHED CINQUEFOIL

Common around the coast in exposed and rocky situations; found on sandy soil in the center of the Annapolis Valley and about cliffs or bare rock outcrops inland; scattered elsewhere and very variable. Rousseau (1938-a) discusses this variation.

Forma **hirsutifolia** Pease has the leaves hirsute, both above and beneath, while the typical form has the leaves smooth or shining above; gravelly shore at Guysborough. June-Aug.

Lab. to Mackenzie south to New Eng. and the mts. of Ga.

3. P. **palustris** (L.)Scop. Fig. 86. Map 324. MARSH-CINQUEFOIL

Rare in the southwestern counties; scattered in the center of the Province; becoming common northward to Cumberland Co. and east to

C.B. It is found on muddy shores, in swamps above river estuaries, or in undrained ponds. The plants are rather variable. When growing on exsiccated places or towards the end of the summer the leaflets may be densely silky-hairy. This phase is designated forma **subsericea** (Becker) Wolf. Plants with the petioles, peduncles and bractlets densely hairy and glandular and the leaflets hairy, have been called var. *villosa* (Pers.) Lehm, but these occur from N.S. to B.C. and do not appear to have a distinct geographical range. They are probably better known as forma *glandulosa* Gunnarrson. Smaller northern plants ranging south to N.S. have been called var. *parvifolia* (Raf.)Fern. & Long, but it is also doubtful if these deserve varietal rank.

Lab. to Alaska south to N.J., Penn. and Calif.; Eurasia.

4. **P. argentea** L. Fig. 86. SILVERY CINQUEFOIL

This is a common weed in most parts of the Province; in gardens, dry fields, waste ground and along roadsides; scattered throughout but not aggressively spreading.

Introduced from Eu.; widespread in eastern N. Amer.

5. **P. canescens** Bess.

Rather similar in appearance to the preceding species; common on grassy roadside in Victoria Park, Truro. This is a member of a polymorphic group in Europe and it is the same as or is closely related to *P. collina* Wibel of other authors.

Naturalized from Eu.; scattered to Mich. and Penn.

6. **P. pensylvanica** L., var. **litoralis** (Rydb.)Boivin Fig. 86.

Known only from a small, sandy beach north of Cheticamp in Inverness Co. where it has not been recently observed; although Boivin (1952-a) states that a specimen was examined from the Atlantic Coast of N.S. This entity is a variety of the more western *P. pensylvanica* but does not appear sufficiently distinct to be classed as a separate species. (*P. pectinata* Raf.).

Rocky or gravelly soils: Nfld., lower St. Lawrence and Baie des Chaleurs, to the coast of Me. and N.H. and west to Alta.

7. **P. Hippiana** Lehm

A casual adventive from the prairies: in a field, Brooklyn Corner, collected by W.B. Schofield in 1948.

Casual in fields eastward.

8. **P. recta** L. Fig. 86.

This tall, leafy plant is now frequently seen along roadsides, about dwellings and fields throughout. Usually only scattered plants are seen but occasionally it is found in considerable numbers. Two varieties have been introduced. Var. **sulphurea** (Lam. & DC.)Peyr. is the more common and has the middle and lower stem leaves commonly with 7 leaflets. Var. **obscura** (Nestler)Koch has 5 leaflets. June 20-July.

Introduced from Eu.; Nfld. to B.C. south to Tenn. and Kans.

9. **P. norvegica** L. Fig. 86. ROUGH CINQUEFOIL

A common weed in fields, roadsides and gardens, practically always present but rarely in any numbers. This plant is highly variable and may be partly native and partly introduced; the name var. *hirsuta* (Michx.)Lehm has been given to what some regard as the native population.

Widespread in Eurasia and in N.Amer.

10. **P. intermedia** L.

This low or sprawling plant has somewhat the appearance of the preceding species but the lower leaves usually have five leaflets: yard weed at Lowe's Landing in Queens Co.; sprawling in gravel, roadside at Crossroads, Cumberland Co.; scattered throughout central and western P.E.I.

Scattered introductions from Eu.; Nfld. to Mich. south to Va.

11. **P. anglica** Laicharding Map 325.

Along a path in spruce and alder thicket, Lower Argyle, Yarmouth Co.; grassy road through spruce and fir woods, Baddeck (Fernald, 1921). Our collections show it to be scattered throughout the center of C.B. Island. Fernald interprets the status of this plant as being native ranging from southern Labrador and se. Nfld. to C.B. Island and introduced further south in sw. N.S. and Penn. Others consider it to be introduced. (*P. procumbens* Sibth.).

N. Amer., Europe and the Azores.

12. **P. reptans** L. Fig. 86.

Sparingly found in the country and about the wharves in Yarmouth. Adventive and rare.

Adventive from Eu.; Mass. to Ont. and Va.; N.S.

13. **P. canadensis** L. Map 325.

Rare on dryish soil or barren areas; Yarmouth, Shelburne and Point Pleasant Park in Halifax.

Me. to Ont. south to S.C.; sparingly introduced northward

14. **P. simplex** Michx. Fig. 86. CINQUEFOIL, FIVE-FINGER

Rather rare; central N.S. and southern N.B. south to N.C. and Okla. The record for *P. pumila* Poir for Bridgewater belongs here (Fernald).

Var. **calvescens** Fern. is found throughout; roadside banks, on poor or leached soils, pastures, open woods and worn-out fields. This variety probably has little value as all degrees of pubescence may be found.

N.S. to Minn. and Okla. south to S.C.

15. **P. Anserina** L. Fig. 86. SILVERWEED

This plant is found around the whole coast, seashores, damp soil, often at considerable distances from the salt marshes but usually

characteristic of sandy beaches or low areas of dunes where it often forms long stolons and runs freely over the sand; often rather weedy about inlets and ports. The pubescence is variable and forma *sericea* (Hayne)Hayek has the leaflets silvery-silky pubescent on both sides. June-Aug. Nfld. to Alaska south to N.J.; inland about the Great Lakes and westward; Eurasia.

Var. **Rolandii** Boivin (1966-c) is common on the coast, especially on the marshes about the Bay of Fundy; on sand marshes and along shorelines, generally growing in muddy or poorly-drained areas, often in large colonies. It is possible that there are two species involved here for, in N.S. at least, these two plants occupy different habitats and appear quite different. (*P. Egedei* Wormsk., and *P. pacifica* Howell). June-Aug. Nfld. and eastern Que. to Long Island, N.Y.

Var. **lanata** Boivin is a Sable Island plant very similar to the preceding variety but with the apex of the peduncles and the sepals and bracteoles of the flowers densely whitish-woolly.

10. FILIPENDULA Mill.

Coarse perennial herbaceous plants one to two meters high with pinnate leaves and large panicles of small flowers; fruit of 5-7 small indehiscent 1-seeded, often twisted, follicles. There are about ten species with ours all being escapes from cultivation.

a. Leaflets large and few, the terminal one much the largest and palmately lobed; follicles twisted.
  b. Flowers pink; leaves green on both sides; lateral leaflets lobed; plants low and herbaceous. 1. *F. rubra*
  b. Flowers creamy white; leaves white-woolly beneath; lateral leaflets not lobed; plants tall and rather shrubby. 2. *F. Ulmaria*
a. Leaflets of 12 or more pairs, each leaflet about 3 cm long and all similar in shape, sharply toothed; follicles straight; flowers white or pale pink. 3. *F. hexapetala*

1. F. rubra (Hill)Robins. QUEEN-OF-THE-PRAIRIE

Rare; planted as a garden ornamental and occasionally escaping in Yarmouth Co. Late July-Aug.

Native of Penn. and south; now found N.S. to Ont.

2. F. Ulmaria (L.)Maxim. Fig. 89, b. QUEEN-OF-THE-MEADOW

Abundantly naturalized in the southwestern counties and common at least to Pictou Co.; in low areas, around buildings, roadsides and in waste places. Occasionally this species may occur in masses in low neglected meadows or along the edges of fields. Late July-Aug.

Introduced from Eu.; escaped from cultivation Nfld. to Ont.

3. **F. hexapetala** Gilib. DROPWORT

Rare as a garden escape in Yarmouth Co.; introduced from Eu. and Asia.

Nfld. to Ont. south to N.Y.

11. GEUM L. AVENS

This genus comprises about 60 species of perennial plants of cool or temperate regions; with the lower leaves pinnate. Most of our species have the styles hooked or jointed in the middle with the upper part later falling away so the ripe achenes have hooked extensions at their tips. See cytotaxonomic studies of *Geum* (Raynor, 1952).

a. Lower leaves consisting mainly of a large terminal leaflet with only one to several minute leaflets below it; styles straight and not jointed; Brier I. 6. *G. Peckii*

a. Lower leaves with the terminal leaflet deeply divided, or relatively undivided but with numerous smaller leaflets below it; styles hooked in the middle with the upper part deciduous; plants widely distributed.

b. Sepals green, spreading or reflexed; petals white or yellow; upper joint of the style hairy and the lower smooth or nearly so; flowers erect.

c. Terminal segment of the basal leaves much divided, the divisions sharp-pointed and coarsely toothed; stem-leaves sharply toothed and lobed.

d. Petals whitish or greenish; stipules 7-15 mm long; some of the basal leaves usually unlobed or else 3-parted; head of fruits round.

e. Plant slender; lower part of the stem smooth or sparingly hairy with hairs 1 mm long; receptacle of the fruit and the achenes densely bristly; petals exceeding or equalling the sepals, white.

f. Achenes 30-60 in a head, broadly ovate, 2.5-3 mm long; peduncles finely velvety; leaves thin. 1. *G. canadense*

f. Achenes 60-160 in a head, narrower to wedge-shaped, 3-4 mm long; peduncles with longer hairs; leaves firmer. *G. canadense* var. *camporum*

e. Plant stout, bristly-hairy, with hairs 2 mm long; receptacle smooth or nearly so; petals cream-colored, narrow, about half the length of the sepals (Fig. 87, c).

g. Achenes smooth. 2. *G. laciniatum*

g. Achenes bristly near the apex. *G. laciniatum* var. *trichocarpum*

d. Petals bright yellow, about as wide as long, longer than the sepals; stipules 15-40 mm long; leaves all pinnate; head of the fruits obovoid with the receptacle downy; achenes hispid. 3. *G. aleppicum*

c. Terminal segment of the basal leaves much larger than the lateral lobes, heart-shaped at the base, almost round and finely toothed; lower stem-leaves 3-parted with the lobes rounded; petals yellow, longer than the sepals (Fig. 87, b). 4. *G. macrophyllum*

b. Sepals purplish, erect; petals greenish or purplish-cream colored, erect or ascending; upper joint of the style plume-like and the lower long-hairy; flowers nodding; fruits erect (Fig. 87, a). 5. *G. rivale*

1. **G. canadense** Jacq. Map 326. WHITE AVENS

Dry to moist woods, often in rich soil along the intervales from Annapolis to central C.B.; rare in the southwestern counties and very

rare or absent along the Atlantic Coast from Queens Co. to eastern C.B. June 15-July. N.S. to Minn. south to W.Va.

Var. **camporum** (Rydb.)Fern. and Weath. is a common weed around towns, at the edges of woods and along intervales throughout the area of the species.

N.S. to N.D. south to Mass., N.Y. and Ala.

2. **G. laciniatum** Murr. Map 327. Fig. 87, c.

Scattered along the intervales and at the borders of rich woods, generally growing in similar locations to the preceding species: Annapolis and Cumberland Co. east to Pictou Co. and to northern C.B.; not found in western N.S. and very rare on the Atlantic side of the Province. N.S. to Ont. south to Md. and Ind. (*G. virginianum*).

Var. **trichocarpum** Fern. is very rare in the Province and grows in the same habitats; near Windsor and along the Five Islands R. in Colchester Co.

N.S.; Mass. to Minn. south to N.C. and Mo

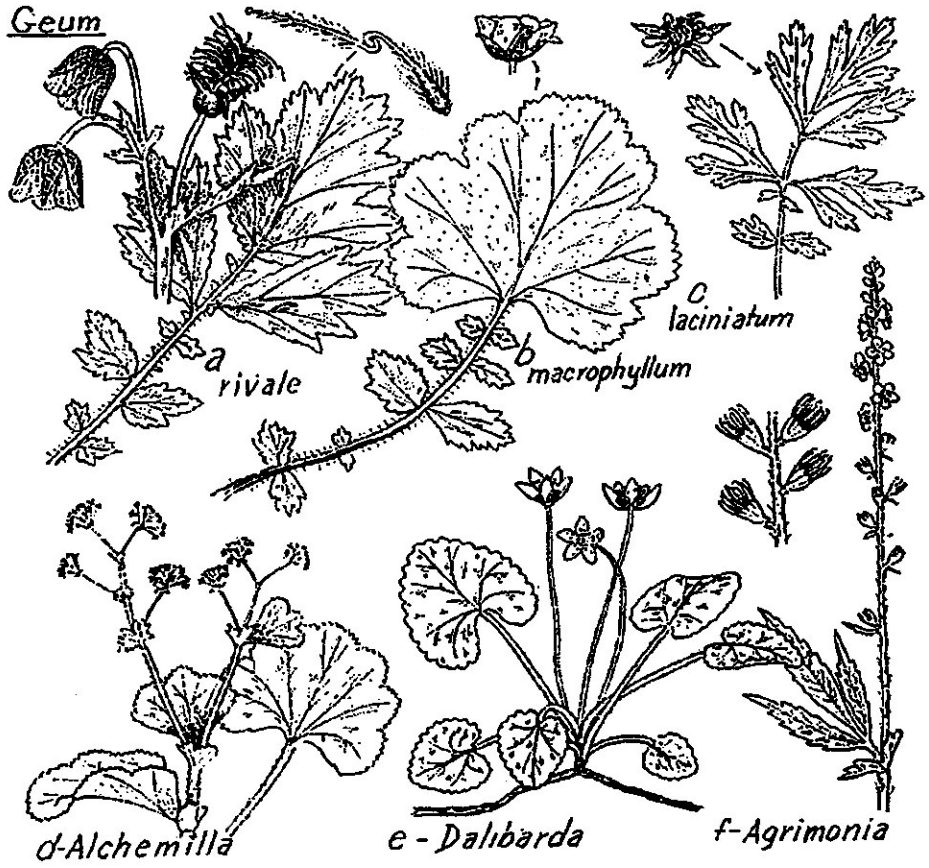


Fig. 87.—Geum: (a) *G. rivale*, leaf and flowers x ½, fruit with hooked style x 3, (b) *G. macrophyllum*, basal leaf and flower x ½. (c) *G. laciniatum*, lower leaf and flower x ½. — **Alchemilla:** (d) *A. xanthochlora*, upper part of plant x ½. — **Dalibarda:** (e) *D. repens* x ½. — **Agrimonia:** (f) *A. striata*, flowers and fruit x ½.

3. **G. aleppicum** Jacq., var. **strictum** (Ait.)Fern. Map 328.

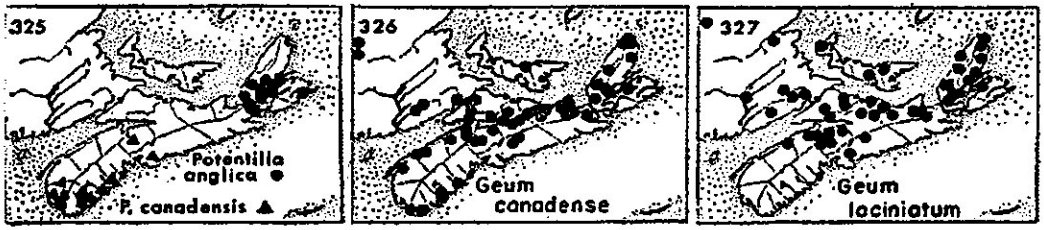
Rather common from Annapolis and Cumberland Co. east to central C.B., rare or absent elsewhere; rich soil, along river banks, waste ground, and occasionally as a weed about buildings. It is scarcely separable from *G. aleppicum* of Eurasia.

N.S. and Que. to B.C. south to Penn.

4. **G. macrophyllum** Willd. Fig. 87, b. Map 329.

Wet ground, damp woods and along streams, usually in shaded areas in rich or mucky soils: Annapolis Co. and Amherst to northern C.B. It is common eastward along the river intervales; and practically absent in the southern side of the Province.

Lab. to Ont. south to N.Y.; Alaska.



5. **G. rivale** L. Fig. 87, a. PURPLE AVENS

Common throughout; meadows, edges of swamps and springy areas. June 20-July 10.

Lab. to B.C. south to Penn.; Eurasia.

6. **G. Peckii** Pursh

Abundant and scattered over an area of several acres in a bog at the roadside and on burned areas between Westport and Big Cove on Brier I. 2n = 42. July-Aug.

This neat plant is found elsewhere only on damp slopes and alpine meadows of the higher mountains of Me. and N.H.; and it is closely related to a variety in the mountains of N.C. and Tenn.

12. RUBUS L. BRAMBLES

This large genus comprises the cloudberry, dewberry, raspberries and blackberries. The flower has many pistils on a conic receptacle and each ovary forms a small succulent drupelet; the aggregate when mature forms the characteristic thimble-like fruit.

The blackberries form a complex group where proper species are almost impossible to define. The forms hybridize with each other; various degrees of polyploidy arise and apomixis exists. Numerous populations may be found in which the members more or less resemble each other. Some 400 have been named and hundreds more may exist.

The only diploid plants found by Aalders and Hall were those typical of *R. hispidus* and *R. allegheniensis*.

While some type of classification is necessary in such a varied group, it is difficult to know how many species have contributed to our populations. Certain species seem to have a wider distribution than others and to possess distinctive characteristics, while others are quite variable. It seems preferable to keep the number low until further work has been carried out.

In collecting *Rubus* the inflorescence, either in flower or fruit, should be taken, along with a middle section of the first-year cane or *primocane* and a piece of the second-year cane or *floricane*. The habit should be noted as prostrate, ascending, mounding, arching or erect.

The key is made for the more or less typical representatives of the species. Many plants will show intermediate characteristics and may be wide variants or hybrids. The types which have been named are mentioned under the species they most closely resemble. Anyone who desires to make a more detailed study of our blackberries should consult the detailed work of Bailey (1941-45), Fernald's treatment in Gray's Manual (1950), Aalders and Hall (1966), and Hodgdon and Steele (1966).

a. Leaves simple, merely 3-5-lobed; prickles absent.
  b. Herbaceous, low to 2 dm high; lobes of the leaf rounded; flowers solitary, white; fruit yellowish. 1. *R. Chamaemorus*
  b. Woody and bush-like, to 1.5 dm high; lobes of the leaf sharp; flower rose-purplish; fruit small, purplish. 2. *R. odoratus*
a. Leaves compound, with 3-7 leaflets.
  c. Plant trailing, essentially herbaceous, unarmed; leaves mostly thin with three leaflets; fruit red, not separating easily from the receptacle; dewberry. 3. *R. pubescens*
  c. Plant trailing or erect, woody, often armed with bristles or prickles.
    d. Leaves pinnately 3-7 lobed; fruit red, easily separating from the receptacle; raspberries.
      e. Corolla 3-4 cm wide; fruit oblong, to 3 cm long; petals large, as broad as long; leaves often with 7 leaflets. 4. *R. illecebrosus*
      e. Corolla smaller with the petals inconspicuous and much narrower than long; leaflets mostly 3, whitish beneath.
        f. Plant glandless; inflorescence with relatively short pedicels; drupelets firmly united in fruit, the remaining core elongated; unripe fruit commonly conic and gray-pubescent. 5. *R. idaeus*
        f. Plant with stalked glands on some or all of its axes; pedicels slender; drupelets easily separating, leaving a short, broad core on the cane; unripe fruit not conic nor pubescent. 6. *R. strigosus*
    d. Leaves palmately divided with 3-5 leaflets; petals showy; fruit black, not easily separating from the receptacle or core; blackberries.
      g. Primocanes with numerous, straight bristles or with fewer straight, acicular prickles which are not broad-based; curved prickles absent.
        h. Plants prostrate or low mounding; leaves usually with 3 leaflets, firm and deep glossy-green, persisting over winter; flowers mostly less than 16 mm wide (Section *Hispidi*). 7. *R. hispidus*