

Fig. 123.—*Epifagus*: (a) *E. virginiana*  $\times \frac{1}{2}$ . — *Orobanche*: (b) *O. uniflora*  $\times \frac{1}{2}$ . — *Plantago*: (c) *P. lanceolata*  $\times \frac{1}{2}$ , (d) *P. juncoides*  $\times \frac{1}{2}$ , flower  $\times 4$ , (e) *P. major*, flower, (f) *P. Rugellii*, flower and fruit, (g) *P. ollganthos*, flower.

### 1. *P. major* L. Fig. 123, e. BROAD-LEAVED PLANTAIN

Very common throughout and very variable as to pubescence; lawns, road-sides, dooryards, in waste places, and not uncommon along shores and in more native locations, apparently partly native and partly introduced. Twelve varieties and numerous subvarieties and forms have been described. *Forma intermedia* (Gilib.) Pilger is glabrous or nearly so with the leaves round-based. Introduced from Eu. and cosmopolitan.

*Var. scopulorum* Fries and Broberg is found on maritime, often brackish shores. The leaves are decumbent or slightly ascending and the scapes are decumbent at the base. Eu.; C.B. and P.E.I. to Del.; James Bay; Wash. to Calif.

2. *P. Rugelii* Dene. Fig. 123, f. RUGEL'S PLANTAIN

Common in the Annapolis Valley, scattered around Truro, apparently rare elsewhere and much less common than the preceding even in the favored habitats. Perennial in lawns, along roadsides and sometimes in fields and pastures.

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

3. *P. juncooides* Lam. Fig. 123, d. Map 478. SEASHORE-PLANTAIN

This may be considered as the N. Amer. representative of the circumboreal *P. maritima* L., with our typical seashore plants belonging to var. *decipiens* (Barneoud) Fern. Common around the whole coast; edges of salt marshes and dykelands, sea-cliffs and beaches. On headlands and in unfavorable locations the plants may be very small with reduced leaves and spikes. These may be called forma *pygmaea* (Lange) Rousseau (1943). Greenland and Hudson Bay south to Me. and Md.

Var. *laurentiana* Fern. has the leaves wider, lanceolate to oblanceolate, wide-spreading and often toothed. This is common around northern C.B. where all gradations in degree of leaf-width and type of spreading may be found. Coastal areas of the Gulf of St. Lawrence.

4. *P. oliganthos* R. & S. Fig. 123, g. Map 477. SEASHORE-PLANTAIN

Much less common than the preceding, scattered around the coast and largely restricted to salt marshes and tidal flats. The distinctness of this and the preceding species is again a matter of debate. The extremes appear quite different but this may be largely due to the differences in the habitats the two occupy. Gleason places this species also with *P. maritima* and states that careful studies have shown that these segregates merge completely. July-Sept.

Lab and Nfld. on the coast of the Gulf of St. Lawrence and south to N.J.; Man. and Alta.

5. *P. lanceolata* L. Fig. 123, c. RIB-GRASS, ENGLISH PLANTAIN

Common throughout, especially in hay-fields in late July and August and a common and troublesome weed in many locations. Fernald (1922) mentions a locally abundant variant with the spikes branching, sometimes with a few, often with many, short and densely crowded branches. This monstrosity is also found in the U.S. The plant is somewhat variable, especially in respect to the hairiness of the leaves.

Var. *sphaerostachya* Mert. & Koch has the spikes almost globose and rounded at the tip, instead of being elongated as in the typical variety. This is occasionally seen in the Annapolis Valley and in the southwestern counties on light soils. It is perhaps best regarded as only a form.

Naturalized from Eu.; throughout U.S. and Can.

6. *P. indica* L.

Halifax Co.; railway yard, Halifax, collected by M. S. Brown, 1950 (Erskine, D. S., 1951).

Native of Eurasia; and rapidly becoming established from N.S. to Minn. south to Va. along railroads, etc.

## 2. LITTORELLA Bergius

1. *L. americana* Fern. Map 479.

Some twenty stations are now known. The greatest concentration of the plant is in southern C.B. with scattered stations on the mainland. The general habitat is the gravelly or sandy bottoms of lakes in sheltered locations. Usually the plants are covered with from 3-18 inches of water, but occasionally extend deeper into the lakes. In only two locations were plants found above the water level at the time of collection. About half the collections are sterile. Flowering and fruiting specimens were found both exposed and immersed with flowering collections from July 19 to Sept 12. Often abundant locally (Smith, 1959). Formerly known only from the sandy shores of Shubenacadie Grand L, where it was first collected by Mrs. Britton in 1902. The American plants are slightly smaller than the European *L. uniflora* (L.) Asch.

Local from Nfld. to Ont. and Wisc. south to Me. and n. N.Y.

## 108. RUBIACEAE MADDER FAMILY

Our representatives of this large family are herbs and shrubs with simple, untoothed, opposite or apparently whorled leaves. The flowers are regular and perfect, with 3 or 4 lobes to the corolla, 4 stamens and an inferior 2-celled ovary.

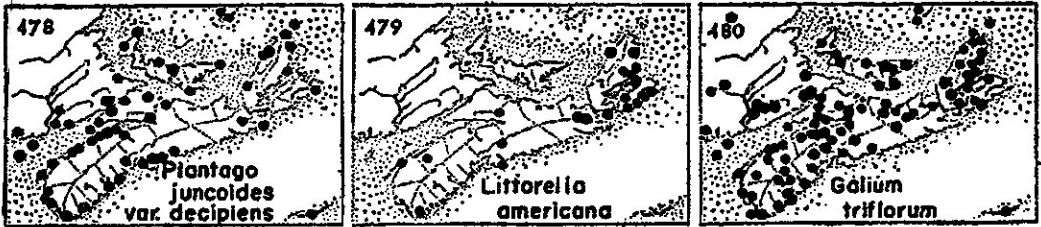
- a. Leaves in whorls; plants herbaceous; fruits of two nutlets joined side by side.
- b. Corolla long funnel-shaped; calyx-lobes lanceolate; flowers nearly sessile in leafy-bracted heads; fruits tipped by the persistent sepals. 1. *Sherardia*
- b. Corolla flat with wide-flaring lobes; calyx-lobes absent; flowers on slender pedicels (Fig. 124). 2. *Galium*
- a. Leaves opposite, or sometimes in 3's; fruit not as above.
- c. Tall shrubs; flowers in showy globular heads (Fig. 126, a). 4. *Cephalanthus*
- c. Low herbs; flowers few or in pairs.
- d. Plants trailing; leaves round-ovate; flowers pinkish-white, in pairs with one united ovary; fruit berry-like (Fig. 125, d). 3. *Mitchella*
- d. Plants erect; leaves lanceolate, small; flowers pale bluish, solitary; fruit a top-shaped capsule (Fig. 125, a). 5. *Houstonia*

## 1. SHERARDIA L.

1. *S. arvensis* L. BLUE FIELD-MADDER

Listed in Lindsay's Catalogue from Tatamagouche, Colchester Co. Nothing else is known of this plant in the Province and it is doubtful if it now occurs.

Introduced from Eu.; waste places and fields, N.S. and sw. Que. to N.C. and Mo.



## 2. GALIUM L. BEDSTRAW

Very common annual or perennial herbs with 4-angled stems and cymes of very small flowers; growing everywhere in damp ground and often in fields and woods. The fruit of two orbicular small nutlets, side by side, is distinctive; many of the species have sprawling, much-branched stems. About 300 widely-distributed species.

- a. Ovary and fruit covered with hooked bristles or hairs.
  - b. Leaves 1-nerved.
    - c. Stems weak and retrorsely hispid; plants annual; leaves mostly in whorls of 8.
      1. *G. Aparine*
    - c. Stems rather smooth, not clinging; plants perennial.
      - d. Plants usually prostrate; leaves lanceolate, in whorls of 6.
        2. *G. triflorum*
      - d. Plants short and erect; leaves in 2-4 whorls of 4, the upper whorl usually the largest, widely ovate; plant rare in northern C.B.
        3. *G. kamtschaticum*
    - b. Leaves prominently 3-nerved, firm, linear-lanceolate; stems smooth; leaves in whorls of 4.
      4. *G. boreale*
  - a. Ovary and fruit smooth or nearly so.
    - c. Flowers yellow; stem erect or nearly so, not retrorse-scabrous, pubescent with inturned hairs in the inflorescence; leaves often 6 in a whorl, linear.
      5. *G. verum*
    - c. Flowers white.
      - f. Stem smooth or nearly so; plants large, nearly erect, with large decompose inflorescences; leaves 6-10 in a whorl, narrowly lanceolate, upwardly scabrous on the margins, the tips sharp.
        - g. Branches of the inflorescence, and the pedicels, wide-spreading.
          6. *G. Mollugo*
        - g. Branches of the inflorescence, and the pedicels, ascending.
          7. *G. erectum*
      - f. Stems more or less prickly, or if smooth then with the plants very small and slender; plants matted, reclining or ascending, rather slender.

- h. Leaves rounded or acute at the tip but not with a sharp point; plants usually slender.
- i. Flowers numerous in a branched inflorescence, 2-3 mm wide, with 4 acute petals; leaves and stems barely retrorse-scabrous. 8. *G. palustre*
- i. Flowers solitary, or in 2's or 3's.
- j. Corolla commonly with 3 blunt lobes; flowers 1.5 mm wide; fruit 1.25-2.25 mm wide.
- k. Pedicels slender and arcuate, mostly 5-10 mm long; flowers mostly solitary.
  - l. Leaves, stems and pedicel with minute prickles; mature fruit 1.25-1.50 mm thick. 9. *G. trifidum*
  - l. Leaves, stems and pedicels smooth; mature fruit 1.5-1.75 mm thick. var. *halophilum*
- k. Pedicels straight and smooth, mostly 2-6 mm long; flowers mostly in 2's or 3's; leaves and young stems strongly retrorse-scabrous. 10. *G. tinctorium*
- j. Corolla commonly with 4 acute lobes; flowers 2-2.5 mm wide, the cymes once-branched with 2-4 flowers.
  - m. Leaves spreading or ascending, 1.5-2.5 cm long; inflorescence mostly terminal; fruit about 3 mm long, 2.5-3.5 mm thick. 11. *G. obtusum*
  - m. Leaves mostly reflexed, 0.5-1.5 cm long; inflorescence finally lateral; fruit about 1.5 mm long and 1-1.5 mm thick, on short pedicels. 12. *G. labradoricum*
- h. Leaves with a sharp pointed tip; plants very rough, often rather coarse. 13. *G. asprellum*

### 1. *G. Aparine* L. Fig. 124. CLEAVERS, GOOSE-GRASS

Sparingly introduced; Macoun lists it from ballast heaps and waste places at Pictou and North Sydney; and it is occasionally found elsewhere; Yarmouth Co. (Klawe).

Nfld. to Alaska south to Fla. and Tex.; Eurasia.

### 2. *G. triflorum* Michx. Fig. 124. Map 480. SWEET-SCENTED BEDSTRAW

Scattered throughout and common from Annapolis to northern C.B.; mixed or deciduous woods. July-Aug.

Nfld. to Alaska south to Va. and Calif.

### 3. *G. kamtschaticum* Steller Fig. 124. Map 481. NORTHERN BEDSTRAW

Scattered and local in rich hardwoods and ravines in northern C.B.; in the sugar-maple woods at Grand Anse but also in fir-birch associations on top of the plateau; often growing in colonies along cool ravines to the L. O'Law and Whyccomagh.

C.B., Nfld. and Que. south to northern New Eng. and N.Y.; the Aleutians and eastern Asia.

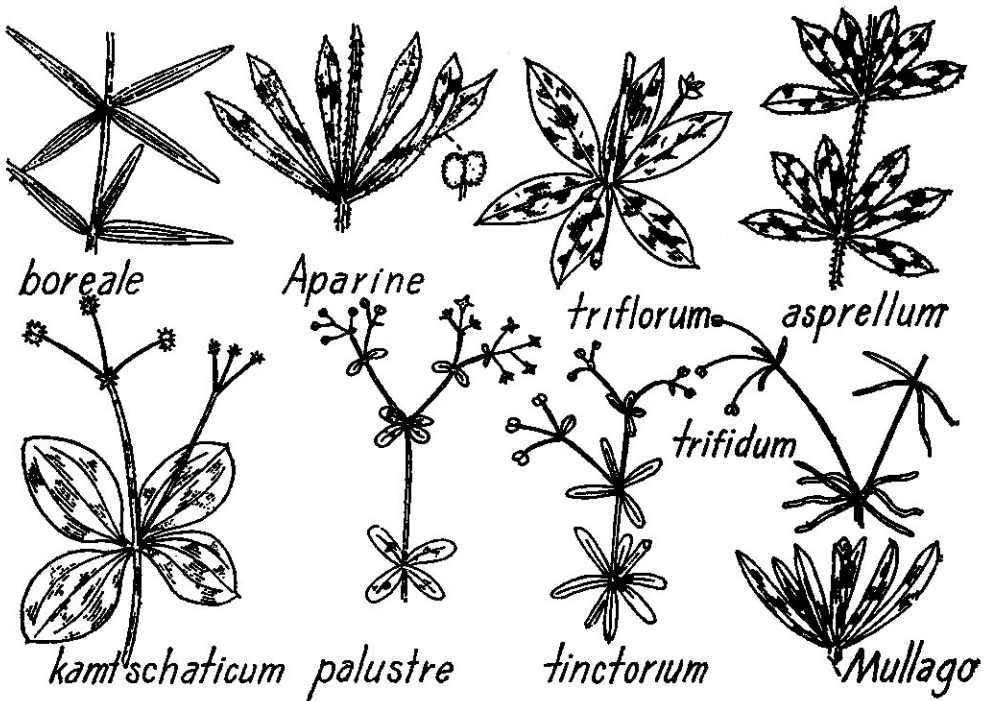
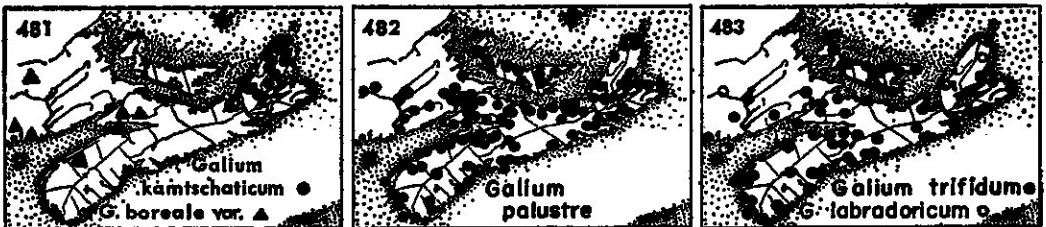


Fig. 124.—*Galium* spp.  $\times \frac{1}{2}$ .

4. *G. boreale* L., var. *intermedium* DC. Fig. 124. Map 481.

Top of Cape Blomidon, Kings Co., where it is local around the edges of woods and in grassy places; Cumberland Co.: a single colony on a hill-top pasture, New Prospect; dry field, Cross Roads (Schofield, 1955). Aug.

N.S. to Ont. westwards and south to Del. and Ind.



5. *G. verum* L. YELLOW BEDSTRAW

Rather rare; seen as an occasional escape along roadsides and near dwellings; on light soils near Kentville in Kings Co.

Recently introduced from Eu.; Nfld. to B.C. south to Va.

6. *G. Mollugo* L. CLEAVERS

This species was reported from Truemanville, Cumberland Co., by Macoun over 60 years ago. Since that time it has spread and become a

bad weed along roadsides and occasionally in fields in the northern and central part of the Province; local elsewhere but apparently spreading. Once established, it forms tall very dense clumps or colonies. July-Aug.

Naturalized from Eu.; Nfld. to Ont. south to Va. and Ind., B.C.

7. *G. erectum* Huds.

Similar to the previous species and probably best considered as a variety of it. This is scattered throughout the center of the Province and, like the last, seems to be becoming more common. It is sometimes weedy along roadsides and in some old fields. It is often considered a variety of the preceding species as var. *erectum* (Huds.) Domin. & Podp. July-Aug.

Introduced from Eu.; N.S. to New Eng. and N.Y.

8. *G. palustre* L. Fig. 124. Map 482. COMMON or MARSH-BEDSTRAW

Very common throughout; ditches, low ground, along streams and in alluvial soils. It is common on intervale meadows and along stream-banks where it grows among the grasses. July-Aug.

Nfld. to Wisc. south to Penn.

9. *G. trifidum* L. Fig. 124. Map 483.

Very wet and boggy places, local throughout except in northern C.B. and much less common than the preceding species, usually growing in rich alluvial soil along stream-bottoms and along swampy borders of freshwater ponds.

Var. *halophilum* Fern. and Wieg. is more fleshy and glabrous throughout. It is found on brackish shores and borders of salt marshes, probably around the whole coast. July 15-Aug.

The species is found from Lab. to Alaska south to N.Y. and Calif.; while the var. is known from Lab. to Mass.

10. *G. tinctorium* L. Fig. 124. SMALL BEDSTRAW

Low areas, along brooks, marshes and bogs; common throughout, flowering several weeks later than the preceding two species. Hara (1939) places this species and the preceding one into one circumboreal species connected by the following variety. (*G. Claytoni* Michx. of earlier records). Nfld. to Nebr. south to S.C. and Tex.

Var. *subbiflorum* (Weig.) Fern. is mostly a western variety intermediate between this and the last species. In the northeast it is more closely connected with, and grades into, *G. tinctorium*. It differs mainly in a tendency towards solitary flowers on longer, sometimes slightly prickly, pedicels. Pebbly lake shore, North Sydney, Howe and Lang. no. 752.

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

11. *G. obtusum* Bigel., see Fernald (1935).

Rare, with earlier records belonging to *G. palustre*. It is found in boggy swales and wet thickets in the Tusket Valley, Yarmouth Co.; and is to be expected elsewhere in southwestern N.S. Our variety is the typical one which is mainly on the coastal plain. (*G. tinctorium* in Gray, 7th ed.).

N.C. north to N.S. and occasionally inland to Ky., Mo. and Texas.

12. *G. labradoricum* Wieg. Map 483.

This neat and distinctive small *Galium* is scattered in Victoria Co. C.B.; abundant in wet meadow, Bay St. Lawrence (Smith and Erskine, 1954); Inverness Co.; common in an alkaline bog at Black River with other rare species. Erskine reports it from dune slacks and bogs on the north coast of P.E.I.

Nfld. to Man. south to n. New Eng., Penn. and Minn.

13. *G. asprellum* Michx. Fig. 124. ROUGH BEDSTRAW

Very common, the tangled rough masses are found clambering over low bushes and underbrush, roadside weeds and the sides of ditches; in low pastures, along brooksides, ditches, etc. throughout. July-Sept. Nfld. to Minn. and Nebr. south to N.C.

## 3. MITCHELLA L.

1. *M. repens* L. Fig. 125, d. Map 484. PARTRIDGE-BERRY

Common throughout; shady and mossy woods, moist banks and hummocky pastures; characteristic of deciduous climax forest in northern C.B.; local on turf-covered dunes on Sable I. It is mostly found in moist places or on hummocks where it does not meet the competition of more vigorous herbs or grasses. July.

Fla. to Texas north to Nfld., Ont. and Minn.

## 4. CEPHALANTHUS L.

1. *C. occidentalis* L. Fig. 126, a. Map 485. BUTTONBUSH

Local; rare in Shelburne Co.: rocky shore of Deception L., and among granite boulders at L. John (Fernald, 1921), at both stations rare and local; Queens Co.: collected by R. H. Wetmore at Cameron L. and later found to be common along the Medway R. and about the lakes near its head (Weatherby, 1942). This plant is distinctive in flower or fruit because of its globular heads of flowers or of densely packed nutlets. July 15-Aug. 15.

Fla. to Mex. north to N.S. and southern N.B., Que. and Ont.



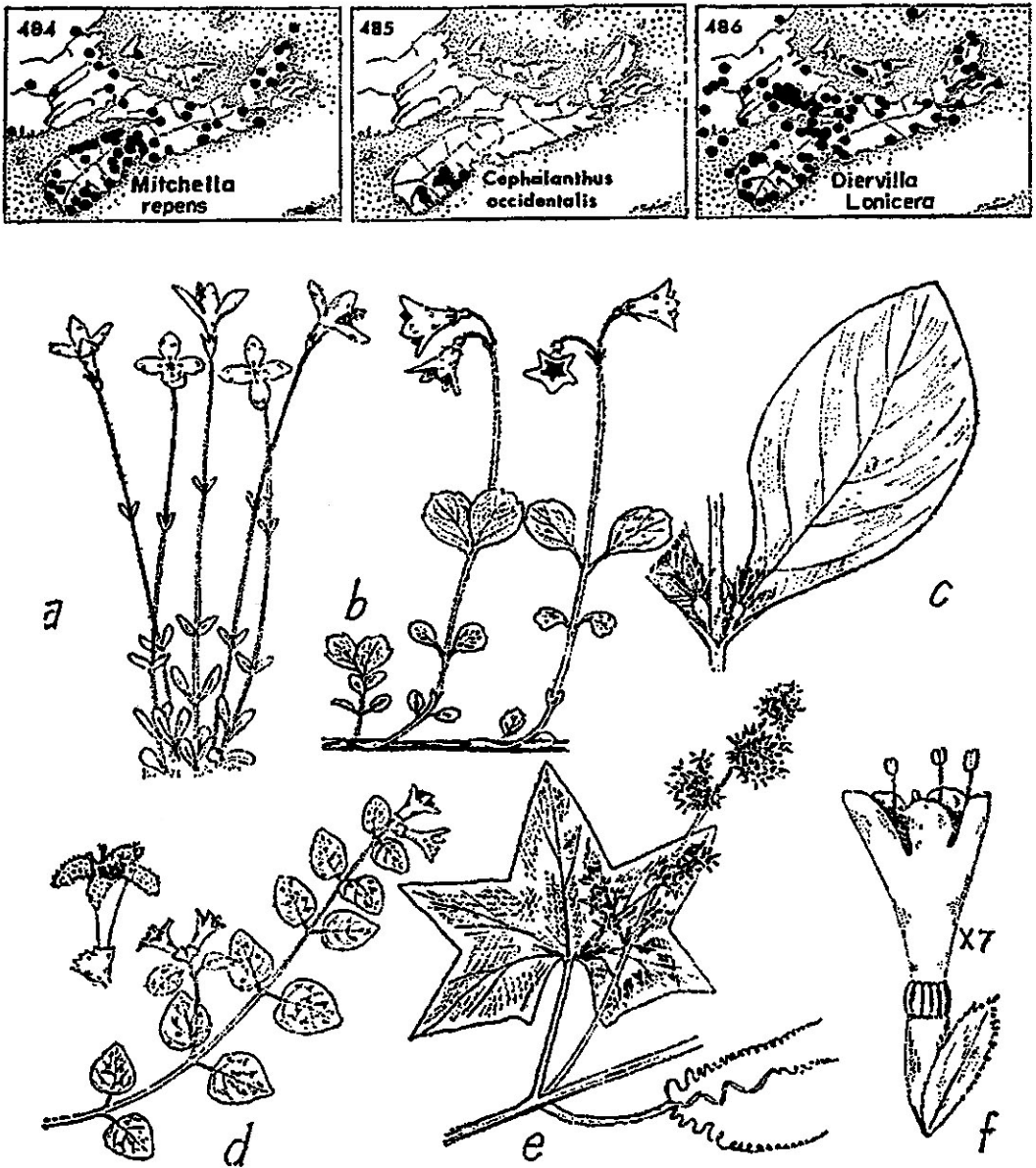


Fig. 125.—Houstonia: (a) *H. caerulea*  $\times \frac{1}{2}$ . — Linnaea: (b) *L. borealis*  $\times \frac{1}{2}$ . — Triosteum: (c) *T. aurantiacum*  $\times \frac{1}{2}$ . — Mitchellia: (d) *M. repens*  $\times \frac{1}{2}$ , flower  $\times 1$ . — Echinocystis: (e) *E. lobata*  $\times \frac{1}{2}$ . — Valeriana: (f) *V. officinalis*, flower much enlarged.

## 5. HOUSTONIA L.

### 1. *H. caerulea* L. Fig. 125, a. Map 491. BLUEETS

This small herb is around 7 cm high and tends to grow in tufts or large colonies. Occasionally it is so abundant that a moist hillside or a grassy pasture may be pale lavender when the plant is in flower. It is

scattered in the western counties, often abundant near Halifax and in the north-central area, and becomes rarer eastward. Mid-May to mid-June.

St. P. and Miq. I. to Ont. and Wisc. south to Ga. and Ark.

## 109. CAPRIFOLIACEAE HONEYSUCKLE FAMILY

Herbs, shrubs or vines with opposite leaves without stipules. The flowers are perfect, regular or irregular, with 5 corolla-lobes, 5 or 4 stamens, and an inferior ovary with 1-5 cells. Numerous species are grown as ornamental plants.

### a. Shrubs.

b. Leaves simple or merely palmately lobed.

c. Leaves finely and sharply toothed; fruit a capsule; flowers yellow; shrubs 3-6 dm high in spreading patches (Fig. 127, a). 1. *Diervilla*

c. Leaves entire, or obscurely and bluntly toothed; fruit a berry; flowers pinkish to cream-colored.

d. Flowers solitary or in axillary clusters; shrubs mostly less than 1.5 m high.

e. Corolla irregular, funnel-form; berry red or blue, 2-3-celled, several-seeded (Fig. 127, b,c). 2. *Lonicera*

e. Corolla regular and bell-shaped; berry white, waxy, 4-celled, 2-seeded (Fig. 127, d). 3. *Symphoricarpos*

d. Flowers small and numerous, in an erect compound inflorescence or cyme; shrubs mostly over 1.5 m high (Fig. 128). 6. *Viburnum*

b. Leaves pinnately compound, the leaflets toothed (Fig. 126, b, c). 7. *Sambucus*

### a. Herbs or trailing semi-woody plants.

f. Plant trailing, partly woody; flowers in pairs on upright branches, bell-like, pink; stamens 4 (Fig. 125, b). 4. *Linnaea*

f. Plant erect, herbaceous, around 1 m tall; flowers axillary, sessile, reddish; stamens 5 (Fig. 125, c). 5. *Triosteum*

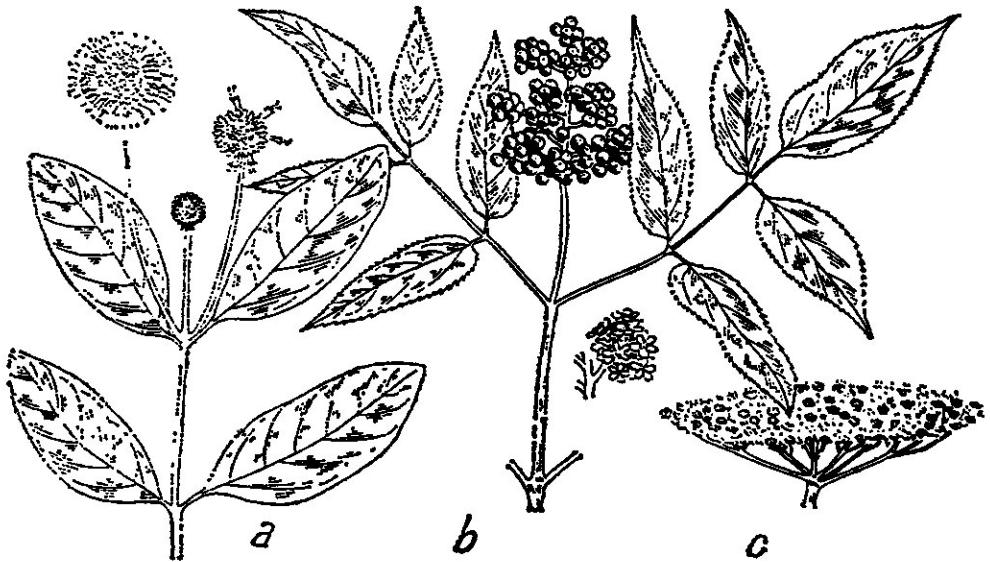


Fig. 126.—*Cephalanthus*: (a) *C. occidentalis*  $\times \frac{1}{2}$ . — *Sambucus*: (b) *S. pubens*, fruiting twig  $\times \frac{1}{2}$ , flower  $\times 1$ , (c) *S. canadensis*, inflorescence  $\times \frac{1}{4}$ .

## 1. DIERVILLA Mill.

1. *D. Lonicera* Mill. Fig. 127, a. Map 486. BUSH-HONEY-SUCKLE

Common throughout; sandy or stony ground, thickets, dry plains, roadsides and pastures; on very light soil it usually grows in the shade but otherwise it shows a wide range of habitats. June 20-July.

Nfld. to Sask. south to N.C. and Iowa.

## 2. LONICERA L. HONEYSUCKLE

Shrubs and vines with entire, opposite leaves. Each peduncle has a pair of sessile flowers, sometimes with their ovaries wholly united. The Tartarian Honeysuckle, *L. tatarica* L., is frequently cultivated as an ornamental shrub and may be found on dumps.

- a. Flowers in pairs or rarely solitary; plants bush-like, erect; native.
- b. Leaves elliptical, 2-4 cm long, thick and veiny; flowers cream-colored, on peduncles 3-7 mm long, crowded; fruit blue, the two ovaries united to form one berry; plants less than 1 m high. 1. *L. villosa*
- b. Leaves ovate, thin, smoothish and much larger; flowers greenish-yellow, on peduncles 14-30 mm long; fruit red, the two berries nearly separate; plants mostly over 1 m high. 2. *L. canadensis*
- a. Flowers in a dense head, purple tinged, turning yellowish; plant a twining vine; garden escape. 3. *L. Periclymenum*

1. *L. villosa* (Michx.) R. & S. Fig. 127, b. Map 487. MOUNTAIN FLY-HONEYSUCKLE

The typical variety is a northern depressed shrub which is densely hairy on the twigs and leaves. This has not been found in the Province. Several other varieties have been proposed but in N.S., and apparently elsewhere, these intergrade and appear more like forms. (*L. caerulea* L. var. *villosa* (Michx.) T. & G.).

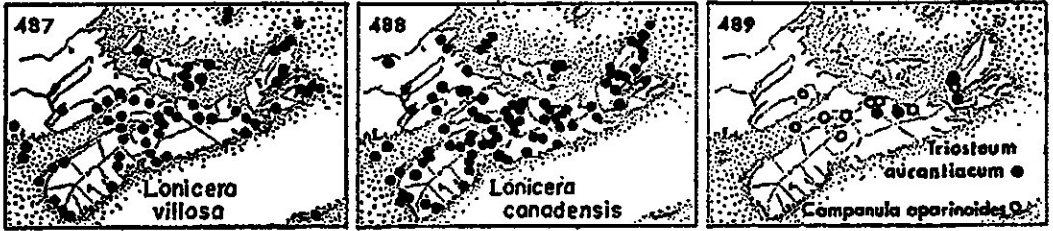
Var. *Solonis* (Eat.) Fern. has the young branches covered with fine short hairs mixed with longer ones and the leaves are pilose beneath. Var. *calvescens* (Fern. & Wieg.) Fern. has the young twigs with only fine short hairs or puberulence. Var. *tonsa* Fern. has the branches glabrous, and the leaves glabrous or nearly so. Most of the material found in bogs, wet pastures, heath-barrens and boggy thickets have the characteristics of the first two varieties; scattered in the cooler parts of the Province. Var. *tonsa* occurs in low pastures above Parrsboro and sometimes fruits abundantly. The berries are delicious in flavor and could be an article of diet where they are found in sufficient quantities. May.

Lab. to Alta. south to Mass., Mich. and Minn.

2. *L. canadensis* Bartr. Fig. 127, c. Map 488. AMERICAN FLY-HONEYSUCKLE

Common throughout, especially from Annapolis Co. to northern C.B.; light or rocky woods, ravine banks, and characteristic of hardwood forests. Early May.

N.S. to Ont. south to N.C. and Iowa.



3. *L. Periclymenum* L. WOODBINE

Noted by Fernald (1921) as becoming naturalized along roadside fence-rows about Yarmouth. The shrub is now becoming rather common there as an escape and is often seen along stone walls and rocky banks. July-Aug.

Native of Eurasia; widely cultivated and occasionally escaping.

3. SYMPHORICARPOS Duham.

1. *S. albus* (L.) Blake, var. *laevigatus* (Fern.) Blake. Fig. 127, d. SNOWBERRY, WAXBERRY

An old-fashioned shrub formerly widely planted around buildings and in gardens because of its large waxy berries; occasionally spreading and persisting; rarely found along roadsides. The variety is the more erect, western form with leaves glabrous beneath. This has been cultivated eastward; and it is difficult to separate it from the typical variety. (*S. rivularis* Suksdorf.). June.

Alaska to Calif. and Mont.; introduced eastwards.

4. LINNAEA Gronov.

1. *L. borealis* L., var. *americana* (Forbes) Rehd. Fig. 125, b. TWIN-FLOWER

Common throughout; characteristic of wooded swamps, spruce bogs and coniferous forests, often forming a carpet over the ground. It is especially common eastward in a variety of habitats, even in open sunlight; also on Sable I. Late June.

Lab. and Nfld. to Alaska south to Md., Ind. and Colo.

## 5. TRIOSTEUM L.

1. *T. aurantiacum* Bickn. Fig. 125, c. Map 489. FEVERWORT, HORSE-GENTIAN

Local; intervales or in rich soil along the rivers, in one place growing on limestone banks. It is rare and local above Truro and at Kempton in Colchester Co.; near New Glasgow in Pictou. Co.; and occasional on intervales in central and northern C.B. July. This plant is sometimes included as a variety of the wide-ranging *T. perfoliatum* L.

N.S. to western Ont. and Wisc. south to Md., Ga. and Iowa.

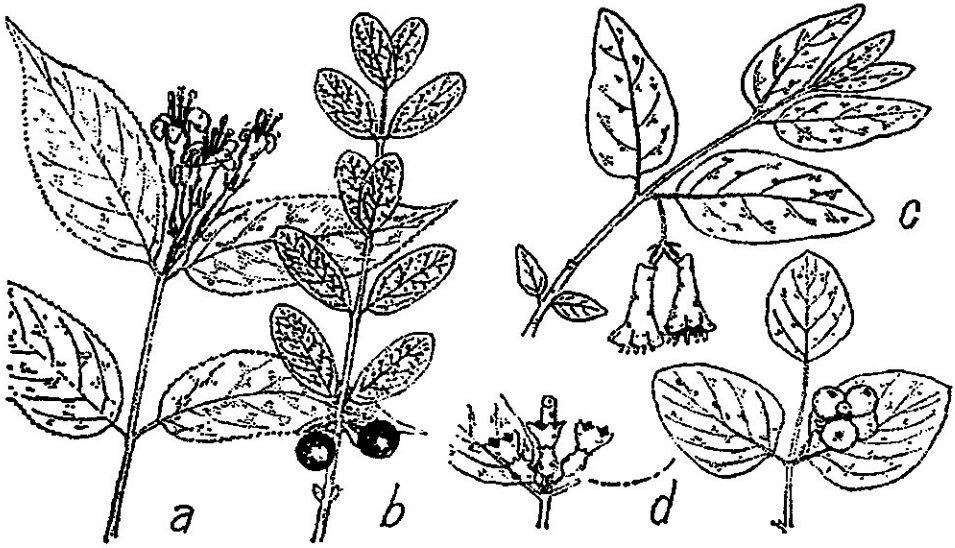


Fig. 127.—*Diervilla*: (a) *D. Lonicera* x  $\frac{1}{2}$ . — *Lonicera*: (b) *L. villosa* x  $\frac{1}{2}$ , (c) *L. canadensis* x  $\frac{1}{2}$ . — *Symphoricarpos*: (d) *S. albus*, fruiting twig x  $\frac{1}{2}$ , flower x 1.

## 6. VIBURNUM L.

Shrubs with simple or lobed opposite leaves and numerous small regular flowers in dense terminal cymes. In two of our species some of the outer flowers are enlarged and sterile to make a showy white inflorescence. A number of species are introduced and cultivated.

- a. Leaves not lobed, pinnately veined.
  - b. Cyme sessile, the marginal flowers large and showy; leaves large, heart-shaped; leaves, twigs and flower-stalks softly brown-scurfy. 1. *V. alnifolium*
  - b. Cyme stalked, the flowers all small; leaves not heart-shaped, usually widely lanceolate; leaves, twigs and flower-stalks only minutely brownish-dotted. 2. *V. cassinoides*
- a. Leaves palmately veined and 3-lobed.
  - c. Leaves without glands at the top of the petiole, slightly and shallowly lobed, glabrous beneath except for a conspicuous band of hairs along the main veins; cyme 1-4 cm wide, the flowers small and all alike. 3. *V. edule*

- c. Leaves with large conspicuous glands near the top of the petiole, deeply lobed; cyme 4-6 cm wide, the marginal flowers large and showy.
- d. Leaves smooth beneath except the veins; petioles with a wide and shallow groove above, and smaller club-shaped glands; stipules clavate, or with club-shaped tips.
4. *V. trilobum*
- d. Leaves downy beneath; petiole with a deep narrow groove along the top, and large disk-shaped glands; stipules near the base of the petiole mostly thread-like and tapering to the end.
5. *V. Opulus*

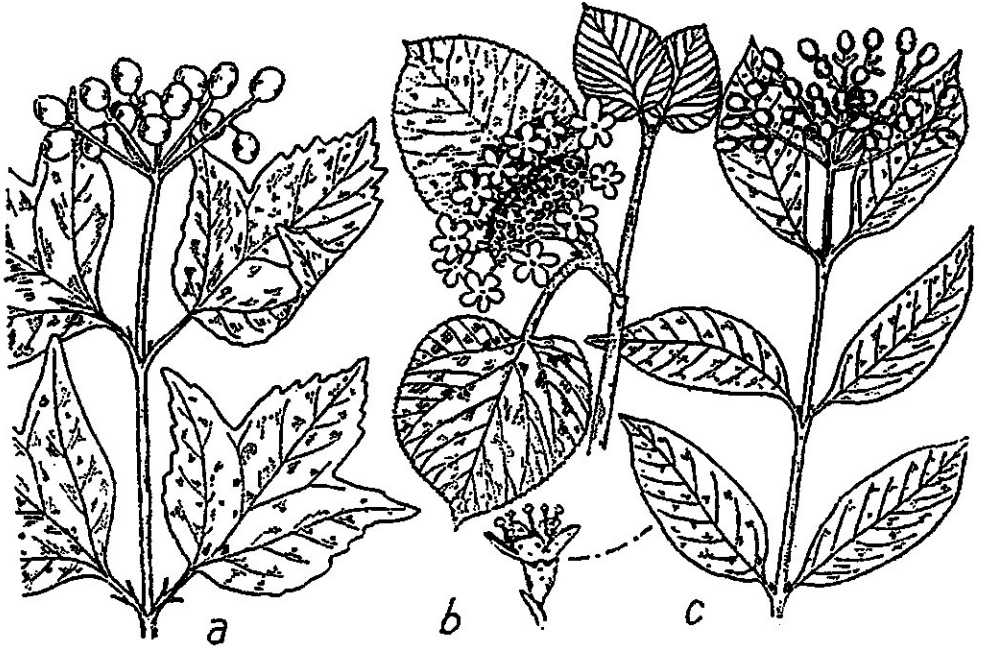


Fig. 128.—*Viburnum*: (a) *V. trilobum*  $\times \frac{1}{2}$ , (b) *V. alnifolium*  $\times \frac{1}{2}$ , (c) *V. cassinoides*  $\times \frac{1}{2}$ , flowers enlarged.

1. *V. alnifolium* Marsh. Fig. 128, b. Map 490. **HOBBLEBUSH**

Scattered in rich woods, shaded ravines and characteristic of rich hardwoods; rare in the southwestern counties, becoming frequent in Digby Co. and along the northern counties to northern C.B. (*V. lantanoides* Michx.). May 15-June 15.

N.S. to Mich. south to Ga. and Tenn. in the mts.

2. *V. cassinoides* L. Fig. 128, c. **WITHEROD, VIBURNUM**

Common throughout, often abundant in swamps, wet barrens, open low lands, and in all other types of locations from peaty barrens to dry open areas and pastures. The leaves show great variation in width. The abundant blue berries are insipid. June 20-July 15.

Nfld. to Ont. south to Md. and Wisc.

3. *V. edule* (Michx.) Raf. Map 491. CRANBERRYBUSH

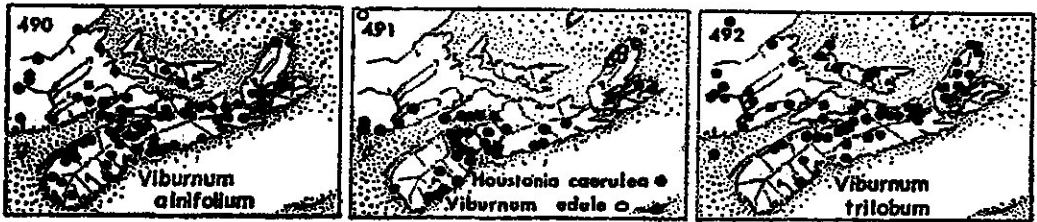
Cold woods and along streams; characteristic, according to Nichols, of the coniferous climax forest in northern C.B. This rather low bush, to 2 m high, is found in our area only in the coolest areas of C.B. and n. N.B. The red berries are very good for juice and jellies. (*V. pauciflorum* La Pylaie).

Nfld. and Lab. to Alaska south to Penn., Iowa and Wash.

4. *V. trilobum* Marsh. Fig. 128, a. Map 492. HIGHBUSH-CRANBERRY

This American variant of *V. Opulus* is found from Annapolis and Cumberland Co. to northern C.B.; occasional in the Annapolis Valley in swamps and along streams, it becomes more common eastward along the intervalles of central N.S. Berries are bright red, of an aromatic flavor and excellent for cooking. (*V. Opulus* var. *americanum* Ait.). June-early July.

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

5. *V. Opulus* L. EUROPEAN CRANBERRYBUSH

Frequently planted and occasionally escaping along roadsides, stream banks or intervalles, especially in the northcentral counties. The fruits of this species are bitter, June 15-July 15.

Widely introduced from Eu.

## 7. SAMBUCUS L. ELDER

These are our only shrubs with opposite, pinnately-compound leaves; the small, numerous white flowers are in large terminal cymes.

a. Flowering July 15-Aug.; inflorescence almost flat; corolla-lobes spreading when dried; fruit dark-purple; pith of the young twigs whitish. 1. *S. canadensis*

a. Flowering June 1-June 20; inflorescence pyramidal-shaped; corolla lobes reflexed in drying; fruit red; young pith reddish-brown. 2. *S. pubens*

1. *S. canadensis* L. Fig. 126, c. Map 493. COMMON ELDER

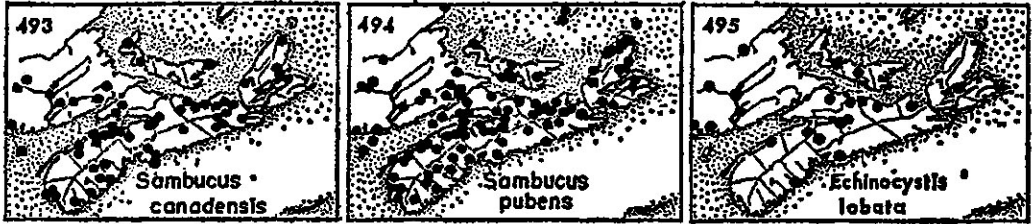
Common in rich soil, open woods, around old fields and along brooks, usually where the ground is damp or there is water, especially in the center of the Province; in wet flood-plains and meadows in northern C.B. Fruit edible. July 15-Aug.

N.S. to Ont. south to Ga., La. and Okla.

## 2. *S. pubens* Michx. Fig. 126, b. Map 494. RED-BERRIED ELDER

Common in wet places, rocky hillsides or along streams throughout, occurring as scattered plants in the climax forest in northern C.B.; sometimes almost weedy in central N.S. where it may grow along the edges of meadows or even near open fields in rich ground. Berries rather poisonous. June 1-June 20. (*S. racemosa* L., var. *pubens* (Michx.) Wats.).

Nfld. to Sask. south to Penn., Ga. and Colo.



## 110. VALERIANACEAE VALERIAN FAMILY

Tall herb with pinnately-lobed opposite leaves; with small pinkish to white flowers in a crowded terminal inflorescence; corolla tubular with 5 lobes; stamens 3, exserted.

### 1. VALERIANA L.

#### 1. *V. officinalis* L. Fig. 125, f. GARDEN-HELIOTROPE

This old-fashioned garden plant is found occasionally as an escape or persisting for a time in old gardens, about dwellings or on roadsides, not spreading. July 15-Aug.

Introduced from Eurasia and widely distributed from N.S. to Ont. and Minn. south to Penn.; B.C.

## 111. DIPSACACEAE TEASEL FAMILY

### 1. SUCCISA Neck.

#### 1. *S. pratensis* Moench Fig. 129, e. DEVIL'S-BIT

Common about Louisburg where it grows about dwellings, along roadsides, in fields and waste places; known elsewhere in Can. only in Ont. The leaves are chiefly basal and the flowers are a bright blue. Aug.-Sept. (*Scabiosa Succisa* L.). A rather similar plant from Nfld., and N.B. to B.C. is *Knautia arvensis* (L.) Duby. This has the lower leaves deeply lobed and the receptacle of the flowers with dense hairs instead of bracts; apparently not yet established in N.S.

Eurasia; introduced into N.S., Ont. and Mass.



## 112. CUCURBITACEAE GOURD FAMILY

This family is represented by the squash (*Cucurbita maxima* Duchesne), the pumpkin (*C. Pepo* L.), and the cucumber (*C. sativus* L.). The following is our only member growing without cultivation.

## 1. ECHINO CYSTIS T. &amp; G.

1. *E. lobata* (Michx.) T. & G. Fig. 125, e. Map 495. WILD CUCUMBER

This climbing plant, cultivated as a cover for fences and walls, often escapes to waste places near towns and grows luxuriantly on dumps and persists in rich river-bottoms in the central and southern parts of the Province; doubtfully native to N.S. July-Sept.

N.S. to B.C. south to Fla. and Tex.

## 113. CAMPANULACEAE BLUEBELL FAMILY

Herbs with simple alternate leaves; flowers blue to whitish, either regular or irregular; petals 5, united at the base; stamens 5; ovary inferior, with many ovules. The 2 genera treated here are usually placed in 2 separate families, each family with over 600 species.

- a. Corolla regular, bell-shaped; anthers separate; capsule opening by lateral pores.
  - 1. *Campanula*
- a. Corolla very irregular; anthers united into a tube about the style; capsule opening at the top.
  - 2. *Lobelia*

## 1. CAMPANULA L. BLUEBELL

- a. Plants 6-10 dm high; flowers blue, 2-3 cm long, in an erect terminal spike; stem-leaves wide and toothed.
  - 1. *C. rapunculoides*
- a. Plants 1-6 dm high, weak; flowers few; stem-leaves linear and mostly not toothed.
  - b. Stem erect, smooth above; corolla blue, 15-25 mm long.
    - 2. *C. rotundifolia*
  - b. Stem weak and filiform, very rough and clambering; corolla white, 6-10 mm long.
    - 3. *C. aparinoides*

1. *C. rapunculoides* L. Fig. 129, a. BELL-FLOWER, BLUEBELLS

Formerly planted as an ornamental and very persistent, escaping to fields and roadsides. This perennial plant spreads by long underground rootstocks and is often weedy and difficult to eradicate in small gardens or lawns. July 15-Aug.

Introduced from Eurasia; Nfld. to Alta. south to Md. and Ohio.

2. *C. rotundifolia* L. Fig. 129, b. Map 496. HAREBELL

Common around the coast and in cooler parts of the Province; it is often abundant near the sea in meadows, on damp cliffs, and occasionally on cliffs along streams inland. It is extremely variable in size,



Fig. 129.—*Campanula*: (a) *C. rapunculoides*, top of plant  $\times \frac{1}{2}$ , (b) *C. rotundifolia*  $\times \frac{1}{2}$ , basal leaves  $\times \frac{1}{2}$ , (c) *C. aparinoides*  $\times \frac{1}{2}$ . — *Lobelia*: (d) *L. inflata*, top of plant  $\times \frac{1}{2}$ , (f) *L. Dortmanna*  $\times \frac{1}{2}$ . — *Succisa*: (e) *S. pratensis*, inflorescence and leaf  $\times \frac{1}{2}$ .

branching, size and number of flowers, width of leaves and degree of pubescence. The American plants are smooth instead of being pubescent at the base and have been segregated as var. *intercedans* (Witasek) Farw. All the characteristics intergrade and variations are best regarded as being due to the influence of the environment. Forma *albiflora* Rand & Redf. is a rare white-flowered form with each of the following collections consisting of a single plant: among typical plants on cliff face, Rigwash Valley, Inverness Co.; and growing with the typical form on an exposed headland, White Point, Victoria Co. (Schofield and Smith, 1953). June 15-Sept.

Boreal America and Eurasia south to Penn., Ind. and Tex.

3. *C. aparinoides* Pursh Fig. 129, c. Map 489. MARSH-HARE-BELL

Collected along ditches in a meadow north of Auburn, Kings Co.; Ganong reports it as a minor form in the wet marsh about the head of the

Bay of Fundy; near the mouth of the Economy R., Colchester Co. (J. S. Erskine, 1953); abundant along river beaches and in meadows, Kennetcook R. near Mosherville in Hants Co.; abundant in meadow, Marshy Hope, Pictou Co. (Smith and Erskine, 1954); abundant on banks of the Parrsboro R. and common in moist area near Frog Pond, Isle Haute, Cumberland Co. (Schofield, 1955). Aug.

N.S. to Minn. and Sask. south to Ga. and Colo.

## 2. LOBELIA L.

Consult Bowden (1960).

- a. Stem leafy; leaves linear or flat; plants of dry to moist habitats.
- b. Stem slender, rarely branched; stem-leaves narrow; fruit not greatly enlarged or inflated; plants smooth or nearly so.
  - c. Pedicels of the flowers 2-4 mm long, with tiny bracteoles only at the base; leaves oblanceolate. 1. *L. spicata*
  - c. Pedicels of the flowers about 1 cm long, with tiny bracteoles to above the middle; leaves linear. 3. *L. Kalmii*
- b. Stem stouter, the inflorescence often branched; stem-leaves oblong and toothed; fruit oval, soon much swollen; plants often rough-hairy. 2. *L. inflata*
- a. Stem naked, hollow; leaves in a basal rosette, the blades oval in cross-section, rolled to resemble two united cylinders; growing in shallow water or on wet mud. 4. *L. Dortmanna*

### 1. *L. spicata* Lam. BLUE LOBELIA

Rare in the Maritimes; local and weedy on the top of Cape Blomidon, Kings Co.; Yarmouth Co. (Klawe 1955); locally abundant in a dry field near the shore, Linden, Cumberland Co. (Schofield, 1955).

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

### 2. *L. inflata* L. Fig. 129, d. Map 497. INDIAN-TOBACCO

Common throughout except in northern C.B.; dry pastures, run-out fields, roadsides, barrens, etc., usually scattered. July-Aug.

N.S. to Ont. south to Ga., and Ark.; s. B.C.

### 3. *L. Kalmii* L. Map 499.

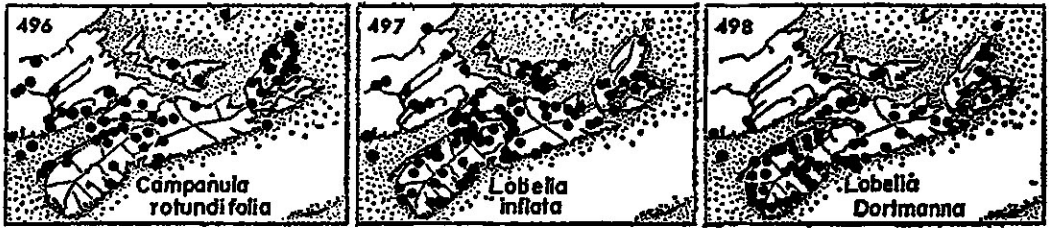
Rare; known only from dripping cliffs, meadows, or bogs in northern C.B., usually in calcareous or marly locations; abundant in an alkaline bog at Black River, Inverness Co.; and occasional in a wet quaking mat near McAdam Lake in C.B. Co. At Black R. some of the plants had white flowers. This is forma *leucantha* Rouleau.

Nfld. to B.C. south to C.B., Penn., Ind. and Colo.

### 4. *L. Dortmanna* L. Fig. 129, f. Map 498. WATER LOBELIA

Common at margins of lakes and ponds in the southern or acid regions of the Province, rarer northward and in sandy areas. It grows

at the edge of the water with the rosette of leaves submersed and the height of the stem varying with the depth of the water. Aug. Nfld. to Minn. south to Penn.; B.C. to Oreg.



#### 114. COMPOSITAE COMPOSITE FAMILY

Flower-heads composed of many florets grouped on a common *receptacle*, surrounded by one to several rows of bracts making up the *involucre*. Scales growing on the receptacle among the florets are called *chaff*. If chaff is absent, the receptacle is said to be naked. The flower-heads may have two kinds of florets: tubular or *disk florets* and those with the corolla drawn out into a ray or ligule which are called *ray florets*. The flower-heads are said to be *discoid* if the florets are all disk florets. The flower-heads are called *ligulate* when all the florets are ray florets, as in the dandelion. Each floret is an individual flower with an inferior ovary. The calyx, however, is reduced to scales, teeth, bristles, or may be absent. This reduced calyx is called the *pappus*; and it is most conspicuous after the fruit is formed. The fruit is a one-seeded, dry fruit called an *achene* and resembles, and is often wrongly called, a seed.

The Composite Family is a very large family, consisting of more than 15,000 species. Our representatives are mostly herbs, with only a few being woody at the base. The family is represented here by 10 tribes but the differences between them are rather technical and the following key is entirely artificial.

- a. Flower-heads either radiate or discoid.
  - b. Flower-heads radiate, with both disk and ray florets.
    - c. Pappus of capillary bristles; receptacle not chaffy.
      - d. Flowers on bracted stems, appearing before the typical green leaves in early spring.
        - Heads solitary, like a tiny dandelion; flowers yellow; summer-leaves heart-shaped and angled, large (Fig. 138, b). 26. *Tussilago*
        - Heads numerous, whitish; later leaves reniform, deeply lobed (Fig. 138, c). 27. *Petasites*
      - d. Flowers on leafy branches or main stems.
        - c. Flowers yellow or orange (cream-colored in one species of goldenrod-*Solidago*).
          - Involucral bracts in one series, often with minute bractlets at the base.
            - Leaves opposite; entire to shallowly toothed. 28. *Arnica*

Leaves alternate, the upper usually lobed or fringed on the edge.

30. *Senecio*

Involucral bracts in 3 to many series.

Flower-heads large, 2.5-10 cm wide (Fig. 135,f); plants tall and coarse; leaves densely woolly beneath.

9. *Inula*

Flower-heads only 5-15 mm wide; florets and rays few; goldenrods (Fig. 130, 131).

3. *Solidago*

c. Flowers blue, violet or white; receptacle flattish, many disk florets and usually many rays.

Involucral bracts in 3 to 5 series, often very unequal, sometimes leafy or with chartaceous base and a green tip; rays flat, and not crowded.

4. *Aster*

Involucral bracts often subequal, often green in part but not leafy nor with chartaceous base and green tips; peduncles usually not leafy; rays narrow and often very numerous (Fig. 134).

5. *Erigeron*

c. Pappus of scales, awns, a mere crown or absent, not of capillary bristles.

f. Stem leafless, leaves all basal; flowers solitary, white to purplish; garden escape.

2. *Bellis*

f. Stem more or less leafy.

g. Leaves finely and several times divided.

Plants aquatic; leaves of two kinds, the submersed ones finely divided and the exposed ones merely lobed; pappus of awns (Fig. 137, a).

17. *Megalodonta*

Plants terrestrial; leaves all similar; pappus absent or a mere crown.

Flower-heads 3-5 cm wide, daisy-like with conspicuous rays (Fig. 137,c); achenes terete.

Receptacle chaffy (Fig. 137,c).

20. *Anthemis*

Receptacle not chaffy.

21. *Matricaria*

Flower-heads 3-10 mm wide; rays small (Fig. 137, b); receptacle chaffy; achenes much flattened.

19. *Achillea*

g. Leaves widely lobed, or toothed, or entire.

Leaves linear; flowers pink; low slender herb with opposite leaves; Yarmouth Co.

15. *Coreopsis*

Leaves wider, toothed or lobed.

Flower-heads very small with 4-5 grayish rays; plants low and weak with ovate, hairy leaves; plants introduced and weedy.

18. *Galinsoga*

Flower-heads more than 1 cm wide; rays white to yellow.

Receptacle chaffy; rays yellow.

Pappus of awns which are persistent on the top of the flattened achene, often retrorsely barbed (Fig. 136, d, e).

16. *Bidens*

Pappus absent, or a mere crown, or of scales which usually disappear.

Receptacle strongly conic or columnar; plant 3-6 dm high with narrow lanceolate leaves, or tall and slender with leaves 3-5-parted (Fig. 136, b, c).

13. *Rudbeckia*

Receptacle merely concave or nearly flat; plants 1-2 m high; leaves entire, widely lanceolate or ovate.

14. *Hellanthus*

Receptacle not chaffy; rays white or rarely yellow.

22. *Chrysanthemum*

b. Flower-heads discoid, without rays.

h. Staminate and pistillate flowers separated in very different-appearing heads on the same plant; heads discoid; involucre of the pistillate flowers closed and indurated, with 1-2 florets; staminate heads numerous in terminal or axillary racemes.

Pistillate heads small in the axils of leaves at the base of the staminate racemes, with a few acute tubercles at the apex; leaves opposite, or alternate and pinnately divided (Fig. 136, a).

11. *Ambrosia*

Pistillate heads forming conspicuous oblong to oval burs covered with hooked spines; leaves rough, alternate and cordate (Fig. 135, c).

12. *Xanthium*

- h. Staminate and pistillate florets not in very different-appearing heads; involucre of the fertile flowers not indurated, with the bracts more or less separate.

- i. Pappus composed of capillary bristles.

- j. Involucral bracts papery throughout; plants more or less whitish-woolly; stem-leaves scale-like to linear.

Basal leaves larger than the stem-leaves, forming a rosette; stem-leaves much reduced (Fig. 134, c, f).

6. *Antennaria*

Basal leaves similar to the stem-leaves or absent; stem-leaves long and linear.

Involucre papery white, the bracts finely striate, spreading; plants forming colonies by underground rootstocks (Fig. 135, a).

7. *Anaphalis*

Involucre yellowish-white or brownish, the bracts not striate, rather appressed; plants solitary, not forming colonies (Fig. 135, b, c).

8. *Gnaphalium*

- j. Involucra! bracts not wholly thin and colorless, if partly so then the plants not whitish-woolly or the stem-leaves linear.

- k. Involucral bracts in one row, often with minute bractlets at the base.

Flowers in early spring, on bracted stems; green leaves in summer basal, reniform, deeply and palmately 5-7-lobed (Fig. 138, c).

27. *Petasites*

Flowers on green leafy stems, appearing in summer and autumn.

Leaves simple and merely toothed; flower-heads 15-20 mm long, the marginal florets all pistillate, whitish (Fig. 139, a).

29. *Erechtites*

Leaves, at least the stem-leaves, deeply lobed; flower-heads 7-10 mm long, the flowers all perfect, yellowish (Fig. 139, b)

30. *Senecio*

- k. Involucral bracts in 2 to many rows.

- l. Leaves and stems neither bristly nor spiny.

Corolla deeply lobed; involucral bracts deeply toothed or lobed along the sides; receptacle bristly; leaves alternate; plants low and usually much branched (Fig. 140, a).

36. *Centaurea*

Corolla merely toothed; involucral bracts not lobed; receptacle without chaff; leaves opposite or whorled on tall, unbranched stems (Fig. 130, a, b).

1. *Eupatorium*

- l. Leaves and stem bristly or spiny; thistles.

- m. Flowers white to purple; pappus of a single row of similar hairs or bristles.

- n. Pappus with the capillary hairs plumose (with very fine branches).

33. *Cirsium*

- n. Pappus of unbranched or merely barbellate capillary hairs.

- o. Receptacle densely bristly, the bristles scattered among the florets.

Involucral bracts linear to lanceolate; stamen filaments hairy, separate.

32. *Carduus*

Involucral bracts large and ovate; flower-heads solitary; filaments smooth, united into a tube.

35. *Silybum*

- o. Receptacle conspicuously honey-combed, not bristly; leaves cottony-woolly; stem strongly winged.

34. *Onopordum*

m. Flowers yellow; pappus of 10 short teeth, 10 long bristles, and 10 shorter ones in an inner row; whorl of reduced prickly leaves just below the flower-head; leaves scarcely or not running down the stem. 37. *Cnicus*

i. Pappus a mere crown of short bristles, scales or awns, or none.

p. Flowers rose to purplish; flower-heads globular; the corollas deeply lobed; receptacle bristly or chaffy.

Involucral bract stiff and narrow with inwardly-turned hooks, forming a bur; pappus of scales; burdocks. 31. *Arctium*

Involucral bracts not hooked, deeply cut or more often deeply lobed along the sides; fruiting head not a bur; pappus absent or very short hairs. 36. *Centaurea*

p. Flowers yellow to yellowish-white; corollas very small, slightly toothed.

q. Leaves ovate to widely lanceolate, merely toothed, rough; the lower ones opposite; receptacle small, chaffy. 10. *Iva*

q. Leaves finely divided; receptacle not chaffy.

r. Plants 1-3 dm high, annual or occasionally biennial; receptacle strongly conical; flowers dull green to yellowish (Fig. 137, d).

Leaves finely divided, their bases not sheathing the stem; common weeds. 21. *Matricaria*

Leaves toothed or coarsely lobed with sheathing bases; rare on salt flats. 24. *Cotula*

r. Plants over 3 dm high; receptacle flat or slightly convex.

Flower-heads in a flat-topped inflorescence, bright yellow and button-like, erect; tansy. (Fig. 137, c).

23. *Tanacetum*

Flower-heads paniculate, racemose, or spicate, dingy yellow to straw-colored; flowers small (Fig. 138, a).

25. *Artemisia*

a. Flower-heads with the florets all ligulate; juice of the plant usually milky.

s. Leaves chiefly in a basal rosette or near the base.

t. Flowers small, less than 10 mm wide; pappus absent; plants wiry, 1-3 dm high; rare. 39. *Arnoseris*

t. Flowers 1.5-4 cm wide; pappus of capillary bristles; plants larger and stouter.

u. Leaves lanceolate, not toothed; stolons often present (Fig. 142). 49. *Hieracium*

u. Leaves toothed to more or less deeply lobed.

v. Flower-heads solitary; bristles of the pappus simple; achenes spiny near the summit; dandelions (Fig. 141, b).

44. *Taraxacum*

v. Flower-heads several to numerous; achenes not spiny.

w. Pappus bristles plumose (branched); plants low, mostly less than 5 dm high; leaves all basal, lanceolate.

Receptacle chaffy; inner achenes long-beaked; leaves coarse and stiffly hirsute or hairy (Fig. 140, d).

41. *Hypochoeris*

Receptacle not chaffy; inner achenes not long-beaked; leaves smoothish to finely pubescent (Fig. 140, c).

42. *Leontodon*

w. Pappus bristles simple.

Plants slender, annual or occasionally biennial, without a stout rootstock; bracts of the involucre in one row with smaller ones at the base. 47. *Crepis*

Plants coarse and stout, perennial with a stout short rootstock; bracts of the involucre in several series.

49. *Hieracium*

s. Leaves mainly scattered along the stem.

x. Pappus of small scales, or else absent.

Flowers small, to 10 mm wide, yellow; pappus absent; plants slender, little branched (Fig. 140, f).

38. *Lapsana*

Flowers large, more than 4 cm wide, blue; pappus of scales; plants coarse, woody, much branched (Fig. 140, e).

40. *Cichorium*

x. Pappus of capillary bristles.

y. Pappus bristles plumose; leaves long and linear, grass-like; plants usually not branched; achenes long-beaked, 10-15 mm long (Fig. 140, b).

43. *Tragopogon*

y. Pappus bristles simple and capillary.

z. Flowers yellow; achenes not beaked.

Achenes flattened; pappus bristles shining white; leaves smooth and glaucous; plants succulent (Fig. 141 a).

45. *Sonchus*

Achenes not flattened; pappus bristles tawny; leaves firm, rarely glaucous; plants stiff (Fig. 142).

49. *Hieracium*

z. Flowers bluish, cream-colored, or purplish white to brownish.

Flower-heads erect; achenes more or less strongly flattened, beaked or at least expanded at the summit where the pappus is attached; bluish or cream-colored.

46. *Lactuca*

Flower-heads usually bell-like, hanging, with a few florets, pale purplish-white, brownish or cream-colored (Fig. 141, d); achenes cylindrical, not long-beaked.

48. *Prenanthes*

## 1. EUPATORIUM L.

Tall perennial plants, unbranched up to the large flat-topped inflorescence; leaves opposite or whorled; flower elongated, numerous and discoid with a pappus of capillary bristles. This is a large genus of some 500 species.

a. Leaves in whorls of 3-6, or the upper opposite, their bases not united; flowers purplish.

b. Leaves abruptly contracted to the petiole, more or less 3-nerved; plants somewhat viscid; florets mostly 6-10. 1. *E. dubium*

b. Leaves tapering to the petiole, mostly pinnately-veined; plant not viscid; florets mostly 9-20 in each head.

c. Leaves smaller above, not overtopping the inflorescence. 2. *E. maculatum*

c. Leaves large on the upper part of the stem, the upper much overtopping the inflorescence. *E. maculatum* var. *foliosum*

a. Leaves opposite; flowers white or a dingy pinkish-white.

d. Leaves lanceolate, sessile and the bases of the two opposite leaves united; flowers mostly 5 in each head. 3. *E. perfoliatum*

d. Leaves broadly ovate, with definite petioles; flowers 12-24 in each head.

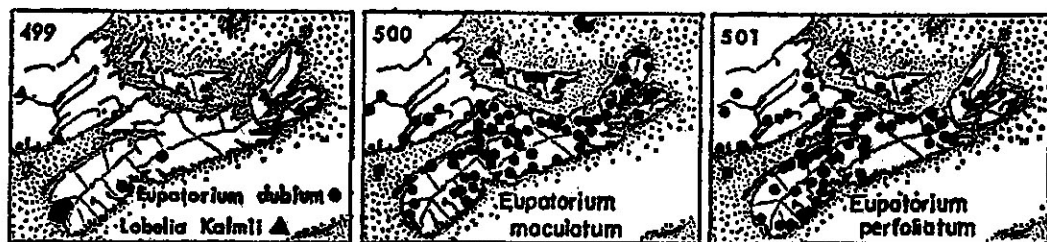
4. *E. rugosum*



1. *E. dubium* Willd. Map 499.

Local to rare; isolated clumps about the rocky shores of some of the lakes in the Tusket Valley, Yarmouth Co.; scattered east to Halifax and Lunenburg Co. and near Guysborough. Aug-Sept.

N.S. and southwestern Me. south to S.C.

2. *E. maculatum* L. Fig. 130, a. Map 500. JOE-PYE-WEED

Common and conspicuous in clumps along brooks, edges of meadows and swamps throughout the northern region from Digby Neck to northern C.B.; rare southward. Forma *Faxoni* Fern. has white flowers. Two plants in a marsh at Whycocomagh (Erskine, J.S., 1953). Late July-Sept. Nfld. to B.C. south to Penn., in the mts. to N.C., and Mich.

Var. *foliosum* (Fern.) Wieg. is found throughout the eastern range of the species and is not uncommon in northern N.S. and P.E.I. This may grade into the species but the extremes are very conspicuous. Nfld. to n. Ont. south to N.S. and New Eng.

3. *E. perfoliatum* L. Fig. 130, b. Map 501. BONESET

Scattered throughout, except for northern C.B.; wet shores, meadows, edges of swamps and bogs, along ditches, streams and meadows. The plants are usually scattered and it does not become a weedy species. Forma *purpureum* Britt. has the heads of varying shades of pink or red; abundant along the river at Ste. Croix, Hants Co. Forma *trifolium* Fassett has 3 leaves at a node instead of two. Late summer and autumn.

N.S. to s.Man. south to Fla., Ala. and Texas.

4. *E. rugosum* Houtt. WHITE SNAKEROOT

Cumberland Co.; frequent along brook near outlet to the sea, Mill Brook west of Advocate, collected by J.S. Erskine. This is the only location known for N.S.; and is an extension from western N.B. (Smith and Erskine, 1954).

N.S. and Gaspé to Ont. south to the uplands of Ga. and Ala.



Fig. 130.—Eupatorium: (a) *E. maculatum*, top of plant  $\times \frac{1}{2}$ , (b) *E. perfoliatum*, opposite leaves  $\times \frac{1}{2}$ . — Solidago: (c) *S. bicolor*, top of plant  $\times \frac{1}{2}$ , (f) stem pubescence, (i) flower  $\times 3$ , (d) *S. puberula*, flower  $\times 3$ , (e) stem pubescence, (g) *S. nemoralis*, stem pubescence, (h) *S. uliginosa*, inflorescence  $\times \frac{1}{2}$ , (j) *S. flexicaulis*, leaf and flowers  $\times \frac{1}{2}$ .

## 2. BELLIS L.

### 1. *B. perennis* L. ENGLISH DAISY

Macoun reported this plant from meadows and pastures, North Sydney, where it has escaped from ballast. English daisies are often cultivated in gardens and show some tendency to persist and spread locally. However, they are rarely persistent and the recent, double forms are not too hardy.

Introduced from Eu. and widely distributed.

### 3. SOLIDAGO L. GOLDENROD

The goldenrods, with one exception, have numerous yellow flower-heads with a few small rays. Nearly 100 species are known, chiefly in N. Amer. The receptacle is small and naked; pappus is of white capillary bristles. The genus consists of two sections. Section *Euthamia*,

which comprises the last three quite similar-appearing species, has the leaves linear and the rays rather inconspicuous.

- a. Inflorescence various, from axillary clusters to a panicle or a large elongated compound inflorescence but not in flat or round-topped corymbs; rays usually fewer than the disk-flowers; leaves often lanceolate but not narrowly linear.
- b. Flower-heads in the axils of normal leaves, or with the leafy bracts but little reduced and much longer than the branches of the inflorescence; leaves not triple-nerved.
- c. Involucres 3-6 mm high; rays 3-4, rarely 5-6.
- d. Leaves lanceolate, sessile or tapering to the base; stem smooth, terete, glaucous.
  - 1. *S. caesia*
- d. Leaves ovate, mostly with winged petioles; stem not glaucous, more or less zig-zag, often pubescent near the top (Fig. 130, j).
  - 2. *S. flexicaulis*
- c. Involucres 8-12 mm high; heads in the axils of the normal leaves, widely scattered; lower leaves ovate, coarsely toothed and wing-petioled; cool woods and ravines.
  - 3. *S. macrophylla*
- b. Flower-heads crowded in the axils of much-reduced upper leaves or bracts to form a terminal inflorescence.
  - e. Inflorescence long and narrow or else reduced to a terminal cluster, the branches usually short and stiff and any longer ones erect and appressed, without lateral, arching one-sided racemes.
  - f. Leaves more or less hairy or pubescent on one or both sides; stem densely pubescent above; involucres 3-4.5 mm high.
  - g. Inflorescence stiffly erect, with short branches, the flower-heads not arranged along one side of the branches; pubescence loose or erect, not of grayish incurved hairs; achenes glabrous (Fig. 130, c).
  - h. Pubescence scanty to abundant, soft and spreading; bracts of the involucre broad and obtuse with wide scarious margins and greenish tips (Fig. 130, i).
    - i. Flowers white or cream-colored.
      - 4. *S. bicolor*
    - i. Flowers yellow.
      - 5. *S. hispida*
  - h. Pubescence on the upper part of the stem and the leaves finely puberulent with short, stiff, erect clubbed hairs; bracts of the involucre narrow and acuminate, without wide scarious margins (Fig. 130, d).
    - 6. *S. puberula*
  - g. Inflorescence small, usually curved, the heads strongly secund or arranged along one side of the branches; leaves much reduced towards the top of the stem, with 3 more or less equal veins; stems and leaves uniformly grayish-pubescent with short incurved hairs. (Fig. 130, g).
    - 13. *S. nemoralis*
- f. Leaves and stem below the inflorescence essentially glabrous; involucre 4-7 mm high with the bracts rounded to acute but not long-tipped.
  - j. Achenes persistently hairy or pubescent.
    - k. Heads 30-65-flowered; arctic-alpine species of northern C.B.; rays 12-23; heads in a terminal compact inflorescence; leaves obtuse; plants 1-4 dm tall, villous-puberulent in the inflorescence.
      - 7. *S. multiradiata*
    - k. Heads 10-30-flowered, with 7-10 rays; inflorescence elongated but compact; involucre 5-6 mm high; rare or little known.
      - 8. *S. Randii*
  - j. Achenes usually glabrous; inflorescence ample and elongate with many strongly-ascending cylindric racemose branches, having a brushed-up appearance; large plants of wet ground and bogs with the lower leaves long-petioled.
    - 9. *S. Purshii*

- c. Flower-heads in terminal, usually one-sided racemes, the total forming a large, erect or curved wide compound inflorescence called a thyrse; plants large (Fig. 130, h).
- l. Plants fleshy with thick shiny entire leaves; heads in a large crowded oblong inflorescence; involucre of flower-heads 4-6 mm high; plants of brackish shores. 10. *S. sempervirens*
  - 1. Plants thin and not fleshy; leaves usually toothed; not confined to brackish shores, usually inland.
  - m. Leaves pinnately-veined, not 3-ribbed, although sometimes obscurely appearing so.
  - n. Basal leaves long-petioled, conspicuously larger than the 5-50 stem-leaves (Fig. 131, a).
  - o. Branches of the panicle pubescent; panicle narrow and compact, the branches short and often ascending.
  - p. Plants 4-15 dm high, of wet soils or bogs; stems and leaves smooth or nearly so.
  - q. Inflorescence elliptical or narrower, the branches appressed; heads arranged around all sides of the branches; involucre 4-5 mm high. 9. *S. Purshii*
  - q. Inflorescence more spreading, the heads arranged unilaterally along the panicle branches; involucre 3-4 mm high, the bracts more rigid and incurved. 12. *S. uliginosa*
  - p. Plants 3-6 dm high, of dry soils and barrens; stems and leaves uniformly grayish-pubescent with short incurved hairs. 13. *S. nemoralis*
  - o. Branches of the panicle glabrous; panicle ample, the branches recurved-spreading; involucre 3-5 mm high; rays 8-12. 11. *S. Juncea*
  - n. Basal leaves similar to the 30-100 or more uniform and gradually reduced stem-leaves, usually absent at flowering time; leaves elliptical to lanceolate.
  - r. Stem, branches and leaves essentially glabrous; branches of inflorescence strongly ascending; involucre 4.5-6.5 mm high; leaves widely lanceolate to oblong, tapering strongly to each end. 14. *S. Elliottii*
  - r. Stem, branches and leaves pubescent to long-hairy or villous.
  - s. Flowers mostly in large terminal inflorescence; upper leaves short, not exceeding the branches of the inflorescence. 15. *S. rugosa*
  - s. Flowers scattered on short branches, the panicles exceeded by the surrounding leaves. *S. rugosa* var. *villosa*
  - m. Leaves more or less plainly 3-ribbed, with 2 of the lateral veins becoming prominent and elongated parallel to the midrib; heads in one-sided spreading or recurved panicles, forming an ample thyrse.
  - t. Flowers small, the involucre 2-3 mm high; rays 10-20, small and short (Fig. 131, b); stem pubescent below the inflorescence. 16. *S. canadensis*
  - t. Flowers larger, the involucre 3.5-5 mm high; rays 7-15, larger; stem glabrous below the inflorescence.
  - u. Leaves glabrous or somewhat scabrous above, pubescent at least on the midrib beneath. 17. *S. gigantea*
  - u. Leaves glabrous above and beneath. *S. gigantea* var. *leptophylla*

- a. Inflorescence a flat or round-topped corymb, with the flower-heads sessile or nearly so; leaves linear (Fig. 131, c).
- v. Plants usually branched above; leaves thin, wide-spreading and long-tipped, usually 3-nerved, with sometimes 2 more fine ones.
  - w. Florets 15-45 in a head; plants often finely rough-pubescent; leaves 3-, often 5-nerved.
18. *S. graminifolia*
- w. Florets 12-20, with disk-florets 5-7, rarely 9; plants with tufts of leaves or short branches in the axils of the leaves; leaves only faintly 3-nerved.
19. *S. tenuifolia*
- v. Plants usually unbranched, with a small inflorescence, smooth; leaves thickish, ascending, and blunt; leaves 1-nerved; disk-florets 12-20, with about as many rays.
20. *S. galeatorum*



## 1. *S. caesia* L. BLUE-STEM GOLDENROD

Reported as "scattered in thickets and open woods throughout the north-central region; Macoun lists it from Halifax and the North Mt., near Annapolis; and specimens from oak woods near Kentville belong here." No recent collections have been made and the plant must either be considered as rare and local, or the earlier records may be erroneous. The plant has probably been confused with weak shade-forms of *S. canadensis*.

Central Me. to Wisc. south to Fla. and Tex.; N.S. (?)

## 2. *S. flexicaulis* L. Fig. 130, j. Map 502. WOOD-GOLDENROD

Common in rich woods, on calcareous slopes and alluvial flood-plains from Digby Neck to northern C.B.; rare on the Atlantic side. It is characteristic of climax forests along flood-plains in C.B.; rare in the southwestern counties, so that Fernald (1922) considers a collection from Bridgewater worthy of record. Late July-Aug. (*S. latifolia* L.).

J.S. Erskine (1953) considers a plant found at Amethyst Cove, Kings Co. to be a hybrid with the size and long-branched inflorescence of *macrophylla*, and the shorter petioles, less coarse serration of leaf and small heads of *flexicaulis*.

N.S. and Gaspé west to S.Dak. south to N.C. and Tenn.

3. *S. macrophylla* Pursh Map 503. LARGE-LEAVED GOLDEN-ROD

Scattered in northern C.B. in the coniferous forest; rare in Richmond Co. and at Pirates Cove on the Strait of Canso; in cool woods or ravines in the Cobequids from Folleigh L. to Advocate; and rare at Amethyst Cove near Cape Blomidon. The plants are large and luxuriant in the ravine at Hart Brook in the Wentworth Valley, Colchester Co. Aug.-Sept.

Nfld. and Lab. to L. Superior south in subalpine areas of NewEng. and N.Y.

4. *S. bicolor* L. Fig. 130, c, f. Map 504. WHITE GOLDENROD

Common in dry soil, old fields and barrens over much of the Province; it is a heath pioneer and an early introduction in burnt-over forest in C.B.; rare in Yarmouth and southern Digby Co. Aug.-Sept.

C.B. to Man. south to Ga. and Ark.

5. *S. hispida* Muhl.

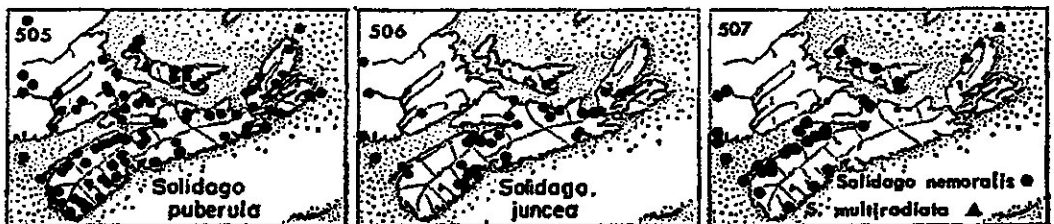
Similar to the last except in the color of the flowers; it is rare and only an occasional specimen is seen. It was reported from Sandy Cove, Digby Co., by D.S. Erskine (1951). (*S. bicolor*, var. *concolor* T. & G.).

Nfld. to Man. south to Ga. and Ark.

6. *S. puberula* Nutt. Map 505. Fig. 130, d, e. ROUGH GOLDEN-ROD

Very common throughout; dry soil, old fields, barrens, exposed headlands and open woods; rarer in the southwestern counties. Form *albiradiata* Schofield and Smith has white instead of yellow rays; reported from a dry roadside near Goat Lake, Lunenburg Co. (1953). Late July-Sept.

C.B. to e. Ont. south to Fla. and Miss.



7. *S. multiradiata* Ait. Map 507.

Collected by Perry and Roscoe from a barren on St. Paul I., northern C.B.; very rare on moist shaded cliff ledges, Big Southwest Brook (Smith and Schofield, 1952); moist ledges along Cheticamp R. and on ledges up Corney Brook.

Nfld. and northern Lab. south to C.B. and Gaspé; Rocky Mts.

8. *S. Randii* (Porter) Britt.

Reported only from Guysborough Co., where Rousseau (1938-a) reports it from a gravelly beach at Guysborough. No specimens of this plant have been seen and the record must remain doubtful until it is verified. The general range of this plant is further south. (*S. sphathulata* DC., subsp. *Randii* (Porter) Cronq.).

Granitic or siliceous rocks and gravels: Me. and northern N.Y. west to Minn.

9. *S. Purshii* Porter

A rather poorly-dê fined species, often much like *S. uliginosa* but in places in northern N.S. quite distinctive and different from it. About Oxford and in neighboring areas it is common in poorly-drained fields, growing vigorously with a dense elliptical inflorescence of pale appearance and erect appressed branches. The inflorescence has a brushed-up appearance quite different from *S. uliginosa*, from which it differs also in chromosome count,  $2n=18$ . Scattered collections are also present from Queens to Victoria Co. from wet soils and boggy locations. Older records probably apply to *S. uliginosa*. Late summer. (*S. humilis* Pursh).

Lab. to Man. south to W.Va. and Wisc.

10. *S. sempervirens* L. SEASIDE GOLDENROD

Found around the whole coast of the Province and on Sable I.; salt marshes and sea-shores just above the range of the high tides. It is abundant on the running dykes and is found on the slopes next to the tidal rivers. A plant from Lockeport, Shelburne Co., showed  $2n=18$  (Beaudry and Chabot, 1959). Forma *ochroleuca* Weatherby with the ray of flowers very pale yellow, almost white, was found scattered in a salt marsh at Parrsboro, Cumberland Co., Aug. 12, 1942 (Weatherby, 1942).

X *S. asperula* Desf. is a hybrid between this species and *S. rugosa* and is more or less intermediate between them. This has been reported from various locations along the Atlantic Coast and in northern N.S. and is to be expected wherever the habitats allow the two species to grow together. Occasional crosses apparently also appear between *S. sempervirens* and *S. canadensis*; and a hybrid with *S. uliginosa* was found on St. Paul I., (Boivin).

Nfld. and the lower St. Lawrence south to Va., with a variety to Fla. and Tex.

11. *S. juncea* Ait. Fig. 131, a. Map 506. EARLY GOLDENROD

Common in northern N.S. and scattered west to Digby and Lunenburg Co. and east to central C.B.; not seen by the Gray Herbarium Expedition in Yarmouth, Shelburne or Queens Co.; rare in C.B. and P.E.I. This is one of the earliest goldenrods of the season. Found on dryish

soils, along roadsides and in fields, with the bright-yellow curving inflorescences large and conspicuous. Late July-Sept.

C.B. to se.Man. south to Ga. and Tenn.

12. *S. uliginosa* Nutt. Fig. 130, h. BOG-GOLDENROD

One of the common goldenrods throughout the more acid and damper parts of the Province from Yarmouth along the Atlantic coast to northern C.B., rarer inland and there more typically only in bogs. It is characteristic of bogs, dryish peaty barrens and even denuded granitic hills. Several varieties have been described. The typical variety consists of the more robust plants with 20-40 stem-leaves. This is recorded for N.S. but is not common, formerly treated as *S. neglecta* T. & G. The more common form is called var. *linoides* (T. & G.) Fern., first named as *S. uniligulata* (DC.) Porter. This is 1-9 dm high with only 5-20 stem-leaves, apparently an adaptation to more severe ecological conditions. In northern C.B. this slender form has the inflorescence 4-5 cm wide, very short and with the branches spreading almost horizontally. This small form with the corymbose inflorescence is named var. *terraenovae* (T. & G.) Fern.; abundant in bog, Ingonish Barrens at an elevation of 1400 feet; common in bog above Gray Glen Brook, both stations in Victoria Co. (Smith and Schofield, 1952).  $2n = 36$  (Beaudry and Chabot, 1959). Aug.-Sept.

Nfld. to Wisc. south to s.Me., N.Y. and s. Mich.

13. *S. nemoralis* Ait. Fig. 130, g. Map 507. OLD-FIELD-GOLDENROD

Local and in general of limited distribution. In the Annapolis Valley it is one of the more common goldenrods of late summer, occupying old fields, sandy roadsides and replacing *S. puberula* on lighter soils. Scattered stations occur southwestward. Fernald (1921) states that it was not seen in Queens and Shelburne Co. and in Yarmouth Co. only at Carleton. It has since been found at Shelburne; and from near Digby. Common on light soils in local areas near Truro; Erskine reports it as more common in eastern P.E.I. The plants are noticeable from a distance because the slender stems are curved at the top in the inflorescence. Aug.-Sept.

N.S. to B.C. south to Ga. and Tex.

14. *S. Elliottii* T. & G. Map 503.

Abundant and often dominant in boggy clearings, swales and damp thickets, spruce and maple swamps and lake shores in parts of Yarmouth Co. east at least to Queens Co. In discussing the flora near Clement Pond near Barrington, Shelburne Co., Fernald (1921) says "the most amazing sight of the day was the acres and acres of the southern *Solidago Elliottii*, forming solid thickets nearly 2 m high in the spruce and maple



swamp." The northern plants from e. Virginia north to Mass. and in southwestern N.S. have been named var. *ascendens* Fern. Mid-Aug.-Sept.

N.S.; Mass. south to eastern Ga.

15. *S. rugosa* Ait. ROUGH GOLDENROD

Common throughout; waste places, along fence-rows, open woods and a weed in old or deserted fields. Var. *villosa* (Pursh) Fern. has the same chromosome number,  $2n = 18$ , as the typical plant and is perhaps better considered to be forma *villosa* (Pursh) Beaudry. This is also frequent throughout in similar habitats but does not apparently range as far south. The plants are very variable in respect to pubescence from rough hairy to nearly glabrous. Consult Fernald (1936) and Beaudry (1960).

Nfld. to Ont. south to Va. and Ohio.

16. *S. canadensis* L. Fig. 131, b. Map 508. CANADA GOLDEN-ROD

This is one of the most common species throughout the northern regions of the Province; fields, roadsides and edges of woods from Annapolis to northern C.B., very rare in the southwestern counties. Fernald (1921) states that "during the whole summer we did not see this characteristic Canadian species in southern Yarmouth Co. nor in Shelburne and Queens Co." Fernald, the next year, reports one clump from Five-River L., Shelburne Co., that was apparently a hybrid between this species and *S. uliginosa*. Around the coast hybrids occasionally occur with *S. sempervirens*; and it can also hybridize with *S. rugosa*. August.

Var. *gilvocanescens* Rydb. has the leaves grayish with dense rough, short hairs on both sides. This was collected by J.F. Donly near Guzzle Head Pond, Mersey R., in Queens Co.; with the statement "rare in Queens Co." Widely distributed but rare eastward in N. Amer.

Nfld. to B.C. south to Va., Ill. and Colo.

17. *S. gigantea* Ait.

Scattered east from Yarmouth Co.; gravelly thicket by Fanning L., Carleton, Yarmouth Co.; and railroad bank, Middleton, Annapolis Co. (Fernald, 1921).

Var. *leiophylla* Fern. has leaves glabrous or nearly so beneath and occurs essentially throughout the range of the species. It is doubtful if it is worthwhile maintaining this variety for the N.S. plants. The leaves of the plants in eastern N.S. are mostly smooth, but there is considerable variation even in leaves on the same plant. The involucres, also, are only about 3 mm high. Both the species and the variety were found by Beaudry to have diploid and tetraploid forms, although the morphological differences have not been worked out. Common on the

intervals and along streams at least from Truro to north-central C.B., often forming luxuriant stands in rich soil. (*S. serotina* Ait.).

N.S. to B.C. south to Fla. and Tex.

18. *S. graminifolia* (L.) Salisb. Fig. 131, c. NARROW-LEAVED GOLDENROD

Common on sandy and gravelly lake-shores, in damp thickets and swamps in the southwestern counties; becoming rarer east to C.B. and grading into the following variety.

Var. *Nuttallii* (Greene) Fern. is apparently more common and most of the plants from cultivated areas examined belong to this type. Here, again, much variation occurs in the pubescence and it is doubtful if the differences have much significance for our area. Aug.-Sept.

Nfld. to Man, south to N.C., and Mo.; B.C.



Fig. 131.—*Solidago*: (a) *S. juncea*, plant  $\times \frac{1}{2}$ , flower  $\times 3$ , (b) *S. canadensis*, top of plant  $\times \frac{1}{2}$ , flower  $\times 3$ , (c) *S. graminifolia*  $\times \frac{1}{2}$ .

19. *S. tenuifolia* Pursh

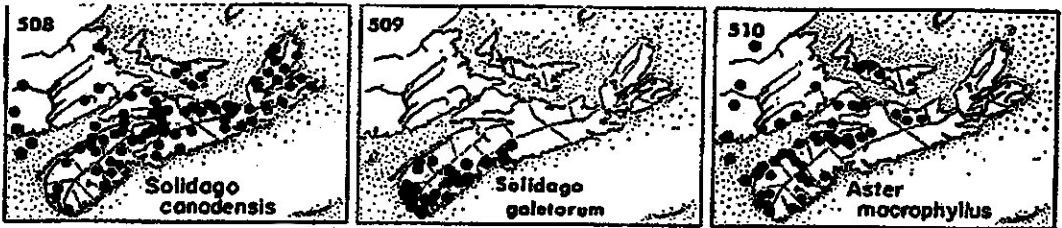
Apparently rare in southwestern N.S. Fernald separates off as this species the larger, more branching plants with spreading thinner leaves: sandy roadside, Sloane L., Pleasant Valley in Yarmouth Co. and gravelly beach of Third L., Windsor Junction in Halifax Co. Further investigation should be made to determine whether one or two species occur in N.S. as this and the following are evidently closely related.

N.S. and Me. south to Va.; n.Ind. and southern Mich.

20. *S. galetorum* Greene. Map 509.

Scattered on sandy and gravelly beaches of lakes and in damp thickets from Digby Co. eastward, becoming rarer in Queens and Lunenburg Co. to Grand L. in Halifax Co. (*S. tenuifolia* var. *pycnocephala* Fern.). Aug.-Sept.

N.S. and perhaps from southern Me. to Cape Cod.



## 4. ASTER L.

The genus *Aster* has perhaps 250 species widely distributed but mostly in N. Amer. The receptacle is flat or slightly convex with numerous florets; rays from blue or pinkish to white; pappus of capillary bristles. The plants are mostly perennial, with simple leaves. The genus is closely related to *Erigeron* and, although there is little trouble in distinguishing between these two genera, they are not separated by any definite morphological characters. One interesting species is *A. laurentianus* Fern. found on brackish sands in north-central P.E.I. This small plant, less than 30 cm high, has the rays almost entirely absent and is related to a far-western species (Boivin, 1962; Shinnars, 1943).

- a. Middle and lower stem-leaves petioled, the blades abruptly narrowed to truncate or cordate at the base.
  - b. Outer involucrel bracts 1.0-2.5 mm wide; peduncles usually more or less glandular; plants with creeping rhizomes, forming large patches, with very large rough leaves (Fig. 132, a).
    1. *A. macrophyllus*
  - b. Outer involucrel bracts 0.2-0.8 mm wide; without glands; plants usually growing singly or in clumps.
  - c. Lower leaves roundish in outline, nearly as wide as long, deeply cordate; involucrel bracts glabrous on the back; leaves not clasping the stem (Fig. 132, d).
    2. *A. cordifolius*

- c. Lower leaves more than twice as long as wide, with sides less rounded, firm, tapering or truncate to the petiole or but slightly cordate.
- d. Involucral bracts glabrous on the back; stem-leaves not clasping at the base; plant without hoary minute pubescence, essentially glabrous.
3. *A. cillolatus*
- d. Involucral bracts pubescent on the back; upper stem-leaves distinctly cordate-clasping at the base; plant with minute hoary pubescence throughout.
4. *A. undulatus*
- a. Middle and lower stem-leaves sessile, or tapering gradually to the base.
- e. Garden escape; tall showy plant with rays reddish-purple or rose, rarely blue or white; leaves conspicuously clasping; involucre over 6 mm high, this and the peduncles densely glandular.
5. *A. novae-angliae*
- e. Plants of native habitats or weedy; inflorescence not densely glandular.
- f. Middle involucral bracts with mid-vein expanded upward into a prominent colored (usually green) tip.
- g. Upper leaves more or less strongly clasping at the rounded base; flowers large, blue to rose-purple.
- h. Plant hispid-pubescent near the top or throughout, coarse and tall; leaves not conspicuously crowded in the inflorescence; involucre 6-12 mm high; rays 30-60.
6. *A. puniceus*
- h. Plant glabrous or pubescent above in lines; plants 10-50 cm high, often with the leaves crowded in the inflorescence; involucre 5-8 mm high.
15. *A. novi-belgii*
- g. Upper leaves tapering to the sessile base or only barely clasping.
- i. Plants rather slender, often diffusely branched; flowers white to pale lavender or pinkish, small, the involucre 3.5-5, occasionally to 6.5 mm long; rays 3-11 mm long.
- j. Involucral bracts, or some of them, subulate with inrolled green tips; plants perennial from a short rootstock; leaves linear to lanceolate, the upper numerous and much reduced; flowers white; rare introductions.
- k. Involucre 4.5-8 mm high, about as broad as high; flower-heads 40-100-flowered; rays 5-10 mm long.
8. *A. pilosus*
- k. Involucre 4-4.5 mm high, narrower than long; heads 16-32-flowered; rays 12-18, small and about 2.5-5 mm long.
9. *A. parviceps*
- j. Involucral bracts flat, with the tips attenuate or acute but not inrolled; flowers often pale bluish or pinkish tinged.
- i. Disk-corollas deeply lobed, the lobes half to three-quarters as long as the total of the expanded part above the narrow corolla-tube; plants without creeping rootstocks, low and diffusely branched.
10. *A. lateriflorus*
- i. Disk-corollas shallowly lobed, the lobes less than half as long and often only a quarter the length of the limb of the corolla; plants with creeping rootstocks.
- m. Plants with stout, creeping rootstocks, growing in large dense colonies, commonly 8-15 dm high; flower-heads very numerous, white to lavender, about 2.5 cm wide; leafy bracts of the peduncles and smaller branches linear to lanceolate, acuminate.
11. *A. simplex*
- m. Plants slender and erect, with loose erect branches, from slender running rootstocks; inflorescence elongate, with flower-heads not one-sided along the branches; flowers few.
12. *A. Tradescanti*
- i. Plants often branched only near the top, 30-100 cm high; involucre 6-9 mm high; flowers blue, larger, with rays 1.5 cm long; plants from short stout rootstocks.

- n. Plants slender with long internodes; flower-heads few; leaves long and linear or nearly so; involucrel bracts in 3 to 5 series, the outer much the shorter. 13. *A. borealis*
- n. Plants stouter, usually branched with numerous flowers; leaves lanceolate or wider; involucrel bracts nearly the same length, the outer as long or longer than the inner.
- o. Involucrel bracts erect or spreading, acute or acuminate at the tip, usually with scarious margins, mostly 1-2 mm wide. 15. *A. novi-belgii*
- o. Involucrel bracts green and foliaceous, the outer longer than the inner and recurved, over 1.5 mm wide. 14. *A. foliaceus*
- f. Middle involucrel bracts without colored tips, or with colored tips not formed by the expansion of the mid-veins.
- p. Involucres more than 6 mm high; plants relatively short, much less than 1 m high; pappus a single series of bristles.
- q. Outer bracts 1.0-2.5 mm wide; lower leaves reduced and soon deciduous, about 2.5 cm wide or less (Fig. 132, b); achenes not glandular; bogs. 7. *A. radula*
- q. Outer bracts narrow, only 0.2-0.8 mm wide; achenes glandular.
- r. Largest stem-leaves 3-12 mm wide; plants with 41-75 leaves below the inflorescence (Fig. 133, b). 16. *A. nemoralis*
- r. Largest stem-leaves 9-50 mm wide; plants with 10-40 leaves below the inflorescence.
- s. Largest stem-leaves 9-24 mm wide; plant with 25-40 leaves below the inflorescence. 17. *A. Blakei*
- s. Largest stem-leaves 20-50 mm wide; plants with 10-20 leaves below the inflorescence (Fig. 132, f). 18. *A. acuminatus*
- p. Involucres less than 6 mm high; plants 1-2 m high; inflorescence flat-topped; rays white; pappus double with an outer series of shorter bristles (Fig. 133, d). 19. *A. umbellatus*

## 1. *A. macrophyllus* L. Fig. 132, a. Map 510. LARGE-LEAVED ASTER

Scattered from Yarmouth east to Pictou Co.; dry woods, thickets and open barrens in the southwest, often growing in light shade in large patches, in many cases rarely flowering. The species is very variable in relation to the pubescence. Var. *velutinus* Burgess has the stems and petioles villous and the under surfaces of the leaves softly hairy; of little significance in N.S. Flowers pale blue to whitish, July 15-Aug.

N.S. to se. Man. south to the uplands of N.C. and Tenn.

## 2. *A. cordifolius* L. Fig. 132, d. Map 511. HEART-LEAVED ASTER

Common from Annapolis to C.B.; thickets, roadsides, fields and about dwellings, often abundant in waste ground and at the edges of fields; sometimes densely branched and floriferous in rich ground. Considerable variation exists in the size of the flowers and inflorescence and in the flower color. Var. *racemiflorus* Fern. has the fewer branches of the panicle long and relatively simple, with slightly larger flowers. Aug.-Oct.

N.S. to Wisc. and Iowa south to Ga. and Ala.

3. *A. ciliolatus* Lindl. Fig. 132, e.

Scattered in open fields in southern Hants Co. and northward between Halifax and Truro; common in the town of Stewiacke and found at Middle Musquodoboit. This plant is deep-green and erect with large bright blue flowers. (*A. Lindleyanus* T. & G.) Aug.-Sept.

N.S. to B.C. south to N.Y. and Mich.

4. *A. undulatus* L.

Scattered in dry open woods and thickets in southern Lunenburg Co. and often invading old fields; Greenfield, in adjacent Queens Co. (Weatherby, 1942).

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



Fig. 132.—Aster: (a) *A. macrophyllus*, inflorescence and leaf  $\times \frac{1}{2}$ , (b) *A. radula*  $\times \frac{1}{2}$ , (c) *A. lateriflorus*  $\times \frac{1}{2}$ , (d) *A. cordifolius*  $\times \frac{1}{2}$ , (e) *A. ciliolatus*, leaf  $\times \frac{1}{3}$ , (f) *A. acuminatus*  $\times \frac{1}{3}$ .

5. *A. novae-angliae* L. NEW ENGLAND ASTER

This tall showy aster is frequently cultivated and occasionally escapes to adjacent fields and roadsides or along hedge-rows and ditches; native further south and west. Aug.-Oct.

N.S.; Que. to Alta. south to the uplands of N.C. and Colo.

6. *A. puniceus* L. Fig. 133, c. Map 512. ROUGH ASTER

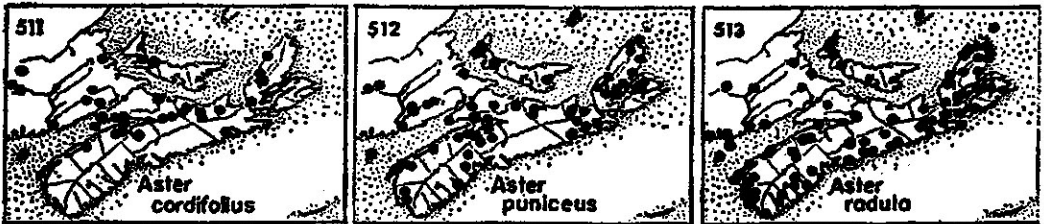
Scattered to common throughout; swamps, wet open areas, edges of swales and along streams, a coarse distinctive species. The rays are usually blue-violet. *Forma candidus* has white rays. *Forma firmus* (Nees) T. & G. has the stem nearly or quite glabrous below the inflorescence. This variation is widespread and is reported from our area. Late July-Oct.

Nfld. to Alta. south to Ga. and Ala.

X *A. tardiflorus* L.

This hybrid was reported by Fernald (1950-b) from a roadside 11 miles north of Truro; it is considered to be a hybrid between the previous species and *A. cordifolius*. The stem-leaves are widely lanceolate and abruptly contracted to winged, partly clasping bases, 8-15 in number below the inflorescence; involucre 6-8 mm high, with blue to blue-violet rays. It has also been collected at Brackley Beach, P.E.I. (D.S. Erskine, 1960).

N.S. to Ont. south to Penn.

7. *A. radula* Ait. Fig. 132, b. Map 513.

Common to scattered throughout; boggy barrens, peaty swales, bogs and damp thickets. It is one of the characteristic plants of the Atlantic side of the Province in its habitat.

Var. *strictus* (Pursh) Boivin is a northern, slender form with only one or several flowers with the bracts of the involucre more herbaceous and acute. This may be found in exposed locations and in northern C.B. July-Sept.

Nfld. and Que. south to the uplands of Va. and W.Va.

8. *A. pilosus* Willd.

This diffusely branched plant with rather small white flowers and narrowly lanceolate to subulate leaves has a wide distribution and is apparently local in western N.S. The record of *A. ericoides* from near

Windsor refers to this species; and a collection of Klawe from a dry meadow, Wedgeport, in Yarmouth Co., may possibly be the same. This species and the next have the involucre bracts, or some of them, with marginally inrolled green tips while those of *A. ericoides* are flat. The stem and leaves are more or less spreading-hirsute in contrast to being densely grayish-pubescent; and the rays are numerous.

N.S. to Ont. and Wisc. south to Ga. and Ark.

9. *A. parviceps* (Burgess) Mack. & Bush.

Well established and scattered over several acres west of Wentworth in Hants Co., first reported as *A. pilosus* var. *pilosus*, see Boivin (1962). This is the only location known in Canada.

Open areas in the mid-western U.S.; introduced into N.S.

10. *A. lateriflorus* (L.) Britt. Fig. 132, c. Map 514.

Common throughout; neglected fields, barrens, roadsides and edges of woods. This tiny much-branched aster with numerous small flowers is one of the abundant autumn-flowering plants. July-late Sept.

Var. *tenuipes* Wieg. has the flower-heads on slender pedicels or branchlets longer than the length of the involucre and more openly arranged instead of being one-sided along the branches; usually with larger heads, the involucre up to 6.5 mm high; and with the leaves not pubescent on the midrib beneath. It is distinct in its extreme form but intermediates occur and it grades into the species. (*A. acadiensis* Shinnery).

N.S. to Man. south to Ga., Tenn. and Ark.

11. *A. simplex* Willd.

Damp thickets, edges of fields and along intervalles, rare in the Annapolis Valley, common in Colchester and Pictou Co. and scattered east to C.B., often growing in large patches with numerous whitish flowers. The freely-branching form with narrower leaves only 3-12 mm wide and the involucre bracts slightly narrower has been named var. *ramosissimus* (T. & G.) Cronq. Its range is much like that of the species. Aug.-Sept. (*A. paniculatus* Lam.).

Nfld. to Sask. south to N.C., Ky. and Kans.

12. *A. Tradescanti* L. Map 515.

Scattered in boggy savannahs, around gravelly and sandy beaches of numerous lakes in southern Yarmouth Co.; Sandy Cove, Digby Neck; Ponhook L., Queens Co.; and east to Bridgewater and in Guysborough Co. (*A. saxatilis* (Fern.) Blanchard).

Southern Nfld. and N.S. west to Mich. and south to New Eng. and northern N.Y.



13. *A. borealis* (T. & G.) Prov.

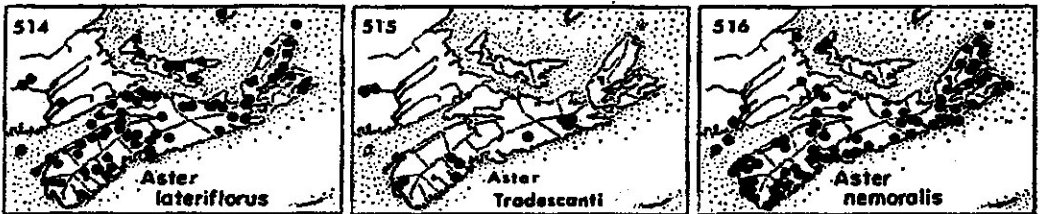
This slender plant with very narrow leaves is found scattered from Yarmouth Co. to C.B.; along brooks, edges of bogs and in damp soil in the cooler parts of the Province; rather rare and but little collected, probably more common than the collections indicate. (*A. junciformis* Rydb.).

N.S. to B.C. south to New Eng. and Ohio.

14. *A. foliaceus* L.

The plants with recurved broad foliaceous involucre bracts over 2 mm wide, simulating upper leaves and herbaceous to the margin, have been named *A. foliaceus* L., var. *arcuans* Fern. Intermediates occur between this and *A. novi-belgii*; and the whole group of blue asters comprising these two species is a difficult one and a number of species and varieties have been proposed. (*A. crenifolius* (Fern.) Cronq. in Britton & Brown; *A. subspicatus* Nees according to Boivin.

N.S. to B.C. south to northern New Eng.

15. *A. novi-belgii* L.

Common in meadows and damp places, especially near the coast and one of the common asters throughout the Province. This species is quite variable and the plants, especially around Truro, vary in the shades of coloring of the flowers. Forma *roseus* Rand & Redf. has the ray flowers roseate or violet. The typical plants have the leaves narrowly lanceolate and rather dull above. On salt marshes in central and western N.S. the plants may be rather tall and the leaves scarcely or not at all clasping at the base.

Var. *litoreus* Gray is found on the sea shores, borders of saline marshes, on headlands and elsewhere in grassy places near the coast. The plant is compact with short internodes and with the leaves larger, more oblong and often broadly based and the bracts of the involucre are relatively broad. These plants have a thickish texture and a shiny appearance to the leaves that is often lacking in the plants of more inland locations. Found from N.S. to Del.

Var. *rosaceus* Rousseau (1942) is the dwarf extreme. The plant grows in a rosette, is less than 15 cm high, with thick wide-based leaves hiding the stem, and the inflorescence compact and scarcely exceeding the leaves; flowers blue. Sable I., around the coast of C.B., and in eastern Que.

Nfld. to Ont. south to New Eng. and Ga.

16. *A. nemoralis* Ait. Fig. 133, b. Map 516.

Common throughout; bogs and marshes, lake margins, and dominant on peaty barrens. The plants are low and wiry, with usually simple stems and one to a few lilac-purple flowers. Forma *albiflorus* Fern. has white flowers; rare.

Nfld. to Algoma, Ont. south to New Eng. and Mich.

17. X *A. Blakei* (Porter) House. Map 517.

Borders of woods and thickets, in damp but sometimes rather dry ground; common in the southern and eastern parts of the Province. It is most often found around the edges of a lake or bog where the habitats of the previous and the following species border each other and it is considered to be a hybrid between them. The characteristics of the plant are intermediate between those of the two supposed parents and in places the hybrid is more common than either of them. (*A. nemoralis* var. *Blakei* Porter).

Nfld. and C.B. to Que. south to N.J.

18. *A. acuminatus* Michx. Fig. 132. Map 518. WOOD ASTER

Deciduous woodlands and thickets, preferring drier soils; common in the northern counties and scattered elsewhere. This is one of the characteristic plants of open woodlands and edges of intervalles in northern N.S. Aug.-Sept.

Nfld. to e. Ont. south in the mts. to Ga. and Tenn.

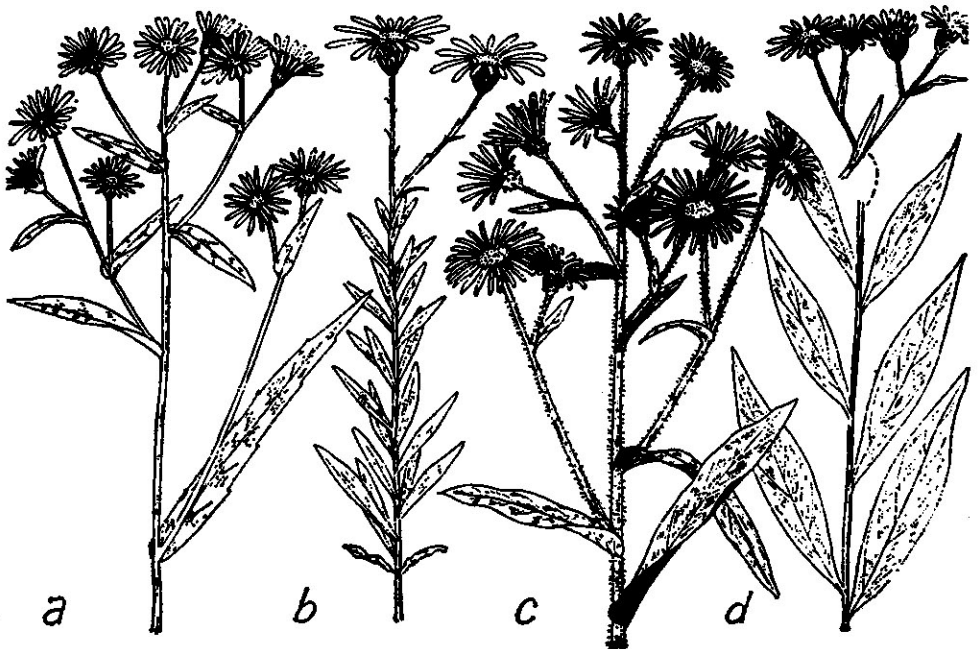
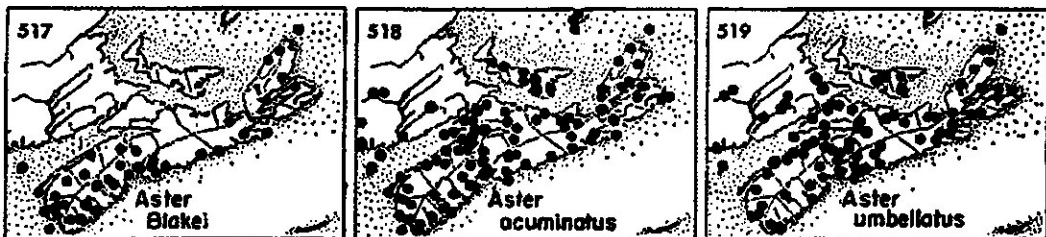


Fig. 133.—Aster: (a) *A. novi-belgii* x  $\frac{1}{2}$ , (b) *A. nemoralis* x  $\frac{1}{2}$ , (c) *A. puniceus* x  $\frac{1}{2}$ , (d) *A. umbellatus* x  $\frac{1}{2}$ .

19. *A. umbellatus* Mill. Fig. 133, d. Map 519. TALL WHITE ASTER

Swamps, damp thickets, marshes and poorly-drained soils; very common throughout along roadsides, in ditches, wet ground and barrens, conspicuous in late summer and often growing with *Solidago graminifolia*; tall with white flowers and identifiable in fruit by its double series of pappus-bristles. Late July-Sept.

Nfld. to Minn. south to the uplands of N.C. and Ky.



## 5. ERIGERON L. FLEABANE

A varied group of nearly 200 species, sometimes difficult to separate technically from *Aster* and with the last species sometimes placed in the related genus *Conyza*; common as weedy species.

- a. Rays much exceeding the disk; heads 15-33 mm wide, solitary or several to numerous in a flattish corymb.
- b. Heads solitary on long peduncles; rays 20-30, whitish to pale pink; plants slender, 2-3 dm high with the numerous leaves linear and 1-4 mm wide; native habitats only (Fig. 134, b).
  1. *E. hyssopifolius*
- b. Heads numerous, with over 50 rays; plants stout, often branched above, 2-15 dm high.
- c. Leaves sessile and clasping; heads 1.5-2 cm wide; rays pinkish, about 0.5 mm wide, up to 150 in number.
  2. *E. philadelphicus*
- c. Leaves sessile, not clasping; heads 1-2 cm wide; rays 60-90, pale pinkish or bluish to white.
- d. Median stem-leaves coarsely toothed, ovate to narrowly lanceolate (Fig. 134, a); stems and leaves sparsely pubescent with long stiff spreading hairs.
  3. *E. annuus*
- d. Median stem-leaves entire or nearly so, linear to narrowly lanceolate, the lower ones toothed at the apex (Fig. 134, d).
- e. Stem and leaves pubescent with numerous short appressed hairs.
  4. *E. strigosus*
- e. Stem and leaves smooth or with scattered long spreading hairs.
  - E. strigosus* var. *septentrionalis*
- a. Rays scarcely exceeding the disk, becoming involute and inconspicuous when dry; heads about 5 mm wide, very numerous in an elongate inflorescence (Fig. 134, c).
  5. *E. canadensis*

1. *E. hyssopifolius* Michx. Fig. 134, b. Map 520

Confined largely to gypsum outcrops; common locally in such locations around Windsor and elsewhere in Hants Co.; in Antigonish Co.; Port Bevis and Cape North in C.B. Nichols (1918) records it from the stream-bank association between flood levels and Hounsell and Smith (1968) as characteristic of damp ledges and cliff crevices in northern C.B. Early July.

Calcareous rocks and gravels; Nfld. to MacKenzie south to N.S., central Me., n. N.Y. and Mich.

2. *E. philadelphicus* L. Map 520. PHILADELPHIA FLEABANE

Rare, known but from three locations; reported by Fernald (1921) from Hectanooga, Digby Co.; seen by J. Adams at Hillsborough, C.B.; large colony in field between Upper Musquodoboit and Dean in Halifax Co. (Smith and Schofield, 1952). Usually found on springy slopes, rich soil or in meadows, June-Aug.

Nfld. to B.C. south to Fla. and Tex.

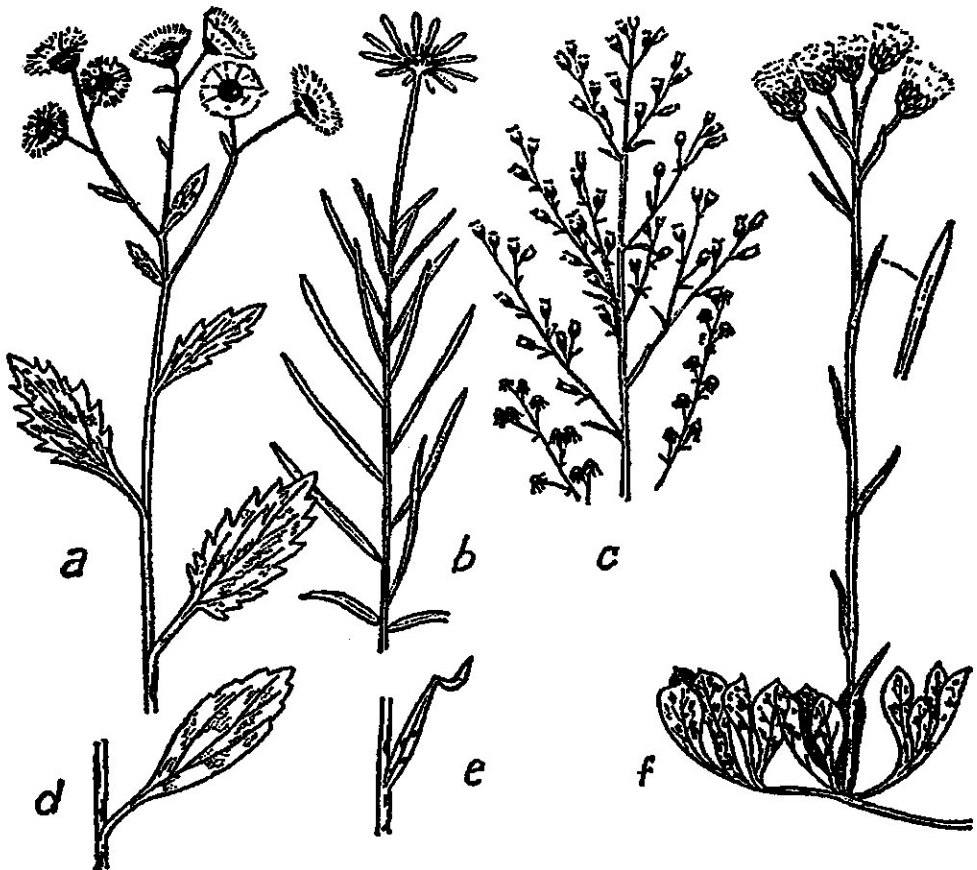


Fig. 134.—*Erigeron*: (a) *E. annuus*  $\times \frac{1}{2}$ , (b) *E. hyssopifolius*  $\times \frac{1}{2}$ , (c) *E. canadensis*, top of small inflorescence  $\times \frac{1}{2}$ , (d) *E. strigosus*, leaf  $\times \frac{1}{2}$ . — *Antennaria*: (e) *A. canadensis*, leaf with appendage  $\times 1$ , (f) *A. neodiolca*  $\times \frac{1}{2}$ .

3. *E. annuus* L. Pers. Fig. 134, a. DAISY-FLEABANE

Common throughout; roadsides, waste places and fields. This and the next species are both very common in hay-fields, sometimes even luxuriant the year after seeding if the land is not properly prepared. July-Sept.

A weed throughout most of n. U.S. and s. Can.

4. *E. strigosus* Muhl. Fig. 134, d. DAISY FLEABANE, WHITE-TOP

Scattered to common in neglected fields, usually a common weed on deserted farms and along roadsides in the central part of the Province, probably introduced from further south and west. Early July-Sept. A weed throughout most of U.S. and southern Can.; introduced into Eu.

Var. *septentrionalis* (Fern. & Wieg.) Fern. is a form intermediate between this species and *E. annuus*, with the pubescence of the stem resembling that of *E. annuus* but with the leaves narrower and but little toothed. Plants are occasionally found along river banks in native habitats; reported from Pictou by Fernald and Wiegand; found along the rocky banks of the Salmon R., Bay St. Lawrence, Victoria Co. and appearing native.

Nfld. to B.C. south to New Eng., Mich. and Calif.

5. *E. canadensis* L. Fig. 134, c. HORSE-WEED

This is a weed of waste places and of light soil, becoming common in parts of the Province and especially in the Annapolis Valley; often in strawberry fields where it grows as a tall coarse annual 1-1.5 m high. (*Conyza canadensis* (L.) Cronq.). July-Sept.

A weed throughout the U.S. and Can.; widely introduced elsewhere.

## 6. ANTENNARIA Gaertn. EVERLASTING

The *Antennarias* comprise a readily recognized group but the species and varieties are difficult to delimit. Most partly or wholly produce their seeds without fertilization. Cronquist, in the New Britton and Brown Illustrated Flora, places all of our common plants in one species with several varieties. Fernald has described a number of species. The characters are sometimes difficult to see and even more difficult to evaluate. The treatment of Fernald (1945-a) is followed here until population studies in our area give a better idea of the range of variation found.

- a. Rosette leaves comparatively small, 0.3-2.0 cm wide, with only the midrib prominent to the tip.
- b. Middle and upper stem leaves terminated by a flat or involute papery appendage (Fig. 134, e); rosette leaves tapering and acute at the tip, very rarely rounded.
- c. New rosette leaves bright green and glabrous or soon becoming so on the upper surface.

1. *A. canadensis*

- c. New leaves grayish- or silky-woolly on the upper surface. 2. *A. neglecta*
- b. Middle and upper stem-leaves acute or terminated by a sharp awn-like tip, but not by an appendage; rosette leaves mostly rounded at the end, with a very small pointed tip.
- d. Involucre of pistillate plants 6-9 mm high, of the staminate plants 5-7 mm high; heads in a compact inflorescence; leaves equally spaced on the stem, and all ending merely in an acute tip; stolons short, quickly developing rosettes.
- e. Leaves more or less whitish-woolly and dull above.
- f. Tips of the involucre bracts linear-oblong, mostly blunt and shining white.
- g. Plants slender to 4 dm high; stem-leaves to 4 mm wide, becoming well separated; basal leaves 5-18 mm wide; corollas 3.2-5 mm long.
3. *A. neodioica*
- g. Plants stout, to 5 dm high; stem leaves 3-8 mm wide, often overlapping; basal leaves larger and greener; corollas 4.8-6 mm long.
- A. neodioica* var. *grandis*
- f. Tips of the involucre bracts tapering with a sharp or acute tip, thinner and much duller. *A. neodioica* var. *attenuata*
- e. Leaves of the rosette glabrous, green and shining above. *A. neodioica* var. *chlorophylla*
- d. Involucre 7-11 mm high; heads in a loose inflorescence, with the lower pedicel often much longer than the upper; upper part of the stem bare or nearly bare of leaves, the upper stem-leaves terminating in a long point; stolons long and only tardily developing rosettes of leaves.
4. *A. petaloidea*
- a. Rosette leaves large, 1-7 cm wide, with 3-7 somewhat prominent long ribs beneath. 5. *A. Parlinitii*

1. *A. canadensis* Greene Fig. 134, e. Map 521. PUSSY'S-TOES, EVERLASTING

Common throughout; hills, dry and sterile soil, old pastures and deserted fields. This and related species often grow in leached-out soils where little other vegetation exists. (*A. neglecta* var. *Randii* (Fern.) Cronq.). May 15-June.

N.S. to Man. south to N.Y., mts. of Va. and Mich.



2. *A. neglecta* Greene

Scattered around Truro and probably generally distributed. If the character of the stem-leaves is disregarded, then these plants are like *A. neodioica*. Cronquist uses this name for this species but considers that the plants Greene described were those we treat under *A. petaloidea*.

One of the usually abundant species from N.S. to Minn. south to Va. and Ohio.

3. *A. neodioica* Greene Fig. 134, f. EVERLASTING

Scattered to common throughout in sterile soils on old fields, pastures, roadsides and rocky barrens. Nfld. to B.C. south to Va. (*A. neglecta* var. *attenuata* (Fern.) Cronq.).

Var. *attenuata* Fern. is common throughout in gravelly thickets, stony pastures, fields, roadsides and on sterile soil. Nfld. to Wisc. south to Va. Var. *grandis* Fern. is not uncommon, especially in the Annapolis Valley, and scattered in southwestern N.S. N.S. to Mich. south to Mass. Var. *chlorophylla* Fern. is rather similar in appearance to *A. canadensis*. It is reported by Fernald (1921) from pasture fields at Yarmouth; and from mixed woods and moist thickets, Meteghan, Digby Co. June. Nfld. to Wisc. south to N.S., New Eng. and N.Y.

4. *A. petaloidea* Fern., var. *subcorymbosa* Fern. Map 522.

Scattered, probably throughout; railroad embankments, sandy thickets, gravelly banks and fields, usually growing in better soils and more shady locations than the other species. Late May and June. The variety has a more northeastern range.

Nfld. to Ont. south to Mass.

5. *A. Parlirii* Fern.

Reported (Fernald, 1922) as "abundant at the border of dry pine and oak woods on steep slopes along the LaHave River, Bridgewater." Not common. Hants Co.: on gypsum cliffs, Halfway River; on dry bluffs, Kennetcook R.; Kings Co.: open wooded bluff above Gaspereau R. at Melanson. In the case of the first two collections, all plants were sterile (Smith and Erskine, 1954). Other broad-leaved forms observed probably belong to this species. Records earlier of *A. plantaginifolia* probably refer to *A. neodioica*. (*A. plantaginifolia* (L.) Richards., var. *arnoglossa* (Greene) Cronq.).

N.S. and southern Me. to se. Man. south to Ga. and Iowa.

## 7. ANAPHALIS DC. PEARLY EVERLASTING

About 25 species, mostly in eastern Asia. Of these, we have only one but it is a common, conspicuous and variable species. A number of varieties have been described. All of these are wide-ranging and intermediates are common although the extremes seem quite distinct.

- a. Leaves rather broadly linear-lanceolate, 3-20 mm wide, not reduced in length just below the inflorescence, bluntish to acute.
- b. Plants 2-9 dm high; leaves becoming bright green and glabrous above; heads numerous, in an open corymb. 1. *A. margaritacea*
- b. Plant dwarf, 1-5 dm high; leaves slightly woolly above; heads showy, few in a crowded cluster. var. *subalpina*
- a. Leaves numerous and linear, 1-5 mm wide, much reduced in length upward towards the inflorescence.
- c. Leaves bright green and glabrous above. var. *angustior*
- c. Leaves cobwebby or flocculose on both sides. var. *intercedens*

1. *A. margaritacea* (L.) C.B. Clarke Fig. 135, a. PEARLY EVER-LASTING

This northern plant is scattered in northern C.B. where the clumps of green, leafy plants are conspicuous. Plants from around Northumberland Strait are not so typical and have a slight tomentum. Common in eastern Asia and northwestern N. Amer.; Nfld. to New Eng. and Minn.

Var. *subalpina* Gray is a western form in the Rocky Mts., occurring eastward on the mts. of Que., Nfld. and other cool areas. St. John (1921) states that it is very common on the dry dunes and barrens on Sable I., where other varieties of the species are apparently absent.

Var. *angustior* (Miquel) Nakai is occasional throughout N.S. Throughout the range of the species.

Var. *intercedens* Hara is the common form of the plant in N.S.; common on dry hillsides, newly-cleared areas, along stone walls and the borders of woods. Aug.-Sept. Nfld. to Alaska south to Va., Mich. and N. Mex.; northern Japan.

8. GNAPHALIUM L. CUDWEED

Erect simple and scattered plants without enlarged basal leaves; technically distinguished from the previous two genera in having all the florets fertile, the outer ones pistillate and the few inner perfect.

- a. Plants often much-branched; heads in a flat-topped corymb, or else in a very irregular diffusely-branched inflorescence; bristles of the pappus separate.
- b. Plants stout, erect; heads ovoid, clustered at the ends of the branches; achenes smooth.
  - c. Leaves wide at the base and prominently decurrent on the stem; stem glandular-hairy; bracts of the receptacle yellow-white, acutish. 1. *G. Macounii*
  - c. Leaves tapering to the base, not decurrent on the stem; stem woolly, scarcely glandular; bracts white, rather obtuse (Fig. 135, c). 2. *G. obtusifolium*
- b. Plants low, diffuse, and becoming prostrate; heads small, exceeded by the leaves; achenes scabrous; involueral bracts light-brown (Fig. 135, d). 3. *G. uliginosum*
- a. Plants erect, unbranched, the heads in small clusters on short branches of the inflorescence in the leaf-axils, forming a spike-like raceme; bristles of the pappus united at the base into a ring (Fig. 135, b). 4. *G. sylvaticum*

1. *G. Macounii* Greene Map 523.

Rare, an early record for N.S. is a specimen collected by How at Windsor; now found scattered in south-central N.S. from Truro to Annapolis and Queens Co.; collected by Fernald on the North Mt., Granville, Annapolis Co. and Five-R. Lake, Halifax Co. Schofield (1949) reports it as growing sparingly scattered in a recently cultivated field at Cambridge, Kings Co., probably introduced in grain seed. D. S. Erskine (1960) reports it as abundant in clearings, and poor fields in southeastern uplands in P.E.I.

P.E.I. and Que. to B.C. south to N.S., Penn., Minn. and N. Mex.



2. *G. obtusifolium* L. Fig. 135, c. Map 524. CATFOOT

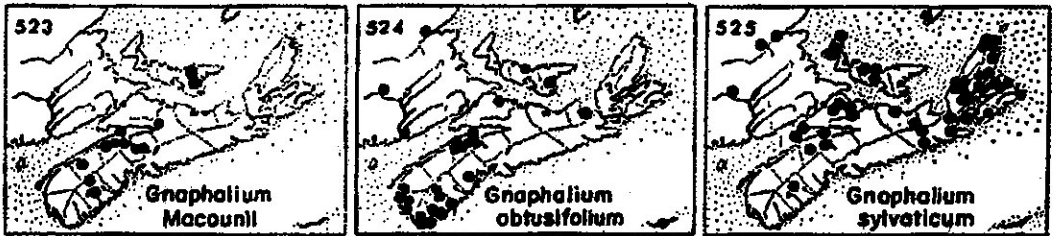
Scattered on dry sandy or rocky places in the western part of the Province: common in Kings Co.; with scattered locations north and east; Sable I., never abundant but probably becoming more common. Aug.-Sept.

N.S. to Ont. south to Ala. and La.

3. *G. uliginosum* L. Fig. 135, d. LOW CUDWEED

Common and weedy throughout; abundant in poorly-drained cultivated fields and gardens and especially so in wet years in grain fields. June-Oct.

Nfld. to B.C. south to Va., Ind. and Colo.

4. *G. sylvaticum* L. Fig. 135, b. Map 525.

Scattered in clearings and along grassy roadsides; common in C.B. and becoming rarer west to Cumberland and Kings Co., often appearing as if native. The only report from the southwestern area is as rare on roadside near Devonshire, Queens Co. (Smith and Erskine, 1954). Aug.-Sept.

Nfld. to Ont. south to n. New Eng.; Eu.

## 9. INULA L.

A tall, sunflower-like plant with large, coarse leaves which are densely whitish woolly beneath; flowers yellow with numerous very narrow rays.

1. *I. Helenium* L. Fig. 135, f. Map 526. ELECAMPANE

Introduced from Europe by the early French settlers; scattered from Yarmouth to central C.B., often found along damp roadsides and as an escape in neighboring fields in the Annapolis Valley especially around Annapolis and near Windsor, and probably still spreading; beach of Bras d'Or L. near Whycocomagh. Aug.

Introduced from Eu.; N.S. to Minn. south to the Gulf States.

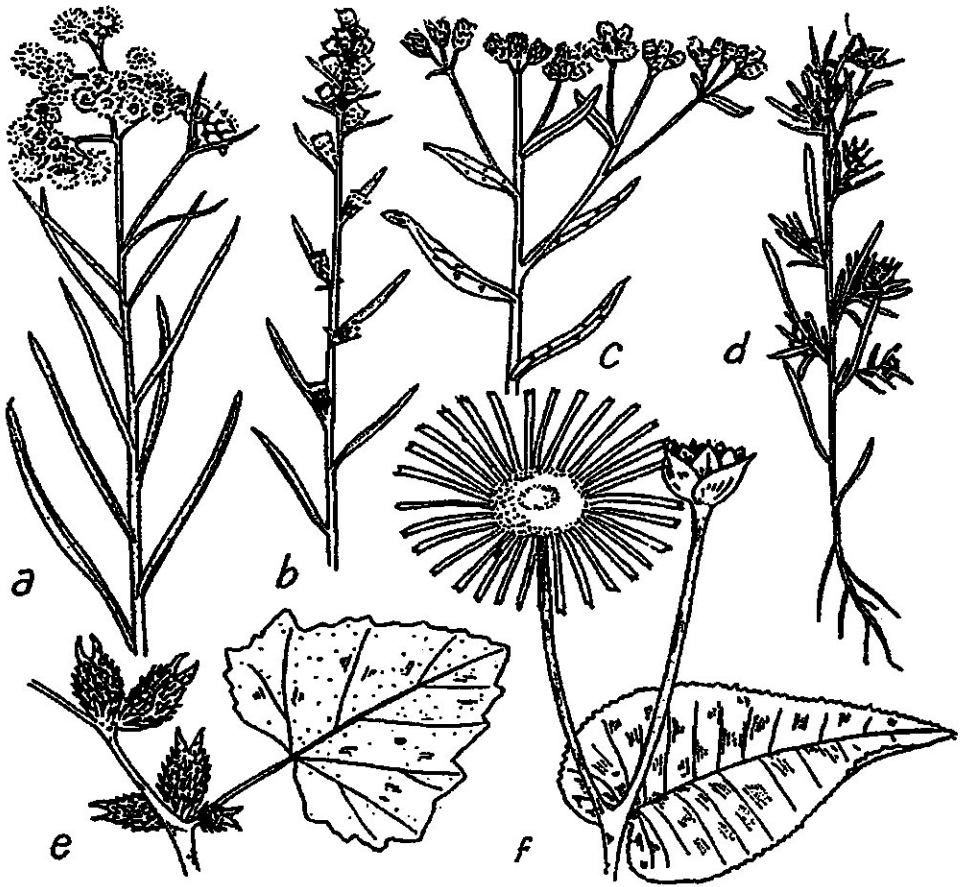


Fig. 135.—Anaphalis: (a) *A. margaritacea*  $\times \frac{1}{2}$ . — Gnaphalium: (b) *G. sylvaticum*  $\times \frac{1}{2}$ , (c) *G. obtusifolium*  $\times \frac{1}{2}$ , (d) *G. uliginosum*  $\times \frac{1}{2}$ . — Xanthium: (e) *X. echinatum*, fruits and leaf  $\times \frac{1}{2}$ . — Inula: (f) *I. helenium*, top of branch  $\times \frac{1}{2}$ .

## 10. IVA L.

Coarse plants with mostly opposite leaves and small discoid flowers either in panicles or in the axils of the upper reduced leaves.

- a. Low shrubby perennial near salt marshes; leaves lanceolate, tapering to a short petiole, fleshy; heads solitary in the axils of the upper reduced leaves.
1. *I. frutescens*
- a. Tall annual, weedy; leaves broadly ovate, long-petiolate, thin; heads numerous, not in the leaf-axils.
2. *I. xanthifolia*

1. *I. frutescens* L., var. *oraria* (Bartlett) Fern. & Grisc. MARSH-ELDER

Undoubtedly introduced; rapidly spreading along road embankments and salt marsh near the mouth of the Gaspereau R. at Avonport

and also on the dykes at Peneau and Grand Pré in Kings Co.; found also on the bar below Yarmouth in Yarmouth Co. Our variety is the more northern one.

N.S. and Mass. to Va. on salt marshes.

## 2. *I. xanthifolia* Nutt.

Introduced around chicken-yards where western grain is scattered; rather common, tall and luxuriant but not found outside this habitat. Aug.-Sept.

Western N. Amer. and introduced eastward.

# 11. AMBROSIA L. RAGWEED

Coarse annual or perennial herbs with mostly lobed or dissected leaves; staminate flowers small and discoid, of numerous stamens surrounded by an involucre, in bractless racemes; pistillate flowers few, in the axils of the leaves, consisting of solitary pistils with no pappus and surrounded by a closed involucre with a few tubercles at the apex. This genus is the main one responsible for the autumn hay-fever in this region.

a. Plants 1-2 m high; leaves deeply 3-lobed or undivided.

1. *A. trifida*

a. Plants 2-10 dm high; leaves finely lobed or divided.

b. Plant annual, without running rootstocks; fruit ovoid, with about 6 acute teeth around the upper margin.

2. *A. artemisiifolia*

b. Plant perennial with slender running rootstocks; fruit with the teeth or tubercles very small or absent.

3. *A. psilostachya*

## 1. *A. trifida* L. GREAT RAGWEED

Sparingly introduced around towns and ports, occasionally seen in rich soil: Dartmouth, Kentville, Parrsboro, North Sydney, and more commonly in the country around buildings near Northumberland Strait.  $2n=24$ . Late summer.

Introduced from the west and south; widely distributed.

## 2. *A. artemisiifolia* L. Fig. 136, a. COMMON RAGWEED

Ragweed occurs on light soil; it is common in the Annapolis Valley, scattered along roadsides in newly disturbed soil to Digby, rare elsewhere inland except where introduced formerly in scratch-grain; found along the sea-coast in the sand and cobble-stones of the upper part of the beaches; occasional from Yarmouth to Halifax, rare from Halifax east and in C.B. Two varieties have been described but are difficult to evaluate. The typical variety has the leaves coarsely lobed with the staminate involucre 3-7 mm broad. This is thought to be native from Nfld. south to D.C.  $2n=36$ .

Var. *elatior* (L.) Descourtils has the leaves as more divided with narrower segments and the staminate involucre 1.5-5 mm broad. The

common introduced weed. Aug.-Sept., sometimes luxuriant in rich soil, often flowering in unfavourable habitats when only a few inches high.

Southern Can. south to Fla. and Tex.

3. *A. psilostachya* DC., var. *coronopifolia* (T. & G.) Farw.

Sparsely introduced into the Maritime Provinces and doubtfully persisting; collected by H. Groh in an orchard at South Berwick, Kings Co. (*A. coronopifolia* T. & G.).

N.S. to B.C. southward.

## 12. XANTHIUM L. COCKLEBUR

Coarse sea-shore annual with wide rough leaves and oblong burs with hooked spines.

1. *X. echinatum* Murr. Fig. 135, e. Map 527. COCKLEBUR

Sandy and gravelly beaches along the Northumberland Strait and western C.B., occasionally found around the Bras d'Or L. This plant usually grows just above the high-tide level but it sometimes extends up from the beaches into low areas in cultivated fields. Hybridization may occur and local strains become established. Löve and Dansereau (1959) place all the plants in one species so that our plants then would only be a form of *X. strumarium* L.

N.S. to Va.; cosmopolitan in the larger sense.

## 13. RUDBECKIA L. CONEFLOWER

Perennial plants with yellow to orange, daisy-like flowers with the receptacle raised and conic or columnar in shape.

- |   |                        |
|---|------------------------|
| a. Disk of the flower greenish-yellow; leaves large and mostly lobed; stem 10-25 dm high (Fig. 136, c). | 1. <i>R. laciniata</i> |
| a. Disk of the flower dark brown; leaves lanceolate, unlobed; stem to 10 dm high (Fig. 136, b).         | 2. <i>R. serotina</i>  |

1. *R. laciniata* L. Fig. 136, c. Map 527. CONEFLOWER

Plants collected by H.G. Perry in an alluvial soil close to the shore of Black River, tributary to the Gaspereau in Kings Co., have been named var. *gaspereauensis* Fern. (Fernald, 1922). The variety has since been found in swales, roadside swamps, and in gulleys at various places in Kings, Hants and Colchester Co., usually rare but occasionally growing in large colonies or spreading over considerable areas. The value of this variety is doubtful, although D.S. Erskine (1960) points out that the plants of P.E.I. are scabrous on the lower surface of the leaves instead of being soft-pubescent. Aug.

The cultivated golden-glow, with a double head, is var. *hortensis* Bailey. This is persistent and occasionally found as an escape or as a relic around house-sites.

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

2. *R. serotina* Nutt. Fig. 136, b. BLACK-EYED SUSAN

This species has been separated from *R. hirta* L. and some 15 dubious varieties and forms have been described. There is considerable gradation in the amount and form of the pubescence on the lower surface of the leaves. The typical variety has the hairs variously spreading and with open smooth spaces between their bulbous bases. This is rare and grades into the next form with the hairs crowded and appressed with minute bulbous bases.

Var. *sericea* (T.V. Moore) Fern. & Schub. is common throughout the Annapolis Valley and scattered east to C.B., rare in the southwestern



Fig. 136.—Ambrosia: (a) *A. artemisiifolia*  $\times \frac{1}{2}$ . — Rudbeckia: (b) *R. serotina*  $\times \frac{1}{2}$ , (c) *R. laciniata*, flower and leaf  $\times \frac{1}{2}$ . — Bidens: (d) *B. cernua*, flowers  $\times \frac{1}{2}$ , achene, (e) *B. frondosa*, top of plant  $\times \frac{1}{2}$ , achene.

counties. Large colonies grow along the railroad between Halifax and Mt. Uniacke; and considerable areas often persist for a long time in suitable locations. There is a variation also in the length of the rays. Most are less than 3.5 cm long. Plants with rays 3.5-5 cm long have been named var. *lanceolata* (Bisch.) Fern. & Schub.

Man. to Texas, naturalized as a weed in eastern N. Amer.

## 14. HELIANTHUS L. SUNFLOWER

Various species of sunflower may occasionally be introduced from western N. Amer. and occur as garden escapes or in waste ground. The following are rare; others may also be expected.

- a. Annual; receptacle flat or nearly so; disks of the flower-heads over 2.5 cm wide; running rootstocks and tubers absent; lower leaves wide, often cordate at the base.
  - 1. *H. annuus*
- a. Perennials, with creeping rootstocks and thus growing in patches; flower-heads with the disk usually less than 3 cm wide.
  - b. Bracts of the involucre lanceolate and greatly overlapping, firm and closely appressed; leaves mostly opposite and triple-nerved; stems and leaves scabrous.
    - 2. *H. laetiflorus*
  - b. Bracts of the involucre narrowly lanceolate, little overlapping, and some or all with acuminate or attenuate spreading tips.
    - c. Leaves broadly lanceolate to ovate, triple-nerved, mostly alternate; well-developed tubers on the rhizomes.
      - 3. *H. tuberosus*
    - c. Leaves lanceolate, at least 3 times longer than wide and not over 4 cm wide; rhizomes often thickened but without prominent tubers.
      - 4. *H. giganteus*

### 1. *H. annuus* L. SUNFLOWER

Occasionally seen as an escape in waste places and around chicken-yards; neither common nor persisting. A common garden plant or ornamental.

Minn. to Texas and westward; introduced eastward.

### 2. *H. laetiflorus* Pers., var. *rigidus* (Cass.) Fern.

Introduced as an ornamental and occasional as an escape; Port Williams, Kings Co.; common at the head of the dykelands in waste ground at Truro; probably elsewhere.

Dry prairies, with scattered introductions eastward.

### 3. *H. tuberosus* L. JERUSALEM ARTICHOKE

Occasional in waste places; rather common in the orchards of the Annapolis Valley on various types of soil; less common than formerly since more orchards are under grass culture.

Throughout eastern and central N. Amer.; introduced eastward.

### 4. *H. giganteus* L.

This species comprises the plants with narrow, spreading bracts of the involucre and with narrow leaves. Other closely related species

are probably occasionally introduced as adventives. Collected by Erskine and Bentley beside the bridge at Mabou, Inverness Co., C.B., and a few plants on an old dump at Yarmouth, 1951.

Que. to Ont. and southwestward; introduced in the Maritimes.

## 15. COREOPSIS L.

Our only representative is an erect, delicate plant with linear leaves and a few radiate flowers with pink rays.

### 1. *C. rosea* Nutt. COREOPSIS

Scattered to often common on wet shores and cobbly or sandy beaches and margins of lakes and streams in the Tusket Valley, Yarmouth Co.; unknown elsewhere in the Province. Late July-Aug.

N.S.; Mass. to southern N.J. and Penn.

## 16. BIDENS L. BEGGAR-TICKS

Our species are annual herbs with opposite leaves; heads radiate or discoid; achenes quadrangular to flattened with usually 2-4 teeth which may be retrorsely barbed (Sherff, 1937).

- a. Leaves simple and toothed, or the lower divided and lobed with the terminal leaflet on a widely-winged stalk; heads discoid or radiate; achenes often striate.
- b. Leaves sessile, or the lower sometimes with a narrowed base.
- c. Flower-heads hemispheric, the disks 12-25 mm wide, often nodding in age; outer bracts reflexed or scarcely ascending; rays 6-8, up to 1.5 cm long, sometimes wanting; (Fig. 136, d); achenes obscurely striate.
  - 1. *B. cernua*
  - 2. *B. hyperborea*
- c. Flower-heads narrower, the disks 5-15 mm wide; outer bracts erect or ascending; rays to 1.2 cm long or wanting; achenes coarsely striate; estuarine.
  - 3. *B. tripartita*
  - 4. *B. vulgata*
- b. Leaves with distinct but sometimes winged petioles 1-4 cm long; rays when present less than 8 mm long.
  - 5. *B. frondosa*
  - 6. *B. discolor*
- a. Leaves compound with the terminal leaflet plainly stalked; rays absent, or small and inconspicuous (Fig. 136, e); achenes not striate.
- d. Outer involucrel bracts 5-16, evenly and copiously fringed with white hairs.
  - c. Outer involucrel bracts 10-16; inner bracts shorter than the disk; achenes brown or olivaceous, the body 6-12 mm long and the awns downwardly barbed.
  - c. Outer involucrel bracts 5-8; inner bracts equal to the disk; achenes blackish, 6-10 mm long.
  - d. Outer involucrel bracts 3-5, mostly 4, not plainly fringed; body of the achene 3-6.2 mm long, the awns barbed upwardly.

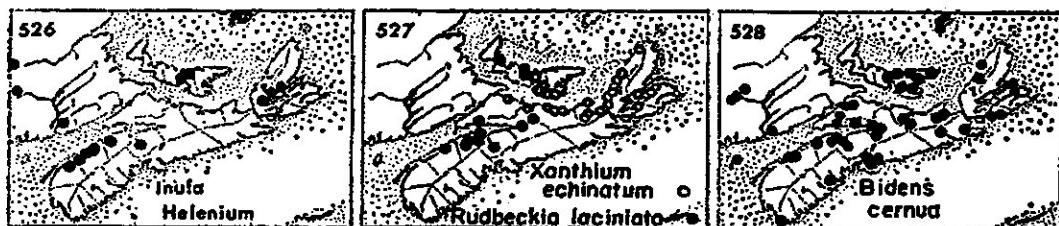
### 1. *B. cernua* L. Fig. 136, d. Map 528. NODDING BUR-MARI-GOLD

Conspicuous and common in springy land, swamps and wet thickets, along brooks and near streams, from Annapolis and Lunenburg Co. to northern C.B. July-Sept. Highly variable in size, and in leaf shape

and serration. The form without rays may be called *forma discoidea* (Wimm. & Grab.) Briq. & Cavill., but it is often as common as the ligulate form.

*Forma minima* (Huds.) Larss. is the smallest extreme; boggy margin of Hebb's L., Bridgewater (Fernald, 1922); bog at the margin of the sea at Gabarus, C.B. (Rousseau, 1938); a large colony on the sandy shore of L. Ainslie at Kenloch, Inverness Co. (Smith and Schofield, 1952). Stem less than 20 cm high, simple or nearly so; heads solitary or few, erect or nearly so in fruit.

N.S. to B.C. south to N.C., Mo. and Calif.; Eurasia.



2. *B. hyperborea* Greene, var. *colpophila* (Fern. & St. John) Fern. Map 529.

Tidal mud-flats of the River Philip, Oxford. This rare estuarine plant is also variable with the plants in each part of its range being slightly different. This variety occurs from the Northumberland Strait of N.B. and N.S. south to Mass.

James Bay; Gaspé; Northumberland Strait to Mass.

3. *B. tripartita* L. Map 530. SWAMP-BEGGAR-TICKS

This plant, also known as *B. comata* Muhl., is now considered to be very much the same as the European species. Various varieties and forms have been described but these are probably mostly ecological variations. Plants with the blade of the leaf 3-parted are rare: thickets and swales back of brackish shore of the LaHave R. at Bridgewater (Fernald, 1922). Most of our plants have the petiole not winged and the blade not divided except in very vigorous plants. Boggy swales, borders of ponds and ditches in various parts of the Province; frequent at the borders of fresh-water ponds on Sable I. *Forma anomala* (Farw.) Boivin has the awns of the achenes retrorsely barbed. Plants occurring locally in P.E.I. and the Magdalen I. have the central achenes flattish instead of quadrangular and with obscure midribs. These belong to var. *heterodoxa* Fern.

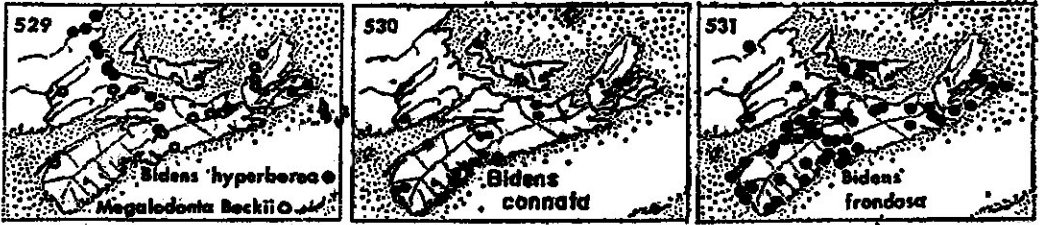
N.S. to Minn. south to Del., Md. and Ohio.

4. *B. vulgata* Greene. BEGGAR-TICKS

Common in ditches and around the dykelands at Truro; a vigorous, distinctive weed.

N.S. to Alta. and Wash. south to N.C., Kans. and Calif.





5. *B. frondosa* L. Fig. 136, e. Map 531. COMMON BEGGAR-TICKS

Common throughout, often growing in shade around dwellings and as a solid cover in damp waste places. In rich soil it is high and much-branched while in exsiccated soil it may be but a few inches high with a simple stem and few heads. Nfld. to Ont. and B.C. south to Fla. and Calif.

*Forma anomala* (Porter) Fern. has the awns of the achenes upwardly barbellate instead of the opposite. This is rather common from Yarmouth Co. along the Bay of Fundy to Amherst and usually grows along the edges of brackish areas, occasionally elsewhere. The plant known as var. *pallida* Wieg. is poorly understood. It has pale-green leaves, the side-branches longer than the main stem, and the terminal leaflet tends to be stalked. Fernald (1950-a) suggests that this may be a hybrid of this species with *B. connata*. Sherff reports this as collected by Brother Peter at Halifax in 1896.

6. *B. discoidea* (T. & G.) Britt.

Scattered in swamps and gravelly or sandy shores near Pictou, probably local in the north-central region of the Province. Sherff lists it only from beaches at Pictou. July-Aug.

Ala. to Texas north locally to N.S., Que. and Ont.

17. MEGALODONTA Greene

This plant is sometimes included with *Bidens*; submerged leaves filiformly dissected and the exposed ones simple; achenes almost terete.

1. *M. Beckii* (Torr.) Greene Fig. 137, a. Map 529. WATER-MARIGOLD

Dead water of Rocky Brook north of Hasset, Digby Co., for the first record east of Penobscot, Me. (Fernald, 1922); wrack of Mattatall Lake, Cumberland Co. (Schofield, 1955); Colchester Co. and from the Musquodoboit R. in Halifax Co. east through Pictou and Antigonish Co. to C.B. where it is abundant in slow-flowing streams about Lake Ainslie and in ponds to the north. In only 2 cases was it found in flower (Smith, 1959). Aug.

N.S. and Que. to Sask. south to N.J. and Ohio; B.C. to Oreg.

## 18. GALINSOGA R. &amp; P.

1. *G. ciliata* (Raf.) Blake QUICKWEED

Common along the streets of Halifax; now becoming introduced at widely scattered places elsewhere, usually about towns. The heads are small with several florets and 4-5 small white rays; plant annual, low and branched, with hispid, often glandular, hairs so that the plant soon becomes dirty in appearance. June-Oct.

Introduced from tropical Amer.; widespread.

## 19. ACHILLEA L. YARROW

Perennial herbs with alternate, subentire to finely and pinnately dissected leaves and many small flowers with whitish to pink rays.

- a. Leaves lanceolate, simple, finely toothed; corymb very loose and leafy, with heads few on long pedicels. 1. *A. Ptarmica*
- a. Leaves finely divided; corymb more compact, the heads numerous on short pedicels.
- b. Rays and disk-florets grayish white.
- c. Bracts of the receptacle with dark brown to blackish margins; plants short with 4-9 stem-leaves, northern. 2. *A. borealis*
- c. Bracts of the receptacle pale, rarely dark-margined; plants larger and vigorously sprëading by underground rootstocks, with 5-20 stem-leaves; common. 3. *A. lanulosa*
- b. Rays or disk-florets, or both, pinkish to red. 4. *A. Millefolium*

1. *A. Ptarmica* L. SNEEZEWEED

Scattered throughout as an escape from gardens and persistent in patches when once established. Double showy forms may also be seen occasionally where recent escapes appear. July-Sept.

Naturalized from Eu.; Nfld. to Ont. south to N.Y. and Mich.

2. *A. borealis* Bong.

The usual weedy character of the genus was not evident in collections from northern C.B. and Cumberland Co. The plants were confined to specialized "alpine" habitats and seemed to offer no severe competition to associated species. Inverness Co.: small colony on dry exposed cliff-shelfs, Big Southwest Brook, Victoria Co.: rare colonies on exposed cliff of look-off near bog above Gray Glen Brook; abundant colonies on exposed headland, White Point (Smith and Schofield, 1952); Cumberland Co.: cliff ledges, Jeffers Brook; ledges, Isle au Haute. The N.S. plants have been examined cytologically and have a chromosome number  $2n = 54$ .

This is a hexaploid species from Calif. to Alaska and eastward across northern Can.

3. *A. lanulosa* Nutt. Fig. 137, b. YARROW

The common plant of eastern Amer. has been found to be tetraploid ( $2n=36$ ) in nature and thus different from the European hexaploid plant. Common throughout along roadsides, in fields; often troublesome on the dykelands and common in native habitats on headlands and in a variety of situations. July 15-Sept.

Nfld. to Alaska south to Penn. and Calif.

4. *A. Millefolium* L. See Mulligan and Bassett (1959).

*A. Millefolium* was found to be hexaploid and not the common weedy plant of eastern Canada. The 3 species treated here were further found to intergrade so much in their variable characteristics that it was impossible adequately to tell them apart without cytological investigation. The plants with pinkish to red flowers are considered to be a color form of this species from Europe, *forma rosea* Rand & Redfield.



Fig. 137.—Megalodonta: (a) *M. Beckii*  $\times \frac{1}{2}$ . — Achillea: (b) *A. Millefolium*  $\times \frac{1}{2}$ . — Anthemis: (c) *A. Cotula*  $\times \frac{1}{2}$ . — Matricaria: (d) *M. matricarioides*  $\times \frac{1}{2}$ . — Tanacetum: (e) *T. vulgare*, inflorescence  $\times \frac{1}{2}$ .