Rosaceae (Rose Family) Traits & Keys

The Comparison Charts for the Rosaceae are in a separate, downloadable pdf file.

Rosaceae Traits

The Rose Family is characterized by a number of traits, but there are also exceptions that make generalization difficult. The most consistent characteristic of the family is the presence of a **hypanthium**, a saucer- or cup-shaped extension of the receptacle (flower base) to which the perianth parts (sepals and petals) and stamens are attached. Pistils vary in number from 1 to many and are attached to the receptacle. Other traits of the Rosaceae include:

- Plants may be trees, shrubs, dwarf shrubs, or herbaceous (non-woody).
- Stems may be unarmed or armed with bristles, prickles, or thorns.
- Leaves may be basal and/or cauline and alternate; leaf blades may be simple, compound with 3 leaflets (trifoliolate), pinnately compound, or palmately compound.
- Stipules are usually present and fused to the base of the petiole.
- Flowers all have regular (actinomorphic) symmetry.
- Flowers may be terminal or axillary; and solitary or few to several in inflorescences: spikes, racemes, simple or compound cymes, cymules, panicles, or anthelae.
- Calyx lobes are 4–5, the base of the calyx is fused to the hypanthium.
- The receptacle may be flat or enlarged in fruit, forming a spongy, dome-shaped torus (*Comarum*) or a conical to elongate torus (*Rubus*).
- Epicalyx bractlets, a set of small bracts beneath the calyx, are often present; these bractlets are attached to the lower surface of the hypanthium, and alternate with the calyx lobes.
- Petals or 4–12 (usually 4-5) and distinct, or absent (*Alchemilla* and *Sanguisorba*).
- A nectar disc may be present at the top of the hypanthium.
- Stamens range from 4 (*Alchemilla*) to 100+ (*Rosa*).
- Each flower has 1 to many (250+) pistils; the pistils may be simple, with 1 carpel, or compound, with 2–5 carpels fused together; styles are often equal in number to the carpels.
- Fruit may be **simple** - drupes (*Prunus*) or achenes (*Alchemilla*); **aggregates** of achenes (*Potentilla*), drupelets (*Rubus*), or follicles (*Spiraea*), or **accessory** – hips (*Rosa*), pomes (*Malus*), or pseudocarps, aka strawberry (*Fragaria*).

Key to Rosaceae (Rose Family) species in Newfoundland and Labrador

1a. Plants woody, either shrubs or trees. **2**
1b. Plants herbaceous, or dwarf shrubs with prostrate, woody rhizomes that give rise to annual herbaceous shoots. **34**

2a. Shrub or trees with unarmed stems and branches. **3**
2b. Shrubs or trees with armed stems or branches. **19**

3a. Shrubs or trees with pinnately compound leaves. **4**
3b. Shrubs or trees with simple leaves, either unlobed or lobed. **8**

4a. Low shrubs; pinnately compound leaves have 5 leaflets; flowers solitary, petals are 5 and yellow; plants of rich fens and basic soils (limestone or serpentine). ..... ***Dasiphora fruticosa*** (shrubby cinquefoil)
4b. Tall shrubs or trees; pinnately compound leaves have 3–17 leaflets; flowers are numerous in domed or flat-topped, branched inflorescences; petals are white; native plants of forested habitats or naturalized near communities. **5**

5a. Leaves pinnately compound at the base, with 1–5 pairs of lanceolate leaflets and a pinnately lobed terminal leaflet, irregularly divided at the apex; flowers are arranged in dense inflorescences, 3–4 cm across; anthers are pink to red; fruits are reddish-purple to dark purple pomes, about 8 mm wide. ..... ×***Sorbaronia jackii*** (Jack's mountain ash)
5b. Leaves pinnately compound, with 11–19 leaflets; flowers are numerous, in large, domed compound cymes, 5–18 cm across; anthers are white; fruits are small, orange to red pomes, about 4–11 mm wide (*Sorbus*). **6**

6a. Leaves usually have 13–15 leaflets, but may range from 11–17; leaflets are oblong to lanceolate and 3.4–5 times longer than wide, leaflets taper gradually to an acuminate apex, margins are serrate; individual flowers are 5–7.5 mm across; pomes are orange-red to red and 4–7 mm wide. ..... ***Sorbus americana*** (American mountain ash)
6b. Leaves usually have 11–17 leaflets; leaflets are oblong to oblanceolate and 2.4–3.7 times as longer as wide; leaflets taper rather abruptly to an acute or obtuse apex, margins may be single- or double-serrate; individual flowers are 8–12 mm across; pomes are yellow, red-orange, to red, and 7–11 mm wide. **7**

7a. Terminal buds are shiny, 1–2 cm long, and glutinous; bud scale margins are pubescent, usually with reddish-brown hairs; lower leaflet surfaces are ± glabrous; leaflets are 13–17, oblong, with acute apices and serrate to double-serrate margins; flowers are 8–12 mm across; pomes are red. ..... ***Sorbus decora*** (showy mountain ash)

7b. Terminal buds are dull, 0.5–1.5 cm long, not glutinous, but usually very hairy, mainly with villous white hairs; lower leaflet surfaces are densely pubescent (tomentose to villous), usually with white hairs; leaflets are 11–17, oblong to oblanceolate, with acute to obtuse apices and serrate margins; flowers are 8–11 mm across; pomes are yellow, red-orange, to red; introduced plants of urban areas, occasionally dispersed by birds. .... ***Sorbus aucuparia*** (European mountain ash)

8a. Mid-size shrubs, 1–2 m tall; leaves are elliptic to obovate, 2–8 cm long × 1–3 cm wide, with rounded, obtuse, or acute apices and often double-serrate margins; individual flowers are 3–5 mm across, with white to pale pink petals; inflorescences are many-flowered, pyramid-shaped panicles; inflorescence branches and pedicels are glabrous; stamens are 30–35, with pale pink to white filaments; a ring of orange nectaries is present between the stamens and the 3–5 pistils; ovaries are superior; the fruit is an aggregate of glabrous, oblanceoloid follicles, 3–4 mm long. .... ***Spiraea alba*** var. ***latifolia*** (broadleaf meadowsweet)

8b. Low to tall shrubs or trees; flowers solitary or few to many in racemes or umbel-like clusters (fascicles); petals are white to pink-tinged; stamens are fewer than 30; pistils have 1–5 carpels, free or partially fused to the hypanthium; the fruit is a pome or drupe. **9**

9a. Tall shrubs to trees; broken twigs have an odour and taste of bitter almonds; leaves are lanceolate or obovate; flowers have 5 white petals, 15–20 stamens, and a single pistil with 1 carpel, free from the side the hypanthium; the fruit is a succulent red or black drupe with a large pit (*Prunus*). **10**

9b. Low shrubs to trees; broken twigs lack a bitter almond odour or taste; leaves are elliptic, lanceolate, ovate, or obovate; flowers have 5 white petals, often pink-tinged in bud, 7–28 stamens, and a single pistil with 5 carpels, in fruit becoming completely fused to the hypanthium; the fruit is a small to large pome. **11**

10a. Leaves are lanceolate, about 4.5–10 cm long × 1.5–5 cm wide, tapering gradually to an acuminate apex; twigs bear several, small, umbel-like fascicles of about 2–8 flowers; drupes are spherical, translucent red, 6–10 mm wide, and borne on erect to divergent peduncles. ..... ***Prunus pensylvanica*** (pin cherry)

10b. Leaves are ovate to obovate, usually 2.5–9 cm long × 1.2–5 cm wide, tapering abruptly to a short-acuminate apex; flowers are 18–50+, in racemes 4–11 cm long; the numerous, spherical to ovoid, opaque, red to dark purple drupes are 6–14 mm wide, and borne in pendant clusters. ..... ***Prunus virginiana*** (choke cherry)

11a. Trees, with small clusters of large flowers, each 3–4 cm across; leaves are elliptic to ovate, 5–10 cm long × 3–6.5 cm wide, margins coarsely serrate or crenate; stamens are 20; the fruit is a large pome (apple), 2–7 cm wide, with a cartilaginous core and crisp white or greenish-white flesh; skin colour may be green, yellow, or red, depending on the cultivar. ..... ***Malus pumila*** (common apple)

11b. Low shrubs to small trees; flowers are solitary and axillary, or in small panicles or racemes; leaves are elliptic to obovate or nearly orbicular, margins are finely serrate or crenate; stamens are 7–28; the fruit is a small red, purple, or black pome, to 1.5 cm wide, with succulent, yellowish (*Amelanchier*) or dark purple (*Aronia*) flesh. **12**

12a**.** Low shrubs, up to 3 m tall, usually less than 2 m tall in our area; leaves are elliptic, oblanceolate, or obovate; blades are dark green and often lustrous above, with finely crenate margins and small, but thick, dark red, stipitate-glandular hairs along the upper surface of the midrib; leaf bases are cuneate, apices are obtuse to short-acuminate; leaves turn bronze to scarlet or deep red in autumn; flowers are usually 5–20 in small panicles, petals are white to pink-tinged in bud; stamens have light to dark red anthers; pomes are purple or black, 6–10 mm wide, sparsely pubescent, with calyx lobes that curve inward, over the top of the fruit (*Aronia*)..... **13**

12a**.** Low shrubs to trees, 0.3–10+ m tall; leaves are elliptic, oval, oblong, ovate, obovate, or nearly orbicular; blades are often reddish when young, becoming green with maturity, surfaces are dull, margins are serrate; leaves lack stipitate-glandular hairs along the midrib; leaf bases are cuneate to rounded or slightly cordate, apices are rounded, obtuse, acute, or acuminate; leaves turn bronze, red, or yellow in autumn; flowers are solitary to few, or in racemes of 3–17 flowers; petals are white; stamens have white to pale yellow anthers; pomes are red, purple, blue, or black, 6–15 mm wide, with erect to spreading calyx lobes, exposing the glabrous or pubescent top of the ovary (*Amelanchier*). **14**

13a. Young stems and inflorescence branches are densely white-pubescent (tomentose); lower leaf surfaces and calyx lobes are densely tomentose to glabrate and may bear short, stipitate-glandular hairs along their margins; pomes are reddish-purple to dark purple at maturity. ..... ***Aronia ×prunifolia*** (purple chokeberry)

13b. Stems, inflorescence branches, and lower leaf surfaces are glabrous or only sparsely pubescent (tomentose), calyx lobes are glabrous and lack marginal stipitate-glandular hairs; pomes are deep purple to black at maturity. .... ***Aronia melanocarpa*** (black chokeberry)

14a**.** Medium to low shrubs, 0.3–2.5 m tall, stems are rhizomatous, plants often forming dense colonies; leaf blades are elliptic, oblong to orbicular, with cuneate, rounded, to subcordate bases and acute to rounded, often mucronate apices. **15**

14a**.** Tall shrubs or trees, 1–25 m tall, stems not rhizomatous; leaf blades are elliptic, ovate, to obovate, with rounded to subcordate bases and acute to acuminate apices. **17**

15a. Mature leaves are elliptic, petioles are less than 1 cm long; leaf bases are usually cuneate to obtuse; flowers are 1–4, terminal or axillary; petals are obovate to orbicular; pomes are oblong to obovoid, 7–8.7 mm long. .. ***Amelanchier bartramiana*** (Bartram's chuckleypear)

15b. Mature leaves are oblong to orbicular, petioles are 1–2.5 cm long; leaf bases are rounded to subcordate; inflorescences are raceme of 3–9 flowers; petals are oblanceolate or oblong, 6.5–15 mm long. **16**

16a**.** Shrubs usually on calcareous substrates; leaves are sparsely hairy to glabrous at flowering; blades are elliptic-oblong to obovate and 5–8 cm long × 1.5–4.5 cm wide; racemes have 3–8 flowers, the lowest pedicel is 1.5–3.5 cm long; petals are 8–15 mm long, calyx lobes are 3–5 mm long, spreading or ascending in fruit, with a glabrous upper surfaces; the exposed top of the ovary is densely pubescent to sparsely so in fruit. ..... ***Amelanchier fernaldii*** (Fernald's chuckleypear)

16a**.** Shrubs usually on acidic substrates; leaves are densely hairy at flowering; blades are oblong to orbicular, 3–4.5 cm long × 2–3.3 cm wide; racemes have 6–9 flowers; the lowest pedicel is 0.7–1.6 cm long; calyx lobes are 2.3–3 mm long, reflexed in fruit, with a tomentose upper surface; petals are 6.5–9 mm long; the exposed top of the ovary is densely pubescent. ..... ***Amelanchier spicata*** (running chuckleypear)

17a. Calyx lobes are tomentose above; tops of the ovaries are densely pubescent; leaves have 7–12 pairs of secondary veins and 4–5 teeth in the upper centimetre of the blade; pomes are 6–8 mm wide. ..... ***Amelanchier interior*** (inland chuckleypear)

17b. Calyx lobes are glabrous or glabrate above; tops of the ovaries are sparsely pubescent to glabrous, leaves have 7–17 pairs of secondary veins and 5–19 teeth in the upper centimetre of the blade; pomes are 7–15 mm wide. **18**

18a. Leaves are sparsely pubescent at flowering, with 7–11 pairs of secondary veins and 13–19 teeth in the upper centimetre of the blade; leaves usually remaining purplish to bronze at maturity; flowering racemes are erect; plants of wet, often calcareous habitats; reports from Nfld. are uncertain. ..... ***Amelanchier intermedia*** (purple chuckleypear)

18b. Leaves are usually glabrous (to sparsely pubescent) at flowering, with 12–17 pairs of secondary veins and 5–9 teeth in the upper centimetre of the blade; leaves are initially purplish to bronze, becoming dark green at maturity; flowering racemes are nodding; plants of dry to moist, usually acidic habitats. ..... ***Amelanchier laevis*** (smooth chuckleypear)

19a. Branches are armed with straight to slightly curved thorns, 2–8 cm long; leaves are simple; the 3–6 pairs of short, triangular lobes have irregular and sharply serrate margins; the fruit is a red pome (*Crataegus*). **20**

19b. Branches are armed with slender bristles or straight to strongly curved prickles; to 1.2 cm long; leaves are compound, with 3–11 leaflets; the fruit is an aggregate of drupes (*Rubus*) or an aggregate of achenes within a fleshy hip (*Rosa*). **21**

20a. Leaves are firm; blades are ovate, broadly elliptic, to nearly orbicular, with 3–5 shallow lobes in the upper 2/3 of the blade; leaf bases are usually cuneate to broadly obtuse; inflorescence branches are sparsely to densely pubescent (villous);

the hypanthium is densely pubescent (villous); stamens are 10, with white to pale yellow anthers. ..... ***Crataegus chrysocarpa*** (fireberry hawthorn)

20b. Leaves are thinner (membranaceous); blades are ovate or oval, with 4–6 lobes that extend nearly to the truncate to rounded base; inflorescence branches are glabrous; the hypanthium is glabrous; stamens are 5–10, with pink to red anthers. .... ***Crataegus macrosperma*** (bigfruit hawthorn)

21a. Stems (canes) are biennial, persisting for 2 years; first-year canes (primocanes) are vegetative; second-year canes (floricanes) are fertile; stems are armed with slender bristles or prickles, or broad-based, straight or curved prickles; leaves are pinnately or palmately compound, usually with 3–5 leaflets; the fruit is an aggregate of drupelets (*Rubus*, in part). **22**

21b. Stems are perennial, adding new growth annually; plants are armed with slender or broad-based, curved prickles; leaves are pinnately compound, with 5–11 leaflets; the fruit is a fleshy, orange or red rosehip surrounding an aggregate of achenes (*Rosa*). **26**

22a. Canes are erect, often reddish-purple, sometimes glaucous, and armed with numerous, slender bristles; prickles are absent; leaves of first-year canes (primocanes) are pinnately compound, usually with 5 leaflets, sometimes 3; leaves of fertile canes (floricanes) have 3 leaflets, seldom only a simple blade; terminal leaflets are lanceolate to ovate, with rounded to cordate bases and acuminate apices; lateral leaflets are similar in shape but smaller; lower leaflet surfaces are pubescent with light-grey hairs and stipitate-glandular hairs; flowers are nodding, about 1 cm wide, and solitary or few in axillary clusters; petals are 5, white, oblanceolate, and erect; stamens are numerous, erect, with laminar (flat) filaments; ovaries are 10–60 and finely pubescent; the fruit (a raspberry) is an aggregate of red drupelets, separating easily from the receptacle (torus) at maturity. .... ***Rubus idaeus*** var. ***strigosus*** (wild red raspberry)

22b. Canes are erect, arching, or trailing, not glaucous, and armed with bristles, slender prickles, 1–4 mm long, and/or broad-based curved prickles; primocane leaves are palmately compound, with 3 or 5 leaflets; floricanes leaves usually have 3 leaflets; lower leaflet surfaces are glabrous to sparsely pubescent; terminal leaflets are elliptic to nearly cordate, with cuneate to cordate bases and obtuse to long-attenuate apices, lateral leaflets are elliptic to obovate; flowers are 2–25, in erect racemes or corymbs; petals are 5, white, oblanceolate to obovate, and spreading; stamens are numerous, spreading, with filiform (thread-like) filaments; ovaries are 5–many and glabrous; the fruit (a blackberry) is an aggregate of reddish-purple to black drupelets, not separating from the receptacle (torus) at maturity. **23**

23a. Primocanes are trailing, to 2.5 m long, usually rooting at the stem tips; floricanes are erect, to 2 dm tall; canes are armed with numerous, slender, spreading to downward-curved (declined) prickles and bristles; petioles are very bristly; all leaves usually have 3 leaflets (rarely 5); terminal primocane leaflets are 2.5–7 cm long × 2–5.5 cm wide, obovate, rhombic, to nearly orbicular, with a short stalk (petiolule), bases are cuneate to

rounded, and apices are acute to obtuse; blades are glabrous on the upper surface, glabrous beneath, or often with bristles and/or short, stipitate-glandular hairs along the midvein and larger veins; floricane terminal leaflets are smaller than primocane terminal leaflets; flowers are solitary in leaf axils, or in racemes of 2–8 flowers, pedicels and calyx lobes are finely pubescent and sometimes armed with scattered bristles; petals are 5–10 mm long × 2–5 mm wide, oblanceolate to obovate; fruits are up to 1 cm long, with about 10–15 reddish-purple drupelets. ..... ***Rubus hispidus*** (hispid blackberry)

23b. Canes are erect to arching, to 3 m tall, not rooting at the tips; canes are armed with slender bristles or slender to broad-based prickles; primocane leaves usually have 5 leaflets, occasionally 3, with lower leaflets often partially lobed; floricane leaves usually have 3 leaflets; terminal primocane leaflets are larger, elliptic, ovate, rhombic, obovate, or nearly orbicular, with a long stalk (petiolule), usually >1 cm long; middle and lower lateral leaflets have shorter petiolules, the lowest pair is sometimes sessile; bases are cuneate to slightly cordate, apices are acute to long-attenuate; lower blade surfaces bear bristles or small prickles (pricklets) along the midrib; floricane leaves have smaller and narrower leaflets, with cuneate to rounded bases and acute to acuminate apices; inflorescences are racemes or corymbs with 5–25 flowers, pedicels and calyx lobes are ± pubescent and usually armed with scattered bristles or prickles; petals are 6–22 mm long × 2–12 mm wide, elliptic, oblanceolate, or obovate; fruits are 0.7–2 cm long, with about 5–100 black drupelets. **24**

24a. Canes are erect or arching, to 1.5 m tall, terete (round in cross-section); prickles are usually absent, but if present are 1–4 mm long; bristles are slender, numerous, and spreading or reflexed; petioles are ± bristly; terminal primocane leaflets are 4.5–11.5 cm long × 2–7 cm wide, bases are cuneate to narrowly obtuse, apices are acute, abruptly acuminate, or attenuate; lateral leaflets are elliptic to obovate, sessile or with short petiolules, bases are cuneate to narrowly obtuse, apices are obtuse to abruptly acuminate; blades are ± glabrous on both surfaces; inflorescences have 5–15 flowers, pedicels and calyx lobes are pubescent and usually armed with bristles or prickles; petals are 6–13 mm long × 2–4 mm wide, oblanceolate to obovate; fruits are 0.7–1.5 cm long, somewhat dry, globose, with about 5–25 drupelets. ..... ***Rubus setosus*** (bristly blackberry)

24b. Canes are arching, to 3 m tall, green to reddish-purple, often 5-angled with rounded edges, and armed with slender or broad-based prickles, bristles are usually absent; petioles are usually prickly; terminal primocane leaflets are 3–15 cm long × up to 13 cm wide; bases are rounded to cordate, apices are abruptly acuminate to long attenuate; lateral leaflets are progressively smaller, with shorter petiolules, the lowest leaflets are nearly sessile; blades are glabrous above, glabrous or pubescent beneath; inflorescences have 5–25 flowers, pedicels are finely pubescent and often armed with small downward-curved (declined), prickles, calyx lobes are unarmed; petals are 8–22 mm long × 5–12 mm wide, ovate or obovate; fruits are about 1–2 cm long, usually edible and juicy, globose to ellipsoid, with 10–100 drupelets. **25**

25a. Canes are glabrous, usually armed with a few, scattered, straight or downward-curved (declined), broad-based prickles, <1–5 mm long; blades are glabrous on both surfaces, but paler beneath; terminal primocane leaflets are 3–11 cm long × 3–5 cm wide, elliptic to ovate, and shiny; bases are rounded to noticeably cordate; apices are long-attenuate; middle and lower leaflets are elliptic, lanceolate, or obovate, with cuneate, to narrowly cordate bases and acute to acuminate apices; inflorescences have up to 25 flowers; petals are elliptic to ovate. **Note:** *Rubus* ×*crux* (previously known as *Rubus elegantulus* or *Rubus pergratus*), is a hybrid of *Rubus canadensis* and *Rubus pensilvanicus,* and may key out here to either of the species in couplet 25, as it exhibits traits intermediate between the two parents. ..... ***Rubus canadensis*** (smooth blackberry)

25b. Canes are glabrous or finely pubescent, armed with broad-based, spreading to downward-curved (declined) prickles, 4–10 mm long; blades are finely- to velvety-pubescent on the lower surface, especially when young; terminal primocane leaflets are 5–15 cm long × 3–13 cm wide, lanceolate to broadly ovate, and not particularly shiny; bases are rounded to slightly cordate, apices are abruptly acuminate to long-attenuate; middle and lower leaflets are elliptic to obovate, with cuneate, obtuse, or rounded bases and short-acuminate apices; inflorescences have up to 16 flowers; petals are obovate. .... ***Rubus pensilvanicus*** (Pennsylvania blackberry)

26a. Flowers are 1.5–2.5 cm across, fragrant, and in panicles of 5–40+ flowers; petals are white and obcordate; stipules are 8–13 mm long × 1.5–2 mm wide, with fringed (fimbriate) margins; prickles are infrastipular (situated just below the nodes), paired, curved, 4–6 mm long, and broad-based; internodal prickles (situated on the internodes) are similar, but few or absent, aciculi are (needle-like bristles) absent; styles extend 3–4 mm beyond the opening to the hypanthium (stylar orifice); hips are 5–7 mm across, ovoid to globose, and red-orange or red. .... ***Rosa multiflora*** **(Japanese rose)**

26b. Flowers are 2–9 cm across, fragrant or not, solitary, or with 2–5 (rarely more) flowers in corymbs or panicles; petals are pink or white and obovate or obcordate; stipules are 6–30 mm long × 1.5–9 mm wide, with entire, serrate, or stipitate-glandular margins; prickles are infrastipular and/or internodal, with or without aciculi; styles extend 0.5–2.5 mm beyond the stylar orifice (to 4 mm beyond in *Rosa cinnamomea*); hips are 6–25 mm across, of various shapes and colours. **27**

27a. Flowers are large, 6–9 cm across, with single or double-petalled flowers; petals are deep pink or white; young stems are densely short-pubescent and very prickly, with 2–3 large, ± straight infrastipular prickles, 10 mm long × up to 4 mm wide, and pubescent at the base; numerous smaller internodal prickles and aciculi are also present; leaves have 5–9 leaflets, blades are rugose, dark green, and glabrous above, densely grey-pubescent beneath; hips are large, depressed-globose (wider than long), 1.8–2 cm long × 2–2.5 cm wide, yellow, orange, or red; glabrous, or with slender bristles ± below the middle; calyx lobes extend forward (porrect). ..... ***Rosa rugosa*** (rugosa rose)

27b. Flowers are smaller, 2–5.5 cm across, with single or double-petalled flowers; petals are of various shades of pink or red, or petals white; stems have infrastipular and/or internodal prickles, bases of prickles are glabrous; aciculi are present or absent; leaves have 5–9 leaflets, blades are membranaceous, not rugose, and glabrous or pubescent beneath; hips are globose, ovoid, or urceolate (urn-shaped), 0.6–2.5 cm long × 0.5–2.2 cm wide, red-orange or bright to dark red, glabrous or stipitate-glandular; calyx lobes may extend forward (porrect), or are spreading to reflexed, or deciduous in fruit. **28**

28a. The hypanthium and hips are densely stipitate glandular; petals are pink, rarely white; hips are 8–12 mm long, ± globose, and red-orange, red, or dark red; native species of insular Newfoundland. **29**

28b. The hypanthium and hips are glabrous, rarely with a few slender bristles near the base; petals are pink or white; hips are 6–25 mm long, and of various shapes and shades of red to brown; all introduced species, escaped from cultivation. **30**

29a. Stems are armed with infrastipular prickles, as well as numerous reddish internodal prickles and aciculi; infrastipular prickles are up to 6 mm long, paired, slender, straight or bent downward, but not curved; internodal prickles are dense, slender, straight, and 2–7 mm long; leaves usually have 7–9 leaflets, sometimes 5 on early leaves, the stalk (petiolule) of the terminal leaflet is 3–5 mm long; stipules are 1–1.4 cm long × 4–5.5 mm wide; hips are 7–10 mm wide. ..... ***Rosa nitida*** (shining rose)

29b. Stems are armed with 1 or 2 Infrastipular prickles, 6–10 mm long, and straight to curved; internodal prickles and aciculi are seldom present; leaves usually have 5–7 leaflets, the stalk (petiolule) on the terminal leaflet is 6–14 mm long; stipules are larger, 1.4–2.5 cm long × 4–9 mm wide; hips are 9–13 mm wide. ..... ***Rosa virginiana*** (Virginia rose)

30a. Flowers are about 3–5 cm across, fragrant, double-flowered, with numerous, light pink to mauve-pink petals; stems are armed with paired infrastipular prickles, 4–7 mm long, and straight or curved; the fruits rarely reach maturity; double-flowered forms are likely cultivar '*Foecundissima*' (double cinnamon rose). .... ***Rosa cinnamomea*** (cinnamon rose)

30b. Flowers are 2–5 cm across, fragrant or not, single-flowered, with 5 petals, either solid pink, pink with a white base, or all white; stems are with or without infrastipular and internodal prickles, aciculi are rare; hips are 0.6–2.5 cm long. ... **31**

31a. Leaves are bluish-green to purplish, younger stems and leaves are glaucous; infrastipular and internodal prickles are few to none; older stems are armed with numerous, narrow, broad-based, downward-curved (declined) prickles, 2–5 mm long; petals are deep pink and white at the base, obovate, and 0.8–1.4 cm long × 5–6 mm wide; calyx lobes are 1.5–2.5 cm long (longer than the petals), with a caudate tip 1–1.5 cm long; hips are ovoid, 1–1.3 cm long × 0.8–1.1 cm wide, and deep red to purplish-brown. .... ***Rosa glauca*** (redleaf rose)

31b. Leaves are green and glabrous, but not glaucous; stems are armed with 1 or a pair of infrastipular, narrow, broad-based, straight or downward-curved (declined) prickles, 6–12 mm long; internodal prickles and aciculi may be present or absent; petals are white, solid pink, or pink, fading to white at the base, obcordate, and 1.1–2.5 cm long × 1.1–2 cm wide; calyx lobes are 0.8–1.7 cm long (equal to or shorter than the petals), with tapering or caudate tips; hips are ovoid, ellipsoid, or urceolate (urn-shaped), 0.6–2.5 cm long × 0.5–2.2 cm wide, and red-orange, red, purplish-red, or dark red. **32**

32a. Infrastipular prickles are straight, usually paired, and 2–8 mm long × 1–5 mm wide; internodal prickles and aciculi are often present on younger branches; the lower surface of the velvety-pubescent petioles and rachis often bear a few small prickles (pricklets); stipule margins are entire to undulate; pedicels are glabrous and 1–2 cm long; calyx lobes are 8–15 mm long × 1.5–2.5 mm wide, with tapering tips 4–6 mm long, ascending or extend forward, the lobes are glabrous on the lower surface, with entire margins, and are persistent in fruit; petals are 1.5–2.0 cm long and wide; hips are 0.6–1.3 cm long × 0.5–1.2 cm wide, glabrous, and red-orange, red, or purplish-red. This species is known in insular Nfld. from a single collection in St. Anthony (Lewis and Elvin-Lewis 2017), which likely represents a persistent planting of this western Canadian species. ..... ***Rosa woodsii*** subsp***. woodsii*** (Woods's rose)

32b. Infrastipular prickles are downward-curved (declined), single or paired, and 6–12 mm long × 3–9 mm wide; internodal prickles are present, aciculi are present or absent; pricklets are often present on the lower surface of the petioles and rachis; stipule margins are often densely stipitate-glandular; pedicels are glabrous or stipitate-glandular; calyx lobes are 10–18 mm long × 2–5 mm wide, tapering to somewhat wider (caudate) tips 4–6 mm long, spreading or extending forward, margins are ± pinnatifid (with 1–few lobes on each side), glabrous or stipitate glandular beneath, and deciduous on mature fruit; petals are about 1.5–2.5 cm long × 1–1.8 cm wide; hips are 1–2.5 cm long × 0.6–2.2 cm wide, glabrous to rarely bristly at the base, and of various shades of red to brown. **33**

33a. Infrastipular prickles are usually paired, 6–7 mm long × 4–9 mm wide, and of similar lengths; internodal prickles are often one, straight or declined (in our area, often with 2 or more internodal prickles crowded just below the infrastipular prickles); aciculi are absent; stipule margins are usually stipitate-glandular; leaves are 6–11 cm long, and without fragrance; terminal leaflets are elliptic, ovate, or obovate, and 1.5–4 cm long × 1.2–2 cm wide; the petioles, rachis, leaflet blades, and pedicels are glabrous; pedicels are 8–20 mm long, usually without stipitate-glands; petals are 1.8–2.5 cm long × 1.5–1.8 cm wide; hips are 1–2.4 cm long × 0.6–1.6 cm wide, glabrous, red, and globose, ovoid, or urceolate. .... ***Rosa canina*** (dog rose)

33b. Infrastipular prickles are single or paired, 6–12 mm long × 3–7 mm wide, and of unequal lengths; internodal prickles and aciculi are present on younger branches; stipule margins are densely stipitate-glandular; leaves are 4–6.5 cm long; terminal leaflets are broadly oval to nearly orbicular, and 1–2.5 cm long × 0.8–1.5 cm wide; lower blade surfaces are finely pubescent, densely stipitate-glandular, and somewhat sticky (viscid), with an apple-

like fragrance; the petioles, rachis, pedicels, and the lower surface of the calyx lobes are densely stipitate-glandular; pedicels are 6–9 mm long and densely stipitate-glandular; petals are 1.1–2 cm long × 1.1–1.8 cm wide; hips are 1–2.5 cm long × 1–2.2 cm wide, glabrous to sometimes bristly at the base, dark red, to reddish-brown, and, ovoid, ellipsoid, or obovoid. ..... ***Rosa rubiginosa*** (sweetbriar rose)

34a. Herbaceous plants with compound leaves, stems erect or sometimes trailing and stoloniferous; or dwarf shrubs with unarmed, horizontal, woody stems and annual herbaceous shoots with compound leaves. **35**

34b. Herbaceous plants with simple leaves, blades are palmately lobed, broadly cordate, reniform, to nearly orbicular; or creeping dwarf shrubs with simple lanceolate leaves and entire or crenate margins. **65**

35a. Dwarf shrubs with slender, above-ground, trailing, woody stems (primocanes), rooting at the tip; erect, leafy, annual flowering shoots (floricanes) grow from the nodes; leaves are compound, occasionally with 5 leaflets, but usually with 3, the 2 lateral leaflets then often shallowly 2-lobed or nearly divided to the petiole; pedicels and outer surfaces of the calyx lobes are stipitate glandular; flowers lack epicalyx bractlets below the calyx; the 5–8 petals are white to pink, erect, and clawed; stamens are numerous, with erect, flat (laminar) filaments; the 0.5–1.4 cm wide fruit is an aggregate of 10–25 deep red drupelets, not separating easily from the torus. **36**

35b. Herbaceous plants, sometimes with slightly woody older stems or stem bases; stems not trailing nor rooting at the tip; leaves are compound, with 3–31 leaflets; flowers with or without epicalyx bractlets below the calyx; petals are white, yellow, or pink to magenta; stamens are numerous, usually with filiform (thread-like) filaments; fruits are variable; either a single achene (*Alchemilla*), an aggregate of achenes (*Potentilla* and *Sibbaldia*), an aggregate of drupelets on an elongate torus (*Rubus*), or an accessory fruit with an enlarged, fleshy torus bearing numerous small achenes on the surface (*Fragaria*). **37**

36a. Leaves are light to medium green, sometimes bronze or reddish-tinged when growing in sunny locations; terminal leaflets are rhombic to obovate, 4–8 cm long × 2–4 cm wide, with a cuneate base, and acute to acuminate apices; lateral leaflets are similar; calyx lobes are 3–7 mm long, narrowly triangular, sparsely pubescent, and strongly reflexed at flowering; petals are 6–8 mm long, white to pale pink, and obovate to oblanceolate. ..... ***Rubus pubescens*** (dewberry)

36b. Leaves are usually green and intermediate in traits between the two parents (*Rubus pubescens* and *Rubus arcticus* subsp. *acaulis*); terminal leaflets are obovate with a cuneate base and more rounded apices; calyx lobes are usually 5–8 mm long and similar to those either parent; petals are 8–12 mm long, pink to magenta, and ovate to obovate, and ascending to spreading, with blunt to rounded apices. ..... ***Rubus* ×*paracaulis*** (hybrid plumboy)

37a. Flowers lacking an epicalyx; leaflets 3; plants low, to 1 or 2 dm tall; leaves are dark green, rugose, firm, ± shiny, with an ovate to obovate central leaflet, to 3.5 cm long (rarely to 6 cm long), apices are obtuse to rounded; lateral leaflets are similar but slightly smaller, with broadly obtuse to rounded bases; flowers are solitary; the calyx lobes are 7–12 mm long, white-tomentose on the inner surface, and spreading to loosely reflexed in flower; the 5–8 petals are 15–25 mm long, pink to magenta, and oblanceolate to obovate; the fruit is a globose, dark red to purple aggregate of 15–30 drupelets, to 1 cm across. .... ***Rubus arcticus*** subsp. **acaulis** (plumboy)

37b. Flowers with an epicalyx, the epicalyx bractlets are equal in number to and alternate with the calyx lobes; leaves are compound, with 3–31 leaflets; plants are low, erect, or prostrate; flowers have 4–5 white or yellow petals, or petals are lacking. **38**

38a. Leaves with 3 leaflets, or leaves palmately compound, with 5–9 leaflets. **39**

38b. Leaves pinnately compound, with 5–31 leaflets. **54**

39a. Leaves basal, with 3 leaflets (trifoliolate), the terminal leaflet is obovate, lateral leaflets are ovate to obovate; plants have slender, trailing stolons, rooting at the nodes; the fruit is an accessory and aggregate fruit (strawberry), consisting of an enlarged red, ovoid receptacle (torus) bearing on the surface an aggregate of numerous, small achenes. **40**

39b. Leaves basal and/or cauline, with 3–9 leaflets of various shapes; plants are erect, form tufts or mats, or are trailing; the fruit is an achene or an aggregate of achenes. **42**

40a. The terminal tooth of the central leaflet is longer than the adjacent teeth; peduncles are longer than the petioles, flowers are usually borne well above the leaves; fruits have achenes situated in very shallow pits on the surface of the fleshy torus. ..... ***Fragaria vesca*** (woodland strawberry)

40b. The terminal tooth of the central leaflet is shorter than the adjacent teeth; peduncles are about equal in length or shorter than the petioles, flowers are usually borne at about the same height or below the leaves; fruits have achenes recessed in deep pits on the surface of the fleshy torus. **41**

41a. Hairs on petioles, peduncles, and pedicels are appressed or ascending, sometimes sparse; leaves are glaucous. ..... ***Fragaria virginiana*** subsp. ***glauca*** (northern wild strawberry)

41b. Hairs on petioles, peduncles, and pedicels are usually spreading, at least towards the base; leaves not glaucous. ..... ***Fragaria virginiana*** subsp. ***virginiana*** (wild strawberry)

42a. Flowers are small and numerous in many-branched inflorescences (compound cymes); petals are lacking; the petaloid calyx is 4-lobed; flowers are 2–4 mm across; epicalyx bractlets are half as long as the calyx lobes; stamens are 4; carpels 1; leaves have 5–7, narrowly elliptic to oblanceolate leaflets, the upper surface is glabrous and shiny, the lower surface is densely pubescent with appressed, silky white hairs (sericeous); margins are entire and edged with silky, white hairs; each leaflet is tipped with 7–11 small teeth; the fruit is a small achene, surrounded by the persistent hypanthium. ..... ***Alchemilla alpina*** (alpine lady's mantle)

42b. Flowers are solitary or in few- to many-flowered inflorescences (cymes); petals are white or yellow, 4–5; the calyx is 4–5-lobed and green, flowers are 4–30 mm across; epicalyx bractlets are present; stamens are 4–20+; carpels are 5–200+; the fruit is an aggregate of achenes (achenetum), loosely surrounded by the persistent calyx and epicalyx. **43**

43a. Leaves have 3 cuneate, oblanceolate, or obovate leaflets; margins are entire for most of their length, but terminate in 3, rarely 5, shallow teeth; petals are yellow or white; plants spread by slightly woody rhizomes (*Sibbaldia*). **44**

43b. Leaves have 3–7 oblanceolate to obovate leaflets, margins are coarsely toothed, often nearly to the base, with 5–17+ teeth (2–8 or more on each side, plus a terminal tooth); petals are yellow (*Potentilla, in part*). **45**

44a. Plants are low and tufted, with flowering/fruiting stems to 3 dm tall; leaves are mostly basal, coriaceous, and evergreen; leaflets are narrowly elliptic to oblanceolate and 1–3 cm long, the upper surface is dark green and lustrous; the open cyme has 2–10 flowers, each with 5 calyx lobes, 2–3 mm long, 5 epicalyx bractlets, and 5 white or occasionally pink-tinged petals, ovate to obovate, and 5–8 mm long; stamens are 20, with filaments to 3.5 mm long and reddish anthers; the fruit is an aggregate of 10–30 achenes; plants mainly of acidic, rocky, coastal and alpine barrens, dry open woods, sandy soils, and bog hummocks, also found in serpentine and limestone barrens. ..... ***Sibbaldia tridentata*** (threetooth cinquefoil)

44b. Plants forming low mats, with flowering/fruiting stems to 1.5 dm tall; leaves are basal, membranaceous, and deciduous; leaflets are elliptic, oblanceolate, or occasionally obovate, 0.7–1 cm long, with a dull, upper blade surface; cymes are dense and capitate, with 3–12 flowers, each with 5 calyx lobes, 5 epicalyx bractlets, 5 petals, and 5 short stamens with yellow anthers; petals are yellow, oblanceolate, 1–2 mm long, and shorter than the 1.2–5 mm long calyx lobes; the fruit is an aggregate of 5–15 achenes; alpine plants, usually found in snowbeds and exposed alpine slopes. ..... ***Sibbaldia procumbens*** (creeping sibbaldia)

45a. Plants have long, trailing stems and root at the nodes; leaves are palmately compound, with 3–7 leaflets; flowers are solitary and axillary; introduced species. **46**

45b. Plants are tufted, forming small clumps, or plants erect, never stoloniferous nor rooting at the nodes; leaves are palmately compound, with 3–9 leaflets; flowers are solitary or few to many in terminal cymes. **47**

46a. Leaves usually have 3 leaflets, occasionally 4 or 5; leaflets are oblanceolate or obovate, the central leaflet is 1–3 cm long; leaflet margins are coarsely serrate with 5–9 teeth (2–4 on each side + 1 terminal tooth); flowers are borne on peduncles 3–10+ cm long, and usually have 4 calyx lobes and 4 petals (occasionally 5). .... ***Potentilla anglica*** (English cinquefoil)

46b. Leaves usually have 5 leaflets, occasionally 7, leaflets are usually elliptic to oblanceolate; the central leaflet is 1.5–6 cm long; leaflet margins are sharply serrate with 9–17 or more teeth (4–8+ on each side + 1 terminal tooth); flowers are borne on peduncles 1–5 cm long, with 5 calyx lobes and 5 petals. .... ***Potentilla simplex*** (oldfield cinquefoil)

47a. Basal leaves with 3 leaflets; or cauline leaves with 3 leaflets, sometimes with pinnately compound basal leaves that wither as the erect flowering stem develops. **48**

47b. Basal leaves with 5–7 leaflets. **50**

48a. Annual or biennial plants with erect stems, 2–5+ dm tall; stems and petioles have stiff, straight (hirsute), spreading to ascending hairs, to 2.5 mm long; basal leaves have 3–9 leaflets, soon withering and turning brown; cauline leaves have 3 elliptic, oblanceolate, or obovate leaflets, 1–6 cm long × up to 4 cm wide; margins have 9–17+ teeth (4–8+ on each side + 1 terminal tooth); lower leaves have long petioles, upper leaves are progressively smaller and sessile or have shorter petioles; flowers are 5–40+ in a ± compact, leafy cyme; petals are 5, obovate, 3–5 mm long, and yellow, their edges not overlapping and shorter than the calyx lobes; stamens are 15–20; achenes are numerous (60–150) and rugose (wrinkled) on the surface. .... ***Potentilla norvegica*** (rough cinquefoil)

48b. Perennial plants; leaves are mainly basal, with 3 elliptic to obovate leaflets, to 3 cm long × up to 2 cm wide; margins have 5–11 teeth (2–5 on each side + 1 terminal tooth); flowers are solitary or in 3–5-flowered open cymes on long peduncles; petals are 5, obcordate, 4–9 mm long, and yellow, often deeper yellow at the base, their edges often overlapping and about equal to longer than the calyx lobes; stamens are about 20; achenes are 20–80 and smooth on the surface. **49**

49a. Arctic-alpine plants of northern Labrador, mainly on acidic substrates; flowering stems to 2 dm tall; leaves are basal; petioles are 1–6.5 cm long; the central leaflet is broadly elliptic to obovate, to 2.5 cm long × up to 2 cm wide, usually on a short petiolule 2–3 mm long; lateral leaflets are sessile; leaflet margins have 5–11 teeth (2–5 on each side + 1 terminal tooth), the teeth end in obvious tufts of white villous hairs; upper leaflet surfaces are dark green, lower surfaces are paler; both surfaces are sparsely pubescent; flowers are 1.5–2 cm across, peduncles have long, shaggy (villous) hairs; petals are longer than the calyx lobes; achenes are 50–80. ..... ***Potentilla hyparctica*** subsp. ***elatior*** (tall arctic cinquefoil)

49b. Arctic-alpine plants of w/nwNfld. and Labrador, mainly on limestone substrates; flowering stems to 3 dm tall, sometimes with one reduced cauline leaf; leaves are usually all basal, petioles are 1–6 cm long; the central leaflet is obovate, to 3 cm long × up to 1.2 cm wide and nearly sessile; lateral leaflets are similar but shorter; leaflet margins have 7–11 teeth (3–5 on each side + 1 terminal tooth), the teeth end in a few short, inconspicuous hairs; upper leaflet surfaces are dark green and nearly glabrous, lower surfaces are densely white-tomentose; flowers are 1–2 cm across, peduncles are somewhat tomentose, especially near the flowers; petals are barely longer than the calyx lobes; achenes are 20–40. ..... ***Potentilla nivea*** (snowy cinquefoil)

50b. Plants are erect, 1.5–7 dm tall, with 2–9 cauline leaves and rosettes of basal leaves similar to the cauline; leaves usually have 5–7 leaflets, basal leaves not in ranks (distinct vertical rows); cymes have 7–100+ flowers; introduced species. **51**

50a. Plants are tufted or cespitose, flowering stems are erect or decumbent, to 1–3 dm tall or long; the primarily basal leaves have 5–7 leaflets and are 2-ranked (arranged in 2 vertical rows); cauline leaves are lacking or 1–2; cymes have 2–10 flowers; native species. **53**

51a. Stems are erect or decumbent, 1–5 dm tall or long; petioles are 1–4 cm long; leaflets are oblanceolate, the central leaflet is 1–3 cm long × up to 1 cm wide; leaflet margins have 5–7 teeth (2–3 on each side + 1 terminal tooth); upper leaflet surfaces are green and sparsely pubescent to glabrous; lower leaflet surfaces are densely white-tomentose; lower cauline leaves have long petioles, decreasing in size and length in upper leaves; uppermost leaves are sessile; cyme are open, with 10–80 flowers, inflorescence branches are white tomentose; petals are 2–4 mm long, obovate and retuse; achenes are 30–60, with smooth or slightly rugose surfaces. ..... ***Potentilla argentea*** (silvery cinquefoil)

51b. Stems are erect, 1.5–7 dm tall; petioles are 2–10 cm long; leaflets are oblanceolate to obovate, the central leaflet is up to 10+ cm long × 1–3.5 cm wide; leaflet margins have 11–35 teeth (5–17 on each side + 1 terminal tooth); plants are pubescent, with soft or stiff hairs; cymes are open, with numerous flowers, inflorescence branches have straight to ascending hairs, not woolly; petals are 3–10 mm long, obovate or obcordate; achenes are 40–140, with rugose surfaces. **52**

52a. Leaflets are 5–7 and oblanceolate; the central leaflet is 1.5–10+ cm long; leaflet margins have 15–35 teeth (7–17 on each side + 1 terminal tooth); petals are obcordate, pale yellow, deepening to bright yellow at the base, 7–10 mm long and wide, petal margins are touching to slightly overlapping; calyx lobes are 4–10 mm long; epicalyx bractlet are 5–12 mm long; achenes are 80–140; plants are pubescent, with stiff, straight hairs, 2–4 mm long. .... ***Potentilla recta*** (sulphur cinquefoil)

52b. Leaflets are 5 and oblanceolate to obovate; the central leaflet is 2–4.5 cm long; leaflet margins have 11–21 teeth (5–10 on each side + 1 terminal tooth), petals are obovate, bright yellow, 3–5 mm long × up to 3 mm wide, separate, with margins not overlapping; calyx lobes are 3.5–6.5 mm long; epicalyx bractlet are 2–5 mm long; achenes are 40–70; plants are pubescent, with soft, straight to ascending hairs, 1–2 mm long. ..... ***Potentilla intermedia*** (downy cinquefoil)

53a. Basal leaves have 5–6 leaflets, occasionally 7; petioles are 1–8 cm long; leaves are bluish-green and glaucous; leaflets are oblanceolate to obovate, the central leaflet is 1–4 cm long × about 1.5 cm wide, leaflet margins are deeply toothed, with 3–21 teeth (1–10 on each side + 1 terminal tooth), nearly pinnatifid in basal leaves; flowering stems up to 3 dm tall, often bearing 1–2 cauline leaves; cymes are open, with 2–10 flowers; petals are 5–10 mm long; achenes are 25–40 and smooth. .... ***Potentilla glaucophylla*** subsp. ***glaucophylla*** (blueleaf cinquefoil)

53b. Basal leaves usually have 5 leaflets; petioles are up to 6.5 cm long; leaves are green and glabrous, not glaucous; leaflets are obovate, the central leaflet is 1.5–3.5 cm long × about 1–1.5 cm wide; leaflet margins have 7–11 teeth (3–5 on each side + 1 terminal tooth); flowering stems are up to 2 dm tall, cauline leaves are usually absent; cymes are open, usually with 3–8 flowers; petals are 4–7 mm long; achenes are 30–40 and smooth. .... ***Potentilla crantzii*** (Crantz's cinquefoil)

54a. Leaves have 2–11 pairs of leaflets + 1 terminal leaflet; petals are yellow, obovate, obcordate, or nearly orbicular (*Potentilla*, in part). **55**

54b. Leaves have 2–17 pairs of leaflets + 1 terminal leaflet, sometimes with several much smaller (minor) leaflets interspersed along the rachis between the larger (major) leaflets; petals are absent, or present and white, yellow, pink, or red, and of various shapes. **59**

55a. Plants are stoloniferous, with long trailing red stolons, rooting at the nodes; leaves all basal, with 2–11+ pairs of leaflets + 1 terminal leaflet, sometimes also with much smaller leaflets on the rachis between the larger leaflets (these are not counted in the number of leaflets); leaflets are oblong or oblanceolate, seldom obovate, up to 6 cm long × up to 2 cm wide; leaflet margins are flat, with 2–12+ pairs of teeth; cauline leaves are absent; stamens are usually 20; petals are 5–15 mm long × 3–10 mm wide and obovate to nearly orbicular (*Potentilla anserina*). **56**

55b. Plants not stoloniferous; leaves are primarily basal, usually with 2–3 pairs of leaflets + 1 terminal leaflet; leaflets are nearly pinnatifid, their margins cut more than 2/3 to the midrib; leaflet margins are revolute, with 1–8 pairs of teeth; cauline leaves are 1–4; stamens are 15–20; petals are 3–5 mm long × 2–4 mm wide and obovate. **58**

56a. Leaves have 2–4, rarely 5, pairs of leaflets + 1 terminal leaflet; larger leaflets are up to 2 cm long, with 2–6 lanceolate, blunt teeth on each side; lower leaf surfaces are glabrous to finely tomentose; epicalyx bractlets are shorter than the sepals; stolons and petioles are glabrous. .... ***Potentilla anserina*** subsp. ***groenlandica*** (Greenland silverweed)

56b. Leaves have 4–15 pairs of leaflets + 1 terminal leaflet; larger leaflets have 4–16 sharply serrate teeth on each side; lower leaf surfaces are densely white-tomentose; epicalyx bractlets are about equal in length or shorter than the sepals; stolons and petioles are densely to sparsely villous or glabrous. **57**

57a. Leaves are 3–20 cm long, with 5–12 pairs of leaflet + 1 terminal leaflet; each leaflet usually has 4–11+ teeth on each side; stolons are densely to sparsely villous; epicalyx bractlets are about equal in length to the calyx lobes; flowers are 1–1.5 cm across; achenes are 20–60, with a shallow groove on the upper surface. .... ***Potentilla anserina*** subsp. ***anserina*** (cinquefoil)

57b. Leaves are usually 10–50 cm long, with 4–15 pairs of leaflets + 1 terminal leaflet; each leaflet usually has 4–16 teeth on each side; stolons are glabrous to sparsely pubescent;

epicalyx bractlets are shorter than the calyx lobes; flowers are 1–2.5 cm across; achenes are 50–200+ and lack a shallow groove on the upper surface. .... ***Potentilla anserina*** subsp. ***pacifica*** (cinquefoil)

58a. Plants of limestone barrens on the upper Northern Peninsula and northernmost Labrador; leaves usually have 5 oblong to obovate leaflets, the lowest pair smaller and often hidden by the adjacent upper pair; leaflets are white pubescent on both surfaces, sparsely to densely pubescent above with long shaggy or woolly hairs (villous or lanate), and densely pubescent beneath, with matted woolly hairs (tomentose); larger leaflets are up to 3 cm long × up to 1.2 cm wide, with 5–11 oblanceolate, blunt to rounded teeth (2–5 pairs + 1 terminal tooth), lower leaflets often have just 3 teeth; petioles are <1–4 cm long; flowering stems usually have 1–3 flowers (rarely more), in open cymes; pedicels and calyx lobes are densely villous; petals are 4–5 mm long × 2–3 mm wide and separate (margins not or seldom overlapping). ..... ***Potentilla pulchella*** (Burnt Cape cinquefoil)

58b. Plants of coastal areas in s/c Labrador and w/nw Nfld., usually on basic substrates; leaves have 5–7 oblong to oblanceolate leaflets; upper leaflet surfaces are green and sparsely pubescent with stiff, ± appressed (strigose) hairs, lying flat on the blade surface; the lower surface is greyish-green, with a somewhat denser layer of long hairs; the central leaflet is 2–5 cm long × 1–2.5 cm wide, with 11–17 elliptic to lanceolate teeth (5–8 pairs + 1 terminal tooth), ascending or slightly outward-curved; petioles are 2–8 cm long; flowering stems usually have 5–30 flowers in compact cymes; pedicels and calyx lobes are finely pubescent with short hairs; petals are 3–5 mm long, often wider than long and usually with overlapping margins. ..... ***Potentilla litoralis*** (coastal cinquefoil)

59a. Flowers are solitary or few (less than 20) in open, terminal cymes; petals are yellow, pinkish, or red; the fruit is an aggregate of 20–250+ achenes (an achenetum). **60**

59b. Flowers are numerous (about 20–500+) in spikes, spike-like racemes, or branched inflorescences; petals are white, pink, yellow, or absent; the fruit is a single achene or an aggregate of 6–18 achenes (an achenetum). **62**

60a. Plants are stoloniferous, with creeping to ascending stems, 1–10 dm long; leaves are all cauline, alternate, 2–15 cm long, usually with 5–7 elliptic, oblong, or oblanceolate leaflets, each 1.5–10 cm long × 1–5 cm wide; leaflet bases are cuneate to obtuse, apices are rounded; margins are serrate, usually to below the middle; lower leaflet surfaces are glaucous; leaves subtending the inflorescence may be simple or with 2–3 leaflets; flowers are 1–10; calyx lobes are 7–12 mm long, lanceolate, reddish-brown or dull purple to green at the apex; petals are red, 2.5–6 mm long, oblanceolate, often abruptly narrowing to an apiculate apex; epicalyx bractlets are shorter than the calyx lobes, but longer than the petals; stamens are 20–25, anthers are dark purple; the dome-shaped torus is spongy in fruit; achenes are ovoid, to 1.6 mm long; plants of shallow, aquatic and wetland habitats. .... ***Comarum palustre*** (marsh cinquefoil)

60b. Plants are erect, 3–11 dm tall; basal leaves have 1–3 large leaflets near the apex, 4–8 major lateral leaflets that decrease in size towards the petiole, and 4–15 much smaller, minor lateral leaflets scattered along the rachis between the major leaflets; cauline leaves are smaller, with 3 leaflets, or are simple and 3-lobed, sessile or borne on short petioles; lower leaflet surfaces are slightly paler; flowers are 2–16; calyx lobes are up to 10 mm long, green to red-violet or maroon; petals are yellow or various shades of pink, to 10 mm long, orbicular or obovate, and rounded or retuse at the apex; epicalyx bractlets are present or absent, stamens are numerous (25–100+), anthers are yellow; the conical to dome-shaped torus is dry and bristly in fruit; achenes taper at both ends (fusiform), and terminate in a long, slender beak (the persistent style), jointed and bent (geniculate) at the tip; the lower segment of the style is persistent and sparsely to densely stipitate-glandular; the terminal J-shaped portion of the style is eventually deciduous; plants of forested and wetland habitats (*Geum*). **61**

61a. Basal leaves are 6–40 cm long, with 3 large obovate to fan-shaped (flabellate) leaflets near the top; the central terminal leaflet is cuneate at the base, with 3–5 shallow, rounded lobes at the apex, margins are serrate; the 2 adjacent lateral leaflets are slightly smaller but similar in shape to the terminal leaflet; the remaining 2–4 major lateral leaflets are smaller, broadly elliptic to ovate, obtuse to acute at the base and apex, with coarsely serrate margins; present between the major laterals are 7–14 much smaller, minor lateral leaflets; lower cauline leaves have 3 obovate leaflets and a few minor leaflets; upper cauline leaves are 3-lobed with acute to acuminate apices; flowers are 2–8 and nodding; calyx lobes are triangular, red-violet to maroon, 7–10 mm long, and erect; the linear epicalyx bractlets are 2–4 mm long; petals are yellow or pink to salmon-coloured, obovate, erect, 8–10 mm long, and about equal in length to the calyx lobes; the lower style segment of each achene is 5–9 mm long, the J-shaped upper segment is 3–4.5 mm long with feathery hairs nearly to the tip. ..... ***Geum rivale*** (water avens)

61b. Basal leaves are 10–45 cm long, with one large 3–9-lobed terminal leaflet, cordate at the base, rounded at the apex, and with serrate margins; there are 4–8 nearly opposite, major lateral leaflets and 4–15 minor lateral leaflets along the rachis; cauline leaves are simple and 3-lobed; flowers are 3–16, erect; calyx lobes are triangular, green, 2.5–5.5 mm long, and soon reflexed; epicalyx bractlets are absent, or if present, no more than 2 mm long; petals are yellow, obovate or orbicular, spreading, 3.5–7 mm long, and longer than the calyx lobes; the lower style segment of each achene is 2.5–6 mm long, the J-shaped upper segment is 1–2 mm long, with a few short hairs below the middle. .... ***Geum macrophyllum*** (largeleaf avens)

62a. Flowers are arranged in elongate, erect spikes, or arching, spike-like racemes, 0.5–2 dm long; petals are yellow, white, or if absent, with 4 greenish-white, petaloid calyx lobes; the solitary achene is surrounded by the persistent hypanthium; basal leaves have 2–8 pairs of major lateral leaflets, minor leaflets are present or absent; the terminal leaflet is unlobed; cauline leaves are shorter, with fewer pairs of lateral leaflets; native plants of various moist, rich habitats. **63**

62b. Flowers are arranged in elongate, erect, corymb-like panicles (anthelae), 1–2.5 dm long, with lateral flowering branches longer than the central branch; petals are 5–7, obovate, white or cream-coloured, often pink-tinged in bud, and 2.5–8 mm long; stamens are 20–30; achenes are 3–18 per flower, 3–5 cm long, straight or twisted, and free from the hypanthium; the tip of each achene bears a persistent, small or knob-like stigma; basal leaves have 2–17 pairs of major lateral leaflets and several pairs of minor leaflets scattered along the rachis; the terminal leaflet is 3–5 lobed; cauline leaves are shorter, with fewer pairs of lateral leaflets; introduced plants, naturalized in fields, along roadsides, and other disturbed habitats. **64**

63a. Flowers are numerous in elongate, dense, erect spikes, 1–2 dm long; petals are absent, calyx lobes are 4 and greenish-white; the 4 stamens have flat filaments 6–10 mm long; the fruit is a small achene; basal leaves have 3–8 pairs of oblong or lanceolate leaflets, to 10 cm long × 4 cm wide, usually with ± cordate bases, obtuse to rounded apices, and serrate margins; the terminal leaflet is similar in size and shape to the lateral leaflets; cauline leaves are similar to basal leaves, but have fewer, smaller pairs of leaflets; minor leaflets are absent. ..... ***Sanguisorba canadensis*** (bottlebrush)

63b. Flowers are numerous in elongate, erect, spike-like racemes, 0.5–2 dm long; petals are yellow, stamens are 5–15, shorter than the petals, and with filiform (thread-like) filaments; the single achene is enclosed within an obconical or top-shaped hypanthium, 2.1–6.6 mm long × 2.4–5.2 mm wide, with 3–5 rows of spreading to erect, hooked bristles around the rim; the hypanthium sides are vertically grooved, with small hairs in each groove; leaves are basal and cauline; basal leaves have up to 5 pairs of lateral leaflets, cauline leaves usually have 2–3 pairs of lateral leaflets; the terminal leaflet is rhombic to obovate, lateral leaflet pairs are lanceolate to obovate, widest near the middle, with tapering or obtuse bases and acute to acuminate apices; margins are coarsely toothed, often to below the middle; pairs of minor leaflets are present between each pair of major leaflets. ..... ***Agrimonia striata*** (woodland agrimony)

64a. Basal leaves have a palmately 3–5-lobed terminal leaflet and 2–4 pairs of lateral, ovate leaflets, 2–5 cm long; lower leaflet surfaces have short, tomentose hairs that do not obscure the veins; inflorescences are dense, usually with >100 flowers on finely pubescent branches and pedicels; the 5–6 petals are 2.5–5 mm long; achenes are 6–8 per flower, narrow, flattened, spirally-twisted, and glabrous. .... ***Filipendula ulmaria*** (queen-of-the-meadow)

64b. Basal leaves have a 3-lobed terminal leaflet and 7–17 pairs of lateral, lanceolate leaflets, up to 3 cm long; lower leaflet surfaces are glabrous, except on larger veins; inflorescences are relatively open, with <100 flowers on glabrous branches and pedicels; the 6–7 petals are larger, 5–8 mm long; achenes are 10–18 per flower, oblanceolate, straight, ascending, and densely pubescent, with ascending to appressed, stiff, brown hairs. ..... ***Filipendula vulgaris*** (dropwort)

65a. Dwarf shrubs with prostrate, creeping stems; leaves are elliptic to obovate; upper leaf surfaces are dark green and ± glabrous, the lower leaf surface is white-tomentose; venation is pinnate; flowers are solitary and terminal; the outer surface of the calyx is pubescent, with purplish-brown hairs and stipitate glandular hairs; epicalyx bractlets are absent; calyx lobes and petals are 8–10; stamens are 40–130; the fruit is an aggregate of 20–40 achenes, each ending in a persistent, feather-like style, about 1–4 cm long, all spirally twisted when immature (*Dryas*). **66**

65b. Low, herbaceous plants with basal leaves usually less than 2 dm long; flowering stems are up to 8 dm long; leaves are palmately 5–11-lobed, broadly cordate, reniform, or nearly orbicular**,** 2–9 cm long × about 4–12 cm wide; venation is palmate; flowers are solitary or numerous in compound cymes; the outer surface of the 4–5 calyx lobes is sparsely pubescent or glabrous, epicalyx bractlets are present or absent, petals are 4–5 and white, or absent; stamens are 4–40; the fruit is either an aggregate of drupelets, or a single achene surrounded by the persistent hypanthium. **67**

66a. Leaves are narrowly oblong or lanceolate, usually 0.5–2.2 cm long × <1 cm wide, unlobed or with 2 small teeth-like lobes at the base of the blade; apices are obtuse to acute; bases are rounded, truncate, or slightly cordate; margins are entire and revolute; flowers are erect, on peduncles to 1.5 dm tall; petals are usually 8, creamy-white, 5–14 mm long × 5–11 mm wide, and ovate or obovate. .... ***Dryas integrifolia*** (entire-leaf mountain avens)

66b. Leaves are elliptic, oblong, oblanceolate, or obovate, up to 3.8 cm long × up to 2.4 cm wide, bases are narrow (cuneate), apices are obtuse to rounded, margins are crenate and flat; flowers are nodding, on peduncles to 2.3 dm tall; petals are 8–10, yellow, 8–12 mm long × 4–7 mm wide, and oblanceolate to obovate. .... ***Dryas drummondii*** (Drummond's mountain avens)

67a. Leaves are broadly cordate to nearly orbicular, with 5–7 rounded lobes, bases are cordate; blades are 2.5–6 cm long × about 5–8 cm wide and often rugose, margins are serrate or dentate, with broad, low teeth; flowers are solitary, unisexual, with male and female flowers on separate plants (dioecious); calyx lobes and petals are 4–5; stamens are 25–40; the fruit is an aggregate of drupelets, 1–1.5 cm long, red and opaque when immature, translucent golden-yellow at maturity. ..... ***Rubus chamaemorus*** (bakeapple)

67b. Emerging leaves are strongly folded along the midrib and sinuses (plicate), flat between the folds, reniform to nearly orbicular in outline, and have 7–11 rounded, obtuse, or triangular lobes; blades are about 2–9 cm long × 4–12 cm wide; margins are serrate, the broad-based teeth bear small tufts of white hairs at the tip; flowers are numerous and small, 2–4 mm across, arranged in compound cymes, each branches bearing clusters (cymules) of 10–30 yellowish-green to yellow flowers; the bisexual flowers have a hypanthium, tapering or rounded at the base, and 4 triangular calyx lobes that alternate with 4 epicalyx bractlets; stamens are 4; petals are lacking; the top of the hypanthium, nearly closed by a nectar disc, has a circular opening through which the style and stigma of the single pistil extend; at maturity, the small achene is surrounded, at last towards the base, by the persistent hypanthium (*Alchemilla*). **68**

68a. Upper portions of the stems and petioles are glabrous, or sometimes pubescent near the base; lower leaf surfaces are glabrous between the veins; inflorescence branches, peduncles, and pedicels are usually glabrous; the hypanthium is glabrous or sparsely pubescent; the single achene is exserted (extending beyond the top of the hypanthium). **69**

68b. Stems are densely pubescent throughout, or only on the upper or lower portions; petioles are densely pubescent with appressed or spreading hairs; lower leaf surfaces are usually densely pubescent; inflorescence branches are moderately to densely pubescent; peduncles, pedicels, and the hypanthium are glabrous to densely pubescent; the achene may be exserted or enclosed within the hypanthium. **70**

69a. Stem bases have spreading hairs; leaves usually with 7–9 lobes; the upper leaf surface has spreading to ascending hairs, at least along the folds; veins on the lower leaf surface are usually glabrous; flowering stems, peduncles, and pedicels are glabrous; the hypanthium is usually sparsely hairy, occasionally glabrous; native plants of meadows and peaty limestone barrens in wNfld. and seLabrador. .... ***Alchemilla filicaulis*** subsp. ***filicaulis*** (thread-stem lady's mantle)

69b. Stem bases and petioles have appressed hairs; leaves with 7–11 lobes; the upper leaf surface is glabrous or nearly so (slightly hairy towards the margins and sometimes on the midrib); veins on the lower leaf surface are hairy throughout or only towards the margins; flowering stems, peduncles, pedicels and the hypanthium are glabrous; introduced plants, reported only from Tilt Cove, neNfld., with one historical (1891) record from seLab. .... ***Alchemilla glabra*** (smooth lady's mantle)

70a. Flowers with a sparsely to usually densely pubescent hypanthium. **71**

70b. Flowers usually with a glabrous hypanthium. **73**

71a. Plants are relatively large, with flowering stems to 8 dm long; leaves are yellowish-green to greyish-green, densely hairy on both surfaces with soft, velvety (velutinous) hairs; lobes are usually 9–11 and rounded; epicalyx bractlets are nearly as long and wide as the calyx lobes. ..... ***Alchemilla mollis*** (garden lady's mantle)

71b. Plants are smaller, with flowering stems 1–4 dm long; leaves are grass green or bluish-green, both leaf surfaces are densely hairy with long spreading (pilose) or stiff, appressed (strigose) hairs; lobes are 7–11 and rounded; epicalyx bractlets are shorter and narrower than the calyx lobes. **72**

72a. Leaves usually with 7–9 lobes, the sinus (angle between the basal lobes) is usually wide, the basal lobes not overlapping; the hypanthium is 1.2–2 mm long, with a conical to obtuse base, veins visibly extend into the tips of the calyx lobes and epicalyx bractlets; native plants of meadows and peaty limestone barrens in wNfld. and seLabrador. ..... ***Alchemilla filicaulis*** subsp. ***vestita*** (hairy lady's mantle)

72b. Leaves usually with 9–11 lobes, the sinus (angle between the basal lobes) is narrow or nearly closed, the basal lobes often overlapping; the hypanthium is 1–1.5 mm long, with a rounded base, veins are not clearly visible; introduced plants, rarely found in disturbed ground in Nfld. .. ***Alchemilla monticola*** (mountain lady's mantle)

73a. Leaves with 7–9 rounded lobes; stems, petioles, and leaf surfaces are pubescent with appressed hairs, the upper surface sometimes sparsely so; the sinus (angle between the basal lobes) is narrow or closed, the lobes often overlapping; the main inflorescence branches are densely pubescent with appressed to ascending hairs; plants native to Labrador or introduced in seNfld. **74**

73b. Leaves with 7–11 rounded or triangular lobes; petioles and lower portions of the stems are densely pubescent with spreading to ascending hairs; lower leaf surfaces are somewhat to densely pubescent; the sinus (angle between the basal lobes) is narrow or wide, bases are not overlapping; main inflorescence branches are sparsely to densely pubescent with appressed to ascending hairs; introduced species of the St. John's, eNfld. area. **75**

74a. Leaves with shallow lobes, usually wider than long; the serrate margins have teeth with very short tufts of hair at the tip; upper blade surfaces are pubescent, with sparse to dense appressed hairs, and are often glaucous; epicalyx bractlets are narrower and noticeably shorter than the calyx lobes; native plants of northern Labrador, from the Postville and Makkovik areas northward. .... ***Alchemilla glomerulans*** (clustered lady's mantle)

74b. Leaves with lobes that are usually longer than wider; the serrate margins have teeth with prominent tufts of white hair at the tip; upper blade surfaces are glabrous, or pubescent only on the folds, but never glaucous; epicalyx bractlets and calyx lobes are about equal in length and width; introduced plants, reported only from coastal areas of the Burin Peninsula, seNfld. ..... ***Alchemilla venosa*** (veined lady's mantle)

75a. Leaves with 7–11 triangular lobes, obtuse at the apex, with nearly straight sides; the upper blade surfaces are glabrous to sparsely pubescent; the hypanthium is rounded at the base. ..... ***Alchemilla acutiloba*** (starry lady's mantle)

75b. Leaves with 7–9 rounded lobes, broadly rounded at the apex, with convex sides; the upper blade surfaces are densely pubescent, with silky, appressed hairs; the hypanthium is tapering (attenuate) at the base. ..... ***Alchemilla micans*** (gleaming lady's mantle)

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