

Menyanthaceae (Buckbean Family) in Newfoundland and Labrador

Traits, Key, & Comparison Charts

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The Menyanthaceae was formerly included in the Gentianaceae (Gentian Family), from which its species differ by the presence of alternate, petiolate, emergent or floating leaves and an adaptation to wetland or aquatic habitats. This plant family is represented in NL by only three species, two of which are native (*Menyanthes trifoliata* and *Nymphoides cordata*), and one introduced (*Nymphoides peltata*). *Menyanthes trifoliata* (bogbean) is the only member of the Menyanthaceae that occurs in both Labrador and insular Newfoundland.

Menyanthaceae Traits (for species in NL):

- **Emergent or floating aquatic perennial herbs** with creeping rhizomes.
- Leaves are **simple or compound**; *Nymphoides* has submersed, ovate basal leaves (rarely visible from above the water) and many **floating leaves on very long petioles with simple, cordate to orbicular blades**; *Menyanthes* has **emergent compound leaves, with stout petioles and 3 elliptic leaflets**; petiole bases are sheathing. Stipules are lacking; blade surfaces are glabrous.
- Flowers are solitary, or several in umbel-like clusters or terminal racemes; **flowers are 5-merous** (i.e., floral parts occur in multiples of 5).
- The **green calyx** is tubular at the base and **5-lobed** above.
- The **corolla is white** (often tinged with pink in bud) **or yellow, tubular at the base and deeply 5-lobed**, bearded on the inner surface (*Menyanthes*) or with entire to slightly fringed margins (*Nymphoides*). **A yellow glandular appendage**, sometimes called an epipetalous gland, **occurs to the base of each corolla lobe**.
- The **5 stamens** are fused to (inserted on) the inside of the short corolla tube. Some species have **dimorphic flowers** (i.e., of two forms), with filaments and styles of two sizes; plants with short filaments have long styles, plants with long filaments have short styles; a character that ensures cross-pollination.
- The ovary is **superior in *Menyanthes***, but **half-inferior in *Nymphoides***, with the perianth fused to the lower third of the ovary; the 2 fused carpels share a single locule; in dimorphic flowers, styles are of two sizes, otherwise, the style is short; the stigma is 2-lobed in all flowers.
- **Nectaries are present** at the base of the ovary.
- The fruit is a **capsule** that is indehiscent or irregularly dehiscent.

Menyanthaceae (Buckbean Family) Key

Key to species in Newfoundland and Labrador

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- 1a. Emergent aquatic herbs, from stout, creeping rhizomes; leaves are alternate and compound, with 3 leaflets (trifoliolate); petioles are stout, 3–20 cm long, with sheathing bases; leaflets are elliptic to oval, 2–8 cm long, with an obtuse or rounded apex and entire margins or occasionally broadly crenate; flowers are arranged in a terminal raceme; the calyx is 5-lobed; the corolla is 1.5–2 cm across, tubular at the base and deeply divided into 5 lobes that curve backward at maturity, corolla lobes are white, pink- to red-tinged on the outer surface, and densely bearded with numerous tangled white hairs (fimbriae) on the inner surface; the fruit is an ovoid capsule that dehisces irregularly.
..... ***Menyanthes trifoliata*** (bogbean, buckbean)
- 1b. Floating aquatic herbs, with short, horizontal rhizomes that produce long petiole-like stolons; cauline leaves are alternate, with slender petioles and simple floating blades, 1.5–15 cm wide, deeply cordate, with rounded apices and basal lobes, and shallowly crenate or dentate margins; flowers are solitary or in few-flowered umbel-like clusters; the corolla is broadly funnelform to nearly rotate, white or yellow, and 5-lobed, with a yellow, glandular appendage borne near the base of each lobe; corolla margins are entire, undulate, or shallowly fringed; the fruit is an indehiscent capsule. **2**
 - 2a. Corolla white, 0.5–1 cm across, lobe margins are entire; leaf blades are 1.5–5 cm long × 1.5–4 cm wide, margins are crenate; petioles are 2–5 cm long and bear clusters of slender, elliptic spur-roots; native, but rare in Nfld., known from only 4 locations. ***Nymphoides cordata*** (little floatingheart)
 - 2b. Corolla yellow, 2–4 cm across, lobes are undulate or puckered near the short-fringed margins; leaf blades are about 3–15 cm long and wide, margins are undulate or shallowly dentate; petioles are 5–10 cm long; spur-roots are lacking; introduced from Eurasia, very rare in Nfld., escaped from cultivation.
..... ***Nymphoides peltata*** (yellow floatingheart)

Menyanthaceae Comparison Chart			
Species:	<i>Menyanthes trifoliata</i>	<i>Nymphoides cordata</i>	<i>Nymphoides peltata</i>
	bogbean, buckbean	little floatingheart	yellow floatingheart
Stem	Perennial wetland herbs with stout, creeping rhizomes.	Perennial aquatic herbs with stout rhizomes and long, petiole-like stolons.	Perennial aquatic herbs with horizontal rhizomes and branched stolons to 2 m long.
Petioles	Stout, 12–20 cm long.	Slender, 2–5 cm long.	Slender, 5–10 cm long.
Leaves	Emergent, trifoliolate , the 3 elliptic to obovate leaflets are 2–8 cm long , ascending, apices obtuse to acute, bases cuneate, and margins entire or broadly crenate .	Alternate; floating blades are cordate, 1.5–7 cm long × 1.5–4 cm wide , green or mottled with purple above, the lower surface glandular and dark red; margins are crenate .	Alternate (opposite below the flowers); floating blades are cordate to ± orbicular, 3–15 cm long and wide , green or purple-mottled; margins undulate to shallowly dentate .
Spur Roots	Spur-roots are lacking.	Clusters of pendant, slightly curved spur-roots (tubers) borne at the top of the stolon .	Spur-roots are lacking.
Flowers	A single raceme with up to 30 flowers terminating a 1–3 dm long scape ; flowers are dimorphic.	Umbel-like clusters of several flowers, usually blooming one flower at a time , on slender pedicels 0.5–6 cm long; flowers are monomorphic .	2–5, in umbel-like clusters at the nodes, borne above the water surface on pedicels 3–7 cm long; flowers are dimorphic.
Calyx	3–5 mm long, green; tubular at the base, with 5 obtuse, oblong lobes .	3–5 mm long, green to purple; short-tubular at the base, with 5 acute, lanceolate lobes.	9–13 mm long , green, short-tubular, with 5 acute, linear-lanceolate lobes.
Corolla	White to pinkish, 1.5–2 cm across , 5-lobed, the tube about 3–5 mm long; lobes about 8 mm long, acute, spreading, heavily bearded on the inner surface , margins are entire.	White, 0.5–1 cm across , the tube is short, the 5 elliptic-ovate lobes are 4–5 mm long, sides of the corolla lobes are somewhat puckered , margins are entire.	Yellow, 2–4 cm across ; the tube is short, the 5 obovate spreading lobes are about 8–18 mm long, sides of the corolla lobes are undulate or puckered , margins are short-fringed.
Stamens	5, filaments adnate to the corolla tube, alternate with the corolla lobes.		
Pistil	Solitary, with a superior ovary ; styles are of 2 sizes , styles are persistent in fruit.	Solitary, with a half-inferior ovary; styles very short, often appearing absent .	Solitary, with a half-inferior ovary; styles are of 2 sizes .
Capsule	Broadly ovoid, about 8–10 mm long, dehiscent .	Ovoid, 3–5 mm long, beakless ; indehiscent.	Elliptic, 1.2–2.5 cm long, beaked ; indehiscent.

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