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FLORAL EMBLEM OF MASSACHUSETTS: MAYFLOWER (*Epigaea repens*, *Trailing Arbutus*)

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The aim of our paper was to study and describe floral emblem of Massachusetts: Mayflower (Fig. 2).

Mayflower (*Epigaea repens*) is the Massachusetts State Flower and the provincial flower of Nova Scotia. The Mayflower also called *Trailing arbutus* is a creeping eastern North American plant, of the heath family. Mayflower is native throughout eastern North America, from Labrador to Manitoba and south to Florida and Mississippi. Mayflowers are terminal clusters of fragrant pink or white flowers [13].



Fig. 1. T. Sokolov [27; 31], N. Varenya and Y. Nakonechniy Y. [21; 22]. **Fig. 2.** *Epigaea repens*.

The scientific name, *Epigaea repens*, coined by Linnaeus (Fig. 3) in 1753 from Greek and Latin, literally means **creeping (or running) on the earth**, which is an apt description of the way mayflower grows, its long, woody stems clinging tightly to the ground.

Other common names of Mayflower are: *Gravel plant*, *shadflower*, *ground laurel*, *mountain pink*, *winter pink* [13; 36].

Fig. 3. Carl Linnaeus.



Mayflower typically grows in sandy or rocky, acid soils in woods and clearings, often on hillsides and banks, including road banks, especially under oaks and pines or hemlocks with such other ericads as mountain-laurel [13].

Thus, *Epigaea repens* is the floral emblem of both Nova Scotia (Latin for "New Scotland" (Fig. 4). It is one of the thirteen provinces and territories of Canada) and Massachusetts (Fig. 5). Digging up one in Massachusetts is punishable with a \$50 fine [7].



Fig. 4. Nova Scotia (Canada).



Fig. 5. The Commonwealth of Massachusetts (USA).

Trailing Arbutus is sometimes referred to as "Plymouth Mayflower" in reference to the fact that it was the first flower to cheer the hearts of the Pilgrim Fathers after the rigors of their first New England winter. (Strickland)" [29].

By the mid-1640s population of Massachusetts numbered about 3,000 people. The colonists who traveled to the New World on **the Mayflower** (Fig. 6) [32] were a small group of Separatists who had fled to Holland from England to practice their religion without official interference. Economic hardship and a desire to establish an identity free of Dutch influence prompted them to seek out America. The Pilgrims were never granted a royal charter; their government was based on the Mayflower Compact, a document signed by 41 male passengers on the Mayflower five weeks before their arrival in the New World. The compact was hardly democratic, since it called for rule by the elite, but it established an elective system and a basis for limited consent of the governed as the source of authority [12].

The Massachusetts Bay Colony expanded rapidly. By the mid-1640s it numbered more than 20,000 people, and it began absorbing settlements in Maine and New Hampshire [12].



Fig. 6. Mayflower II, replica of the original Mayflower, Plymouth.

John Winthrop (1587/8–1649) (Fig. 7) was a wealthy English Puritan lawyer, and one of the leading figures in the founding of the Massachusetts Bay Colony (Fig. 8), the first major settlement in New England after Plymouth Colony.



Fig. 7. Joh Winthrop.



Fig. 8. Massachusetts, political map with capital Boston.

Epigaea (Fig. 11) was used medicinally by native Americans [15] for several ailments. For instance, the Algonquin used an infusion of the leaves for kidney disorders. The Iroquois (Fig. 9) treated rheumatism with a compound decoction of the plant. The Cherokee (Fig. 10) took a decoction of the plant for abdominal pains [36], see videos [1; 16; 17].



Fig. 9. Council House of the Iroquois by Howard Everett Smith (American, 1885–1970).



Fig. 10. Cherokee Indians.

In the 1890s and early 1900s, public concern grew that this unchecked collecting Mayflower endangered the species and might lead to its extirpation [14].

Perhaps named by the Pilgrims, the Mayflower was suggested as the Massachusetts floral emblem as early as 1893 when the Women's Congress at the Chicago World's Fair (The World's Columbian Exposition) began promoting the idea of a "National Garland of Flowers."



Fig. 11. *Epigaea repens*.

Two bills proposing the mayflower as the Massachusetts' floral emblem were introduced, one in 1900 and a second in 1901. Both failed to gain legislative approval. A bill to name mountain laurel the state's floral emblem was introduced in 1905. It too was defeated.

A third bill in support of the Mayflower, introduced by Representative Miles A. O'Brien, Jr. was the charm. Unfortunately a competing bill, proposing the water lily as the floral emblem, was also introduced. The General Court decided to pass the issue on to the Department of Agriculture who, in turn, passed the issue on to the State Board of Education. It was determined that a statewide vote of school children would determine the state's floral emblem.

Put to the children of Massachusetts, the mayflower received more than twice as many votes as the water lily.

- Mayflower – 107,617 votes
- Water lily – 49, 499 votes [11; 25].

The General Court of the Commonwealth of Massachusetts on May 1, 1918, adopted the Mayflower (*Epigaea repens*)



Fig. 12. The Mayflower blooms.

also commonly known as trailing arbutus or ground laurel, as the flower or floral emblem of the Commonwealth.

On May 17, 1925, Section 7 was amended to protect the endangered mayflower [20] (Fig. 12).

Section 7: Flower or floral emblem of commonwealth; protection; penalty

Section 7. The mayflower (epigaea repens) shall be the flower or floral emblem of the commonwealth. Any person who pulls up or digs up the plant of the mayflower or any part thereof, or injures such plant or any part thereof except in so far as is reasonably necessary in procuring the flower therefrom, within the limits of any state highway or any other public way or place, or upon the land of another person without written authority from him, shall be punished by a fine of not more than fifty dollars; but if a person does any of the aforesaid acts while in disguise or secretly in the nighttime he shall be punished by a fine of not more than one hundred dollars. The provisions of this section shall be enforced by all officers in the division of law enforcement in the department of fisheries, wildlife and environmental law enforcement [17], see the video [22].

The Mayflower blooms (Fig. 12) are waxy, exquisitely sweet-scented flowers intensifying with age. The small, crowded clusters of Mayflower are borne in the axils of the leaves and at the tips of the stems. Mayflower blooms are often hidden from view by the leaves, especially early in the season.

Mayflower requires acidic soils and is often associated with white pine, oaks, and hemlocks. The brown spots visible on the leaves (1, 20) were likely left by the larvae of the leaf-mining beetle *Brachys howdeni* (Fig. 13), which specializes in eating *Epigaea*. Other nibbles along leaf edges may have been left by the caterpillars of the twirling moth *Aroga epigaeella*, another insect that depends on *Epigaea* to complete its life cycle. Its beautiful and fragrant flowers range in color from white to pink [14].

Epigaea leaves are astringent, leathery, and covered in coarse hairs to discourage herbivory, though the larvae of some insects specialize in eating them (Fig. 13). These include the leaf-mining beetle *Brachys howdeni* [5], and a species of twirler moth aptly named *Aroga epigaeella*. It is also a likely host plant for the hoary elfin butterfly (*Callophrys polios*), a species that is declining significantly in the eastern part of its United States range [14; 29].



Fig. 14. *Epigaea* leaves.



Fig. 15. *Callophrys polios*.

Fig. 13. *Brachys howdeni*.

Also, *Epigaea repens* – known as *mayflower* or *trailing arbutus* – is a low, spreading shrub in the Ericaceae family. It is found from Newfoundland to Florida, west to Kentucky and the Northwest Territories (Fig. 16). The species flowers are pink fading to nearly white (Fig. 18, 19, 20), very fragrant, about 5 inches (1.3 cm) across when expanded, few or many in clusters at ends of branches (Fig. 19).

Calyx of five dry overlapping sepals; corolla salver-shaped, the slender, hairy tube spreading into five equal lobes (Fig. 19); 10 stamens; one pistil with a column-



Fig. 16. Trailing Arbutus habitat. Fig. 17. A clump of Trailing Arbutus. Fig. 18. Transparent petals. Photos by Peter M. Dziuk.

like style and a five-lobed stigma (Fig. 20). **Stem:** Spreading over the ground (*Epigaea* = on the earth); woody, the leafy twigs covered with rusty hairs (Fig. 3; 4).

Leaves: Alternate, oval, rounded at the base, smooth above, more or less hairy below, evergreen, weather-worn, on short, rusty, hairy petioles (Fig. 18, 21). Slow growing, it prefers moist, acidic (humus-rich) soil, and shade. It is often part of the heath complex in an oak-heath forest [18], see the videos [6; 30], Fig. 16, 17, 18, 21.



Fig. 19. Transparent pink flowers.

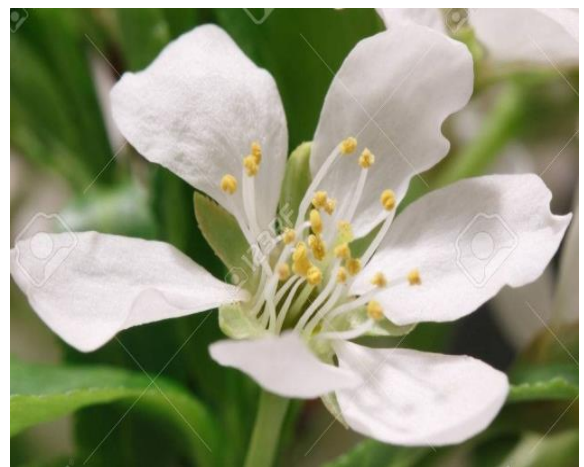


Fig. 20. A flower of *Epigaea repens*

The fruit of *Trailing Arbutus* (*Epigaea repens*), also known as “Mayflower,” is maturing. While this plant’s flower is familiar, its fruit may not be. Although it develops from the flower, and therefore is in the same location (under cover of *Trailing Arbutus*’s leathery leaves next to the ground), it is not as showy or as noticeable. In addition, the aromatic pink and white flowers that blossom in early spring infrequently set fruit. Out of a stand of well over 100 flowering *Trailing Arbutus* plants, only two could be found that bore fleshy white fruit (Fig. 22).



Fig. 21. Slow growing *Epigaea* prefers moist, acidic (humus-rich) soil, and shade.



Fig. 22. The fruit of *Trailing Arbutus* (*Epigaea repens*).

***Epigaea repens* (Mayflower): Biological Characteristics**

Kingdom: Plantae.
Division: Magnoliophyta
Class: Magnoliopsida.
Clade: Tracheophytes.
Clade: Angiosperms.
Clade: Eudicots.
Clade: Asterids.
Order: Ericales.
Family: Ericaceae.
Genus: *Epigaea*.
Species: *Epigaea repens* - Trailing-Arbutus.
Binomial name: *Epigaea repens* L.
Common Name: Mayflower, Trailing arbutus, Plymouth Mayflower, Ground Laurel.
Plants: trailing/creeping, perennial (Fig. 23), 1"-3" tall shrub; stems branching.
Habitat: moist; bogs, forests; in sandy, rocky, acidic soil
Conservation Status: Native
Range: Eastern N. America: from Newfoundland to Florida and west to Tennessee, Ohio and Michigan.
Height: 4-6 inches.
Leaves: evergreen, leathery, alternate, oval to oblong with a rounded to heart-shaped base, stalk hairy and half as long as the leaf (Fig. 22).
Stem: Woody, leafy twigs covered with rusty hairs (Fig. 24).
Flowers: Pink, disappear to almost white.
Bloom Time: Mar , Apr , May.
Calyx: Five dry overlapping sepals.
Stamens: 10.
Pistil: A column-like style and a five-lobed stigma.
Corolla: Salver-shaped, the slender, hairy tube spreading into five equal lobes.
Aroma: Fragrant flowers with a slightly sweet smell.
Fruit: Whitish berry that looks like a raspberry.
Roots: Live in a partnership arrangement (mycorrhiza) with a fungus [14].
Fruits: fleshy, round, berry-like, pulpy, white inside[9; 14; 29; 36]



Fig. 23. Leaves.



Fig. 24. Stem with white flowers.



Fig.25. *Epigaea repens* (Mayflower).

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