



Spring 2017

Grow milkweed for monarchs

The hackberry and its emperor

The Leaflet

Newsletter of the Morgan Arboretum

Waiting for Newts

By Jim Fyles, Director

Perhaps you know the place. It's on the Blue Trail just where it crosses the Snowshoe Trail, near the fields along the southern edge of the Arboretum. Coming around that corner the trail stretches ahead, straight, with a view along rows of corn stubble poking through the snow, toward the College and Ste-Anne. Early on a February morning the slanting rays and birches alongside the trail paint purple shadows across the track. The depths of the ski tracks, too, are purple streaks stretching ahead, but the crests of their top edges catch the sun with an explosion that lights the scene in brilliant gold. On other days, at other times, perhaps the place is ordinary, but not on this day. On this day it is a special place.

Perhaps you know the place. If you ski across the old Bobolink Field and come to the corner near the spruce/larch plantation where the crab-apple tree still offers up sustenance for waxwings, if you talk yourself out of skiing beneath the cedars and instead bear left, you come to North Grove. Up a bit of a rise and around a gentle bend there is a long glide between the maples toward a narrow gap in a stone wall, now piled in snow. Beyond the gap is the field glowing with a bit of the pink from the clouds above in the setting sun. On other days, at other times this place, too, might be ordinary. But today it is something special.

The Arboretum is full of special places. Perhaps there are some that are special to everyone all of the time; some are special to some of us some of the time and some are special just for an instant and just for us alone. What makes them special is something to do with the lay of the land, how the trees have grown, how the undergrowth has filled in, what living things sit in the midst and watch us watching, and how the light slants its way between the branches. But it has as much, also, to do with us; how our lives have been unfolding, how our day has gone, our current joys and worries. The place and ourselves, we together, make it special.

On that late afternoon of the pink field and sky, as we drove homeward, we noticed birds flying from all directions into that small, fenced tree plantation in the field next to the entrance road. You know the place. We slowed the car. The birds were robins; and not just a few,

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Milkweed and the monarch butterfly

By **Valentina Pieters**, Student Intern from Vanier College

Migration

Monarch butterflies migrate 8,000 km every year, in the longest and largest insect migration in North America!



A monarch butterfly ready to depart in fall

From Canada, monarchs travel all the way to northern Mexico. In order to survive, individual insects do not complete the entire route themselves, however. Instead, the trip is shared between four generations that are born along the way, in Canada, the United States or Mexico. Monarchs are also known to take advantage of strong winds and may ride on rising currents of warm air to conserve energy.

Monarch conservation

According to the World Wildlife Fund (WWF), monarch butterflies are currently facing three threats: illegal logging, insufficient numbers of milkweed plants and

climate change. These threats contribute to the declining numbers of monarch butterflies that migrate to Mexico every winter.



A monarch egg about to hatch on the underside of a milkweed leaf

The larvae and adults rely on milkweed as their primary food source, which is why adults lay their eggs on milkweed plants. As its name implies, milkweed is considered a weed. This has led to the increased use of herbicides to eradicate it. Because milkweed populations are declining, people and organizations are trying to plant more milkweeds in their gardens.

Monarch's obligate host

The sole food source for just-hatched monarchs is milkweed. Adults will often lay their eggs on the underside of milkweed leaves so that, once hatched, the larvae can start feeding on the plant right away. In the adult stage, butterflies will sip nectar from the flowers. Unlike most other caterpillars, monarchs do not blend into their surroundings using camouflage but instead sport brightly coloured black, green and yellow stripes to scare off predators. The caterpillars taste bad and are toxic because they consume cardenolides from milkweed, which is a toxic steroid. Monarchs are able to sequester this toxic compound, which makes them less susceptible to predation. They are specialist herbivores

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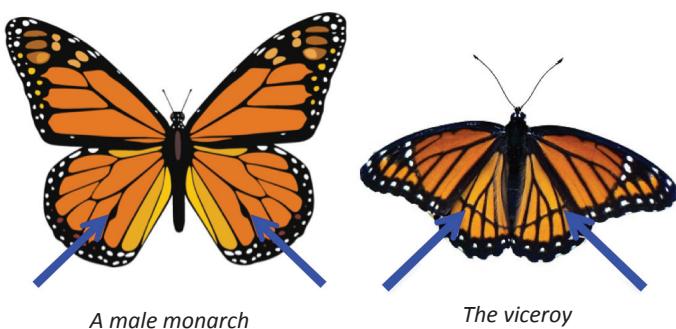


The unmistakable monarch caterpillar

of milkweed because of this. Monarchs spend about 12 days in the larval stage (as a caterpillar), going through five larval instars before they morph into adult butterflies. Adults do not eat milkweed but the cardenolides consumed as a caterpillar remain in their system into adulthood.

How do you tell the male and female monarch butterfly apart?

Look at the patterns on their wings. Males have two black spots on their hind wings, while females have a thicker black border.



Natural mimics: Can you differentiate between these similar species?

- Viceroy butterflies have a black line across their hind wing
- They are smaller than monarchs
- They fly faster and more abruptly than monarchs
- They do not migrate

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Why does the viceroy mimic the monarch's colouration?

Monarchs are toxic to many predators because of the milkweed they consume and their colouration acts as a warning of this. Some species, such as the viceroy butterfly, will mimic the colouration of monarchs even though they are not poisonous. This helps them confuse and ward off predators. We also find it tricky to tell them apart.

Common milkweed *Asclepias syriaca*

Common milkweed is probably the most familiar of all milkweeds in North America. It is well known for its lovely pink flowers arranged in umbels and for its seed pods with white silk in fall, which is blown about by the winds (and kids). This species grows freely in many different habitats, especially recently disturbed ones. It is a perennial and will come up in the same spot every year.



Common milkweed in a pasture by Tom Kingsbury

Common milkweed produces valuable fibres

Native Americans have been using common milkweed for many years as a source of fibre. The soft cotton-like fluff, called coma, is composed of individual fibres that are hollow, durable, water resistant, wax-coated, buoyant and hypoallergenic.

During the Second World War, the Japanese cut off the supply of kapok fibres to the United States. These fibres were derived from kapok trees and were used at the time for flotation in lifejackets. As a replacement, kids collected seedpods for a pittance and the seedpods were processed to extract their coma. The coma provided effective flotation in life vests just like kapok. Today, coma

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To all of the stars who together provide the sunshine
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there were hundreds. It seemed as if every branch held a row, and still they came from all corners of the sky. Clearly, on this day at this time, this place was special - special to robins, and through them, to us. We presume that the robins saw a safe place to spend the night in the small plantation with its blocks of deciduous and evergreen saplings. We can only wonder as to how they came to know of its existence. But clearly, for the robins it was a special place.

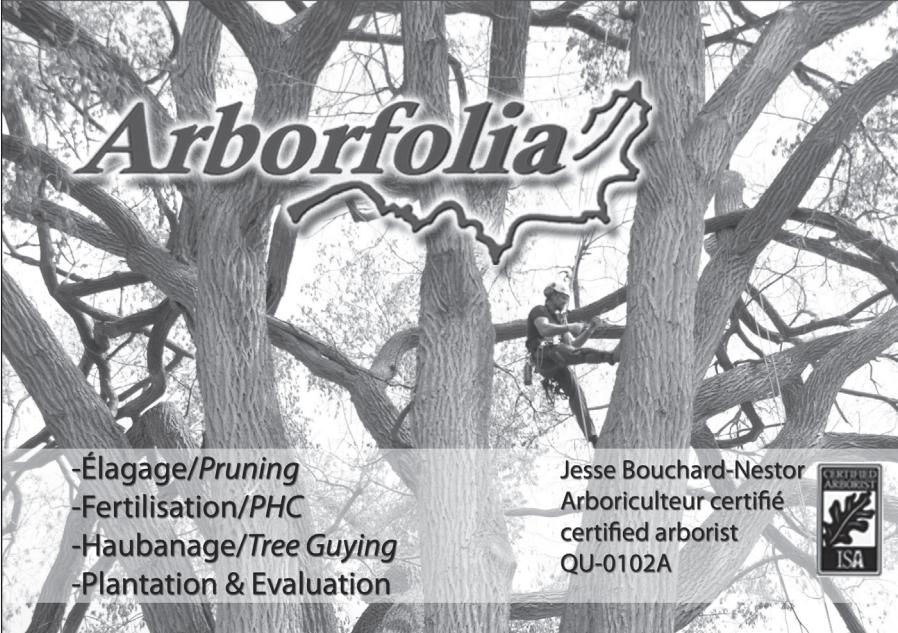
The Arboretum is also full of special places for the living things that make their homes there. Places with just the right combination of shade and soil moisture for Liparis, our rare orchid. Places with plenty of dead trees and branches that provide enough insects to raise families of pileated woodpeckers. Places with sandy slopes suitable for fox dens or with rich soils under hardwood trees creating just the right conditions for trillium and trout lilies in the spring.

Perhaps you know this place. It is a bit of gravel road between the Gatehouse and the first parking lot. If you look closely you will see that it has a culvert underneath, from a ditch that drains the side of the parking area and the field and woods beyond. This is a special place for newts. Newts are themselves

special. They breed, lay eggs and hatch into tadpoles in Stoneycroft Pond down below, across the road from the Gatehouse. When they have grown legs, they find their way up the slope, across the field and into the woods where they spend up to seven years before returning to the pond to find a mate. And, somehow, they choose that special place to cross the road. They choose warm wet nights in April. With some luck they get across without meeting a car tire. For us, it is the newts, and other amphibians that follow the same path, that make that place special. So when you visit, watch for the 'salamander crossing' signs and if it happens to be warm and raining, stop to look for newts in transit. They are one of the many sights that make the Arboretum special.

Take time this spring, summer and fall to visit the places in the Arboretum that are special to you. Share them with your family and friends. And keep an eye out for new special places that are waiting to be found. *

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is used as filling for pillows and comforters because it is hypoallergenic and inexpensive compared to down. Some people have tried promoting milkweed fibres as a substitute for less sustainable fibres for the textile industry.

The Coast Guard has also used milkweed fibres to clean up oil spills. Even though milkweed is often considered a harmful weed, its fibres have the unique ability to repel water. Even when soaked in water and oil, milkweed fibres will only absorb the oil. Milkweed coma can absorb four times more oil than polypropylene, the synthetic product most often used in oil spills. The less material needed to absorb oil the better, reducing the cost and duration of clean-up.

Other native milkweed species



Poke milkweed *Asclepias exaltata*

Poke milkweed is similar to common milkweed. When the two species grow close to each other they will often hybridize. The flowers are white, with sometimes a lavender tint. This tall species of milkweed can exceed 1.8 m in height and is often found growing along forest edges.

Butterfly weed *Asclepias tuberosa*

This species is often planted in gardens to attract various species of butterflies. It can be identified by its orange flowers (sometimes yellow or red) and alternate leaves.



Photo: Harold Stiver



Swamp milkweed *Asclepias incarnata*

As its name implies, swamp milkweed grows in wetlands



Ripe common milkweed pod with brown seeds, each with a tuft of white fibres called coma, which serves as a seed dispersal device.
Photo: Costas Tsirgiotis

or moist soil. The pink flowers, which sometimes smell like cinnamon, are arranged in flat umbels. Unlike most other milkweeds, swamp milkweed is self-fertilizing. This species is relatively easy to transplant because it does not have a long central taproot.

Species from Central America

Tropical milkweed

Asclepias curassavica

This non-native species is a popular garden variety because of its showy red, orange and yellow flowers and its ability to remain in bloom all summer. In addition, it is relatively easy to transplant and is deer and rabbit resistant.



Pollination of the milkweed flower

The pollination of milkweed flowers is a fascinating phenomena. When an insect lands on a flower, its leg slips into a slit. Inside the slit, the insect's leg will come in contact with sticky pollen sacs called pollinia. When the insect pulls its leg out of the slit, it brings the pollinia with it. Eventually, the insect will travel to another plant and its leg will slip into a slit again, transferring the pollen. If the pollinia is positioned in the right spot within the flower structure, fertilization is likely to occur.



Close-up of a milkweed flower

As you can see, the pollination of milkweed is a very precise process, which takes place in a flower with an intricate architecture. Therefore, the probability of



Left The black dot is the sticky part of the intact pollinia, waiting for a pollinator to insert its leg through the groove in the flower. **Centre** The pollinia has been extracted. **Right** A pollinia attached to the receptive female organ leading to the ovary. *Photo: Robert Klips Lab*

The hackberry tree and its emperor

By **Valentina Pieters**, Student Intern from Vanier College

The hackberry emperor *Asterocampa celtis*

The hackberry emperor, like the monarch and many other butterfly species, relies on a single host plant to feed its larvae. It is a rare species, with its range limited to where hackberry grows. The caterpillar is bright green with yellow stripes and patterns. Its genus is *Asterocampa*, which means “star caterpillar,” alluding to the star-like ‘antlers’ in the larval stage. Its species name is *celtis*, which is the genus of the hackberry tree.



Caterpillar with star-like ‘antlers’

Here is the story of our encounter with the emperor: One summer day, a man dropped by the Arboretum office to let us know that, every time he walked by a particular area, he had close encounters with a butterfly he had never seen before. Naturalist Chris Cloutier went with him to check it out and, sure enough, within a minute, a butterfly landed on him. This was in the field by the parking lot, near the young hackberry tree plantation. As expected, Chris identified the seemingly gregarious critter as the hackberry emperor. We had heard of it before since it had been observed around the edge of the Bobolink field by a



Emperor eggs on the under-side of hackberry leaves, by Chris Cloutier

former entomology student, Maxim Larrivée. We knew there were large hackberry trees along the lane west of the field and that was where he found the tree’s winged counterpart, which flew vigorously towards him, landing on him. This kind of behavior towards people is interpreted by some entomologists as the butterfly defending its territory, possibly because the butterfly behaves in a similarly offensive way towards other butterflies of its own and other species. If you want to observe a hackberry emperor, look for them in this location in summer. The butterfly activity peaks in mid-June, but extends into July and August.

The hackberry tree *Celtis occidentalis*

This native tree is a member of the elm family and is often found growing wild on Montreal Island. It can be identified by its distinctive corrugated bark and simple alternate leaves with asymmetrical bases. This tree can grow to a height of 15 meters and live for 150 years. It has become a popular replacement for other elms because it is immune to Dutch-elm disease. It is a hardy tree that is resistant to urban pollution and grows in a variety of soils. It is also moderately shade tolerant. The fruit is cherry-like and edible. It persists on the tree late into the winter months and attracts many species of birds such as cedar waxwings, northern cardinals and American robins.

Three good reasons to grow a hackberry tree in your yard:

- 1) It is an obligate host to the hackberry emperor butterfly.
- 2) Its fruit sustains local wildlife and is also edible.
- 3) It is a very hardy tree that is non-invasive and well suited to our environment. Few other species can be grown as easily.



The corrugated bark of the hackberry tree



Low-angle shot of the hackberry emperor butterfly, by Chris Cloutier

2 m tall bare-root saplings will be sold during our tree sale on the afternoon of Sunday, April 30. Order your tree by email at least one week in advance.

The birds overwintering at the Arboretum are fed by:



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successful pollination is low: in a large umbel of flowers, very few will be fertilized. However, the pollinia contains a large number of pollen grains and the

ovary in each flower bears dozens of ovules ready to be fertilized. Hence, even though only small numbers of flowers will be pollinated, each fertilized flower will grow into a

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A pollinia, composed of a dark adhesive gland connected to two articulated arms, each holding a waxy mass of pollen grains.
Photo: Dwight Kuhn

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