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Iris

The Alberta Native Plant Council Newsletter



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on the ANPC's website.
anpc.ab.ca



Cover photo: Marsha Hayward
Butterflies and flies on leafy arnica (*Arnica chamissonis*)
at Seibert Lake, Alberta.

Pollinator Profile

Lincoln Best

Bee Species: *Macropis nuda* (Provancher, 1882) (Melittidae)

Plant Species: *Lysimachia ciliata* L., fringed yellow loosestrife (Primulaceae)

Relationship: Bee is a narrowly oligolectic forager on this plant
and an important pollinator of it.

This profile presents the bee *Macropis nuda*, a small black bee originally described by Leon Provancher, a Catholic priest and Canadian naturalist who published early volumes on the Canadian flora and entomological fauna. This little black bee and its floral host have a nearly transcontinental distribution in Canada from the southern interior of British Columbia to the east coast. Here we focus more regionally on western Canada where the host plant is broadly distributed along tributaries and among adjacent wetland features of the North and South Saskatchewan Rivers in Alberta, and in riparian habitats of the Columbia and Fraser River watersheds in BC (see map, Fig. 1). The bee, likewise, is found commonly where its host plant occurs in the prairies and foothills of southern and central Alberta, and low elevation wetland habitats in southern British Columbia.

Our bee *Macropis nuda* belongs to the family Melittidae, a family of short-tongued bees. Solitary females

excavate tunnels and line them with oils collected from their host plant. They provision a firm, moistened pollen mass in typically humid soils often subjected to spring flooding, and their larvae consume the provision and spin a cocoon. They fly starting around the solstice and persist well into August where degree days accumulate more slowly for their host plant. Females (Fig. 2) can be distinguished from most other genera in our area by the single subantennal suture, the lack of facial fovea, and combination of scopal hairs on the hind tibia and hind basitarsus. The male (Fig. 3) has a yellow clypeus, and western individuals often have some additional yellow in the adjacent paraocular area.

The truly fascinating part of this bee-plant relationship is the unusual floral reward the plant provides to the bee. Some *Lysimachia* species including our *L. ciliata* (Fig. 4), have special glands

See **Pollinator Profile**, page 2

Pollinator Profile, from page 1

called elaiophores that secrete an alternative to nectar, floral oils. These oils are dense stores of energy, and water repellent, perfect for bees which live in wetland habitats where simple sugars would be quickly consumed by competing molds. *Macropis* females are specially adapted to forage for pollen and oils from *Lysimachia*. In Figure 5 we can see a female bee engaged in a complex routine, harvesting the floral oils with her front and midlegs, while she rakes the pollen from the anthers using the inside of her hindlegs. She does all of this while suspended upside down from the flower. This is the perfect position, however, as she catches the falling pollen in the long hairs on her abdomen and then mixes it with the floral oils before she packs it into the scopal hairs (pollen baskets) of her hindlegs. You can see this moistened pollen on her hindleg in Figure 5. It looks more honey-coloured than the loose dry pollen around her abdomen. This relationship is described in detail in a wonderful paper by Jim Cane and others (1983), which can be found online as a publicly available pdf document.

Propagation of this perennial herb from seed and cuttings is easy without advanced techniques, and showy commercial cultivars are available but should be avoided. Cuttings can be planted in spring and fall, and seeds naturally disperse during flooding so require light for germination and should be sown directly on the surface. *Lysimachia ciliata* would be a wise companion to *Salix* staking in

watersheds where *Macropis nuda* is known to occur. Conservation strategies are straightforward: 1) Conserve habitats where the host plant is known to occur, 2) Re-establish populations of these plants where they've been lost, and 3) Support your local native plant nursery.

Lincoln R. Best is a native bee taxonomist. He works on a broad spectrum of research in western North America with Oregon State University and the University of Calgary. He works to engage the public in conservation and scientific outreach as a director for the Native Bee Society of BC and Bee City Canada. You can follow him on social media @beesofcanada.

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Map Data

The credits for GBIF and pnwherbaria are for the data points for the plant species that are displayed on the map. The map was made using QGIS and is open source.

pnwherbaria.org (10 September 2020)
BC-*Lysimachia ciliata* occurrence csv text file download.
pnwherbaria.org (10 September 2020)
AB-*Lysimachia ciliata* occurrence csv text file download.

GBIF.org (10 September 2020) GBIF Occurrence Download <https://doi.org/10.15468/dl.jdk542>.

GBIF.org (10 September 2020) GBIF Occurrence Download <https://doi.org/10.15468/dl.fjbp2d>.

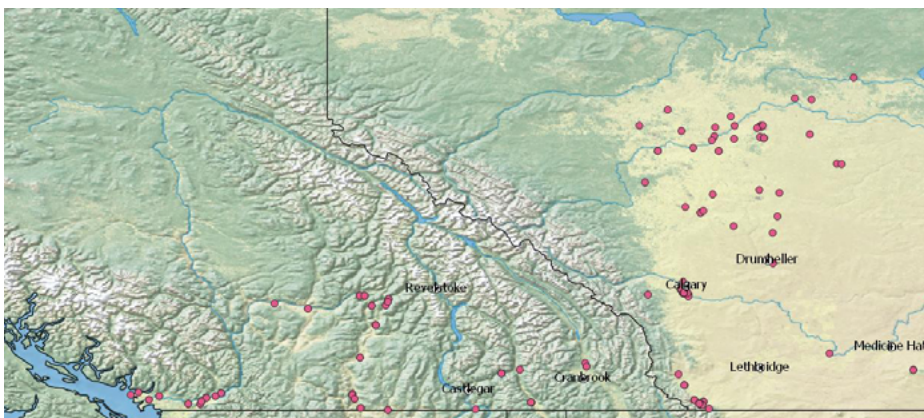


Figure 1. Western distribution of the floral host, *Lysimachia ciliata*, in Canada.



Figure 2. *Macropis nuda* female



Figure 3. *Macropis nuda* male visiting *Lysimachia ciliata*



Figure 4. *Lysimachia ciliata*, fringed yellow loosestrife, speckled with floral oils



Figure 5. *Macropis nuda* female collecting pollen from the anthers, and floral oils secreted by the elaiophores ♦



Save the Date!
March 20, 2021

Marsha Hayward

Please join us on Saturday March 20, 2021, for our annual workshop — **Northern Native Plants and Ecosystems**. This will be a virtual workshop with presentations delivered by webinar.

Check our website (anpc.ab.ca) for further information and registration details. Become a member and receive information emails including updates regarding our workshop and other news about the Alberta Native Plant Council.

We hope to connect with you in March! ♦

An Update on the “Optimizing Alberta Parks” Plan

In March 2020, the Government of Alberta announced a plan to remove 175 parks from the Alberta parks system. On December 22, 2020, Minister Nixon announced that no sites under the Budget 2020 optimization plan would be delisted, and all sites would retain their current designations and associated protections ([Alberta Government](#), 2020).

The ANPC Society Board encourages its members to continue to learn more about:

- The Government of Alberta’s plan: [Optimizing Alberta Parks](#)
- The list of sites in the Alberta parks system for which the Government of Alberta has secured or maintained partnerships across the province: [Alberta Parks Partnership List](#)
- Alberta’s Plan for Parks: [Plan for Parks](#)

The ANPC Society Board thanks all its members who took action to defend Alberta Parks. Your dedication to conserving and protecting our valuable parks and natural areas is greatly appreciated! ♦

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Oh, Those Crazy Yellow Locoweeds

Lorna Allen

There are nine types of locoweed (genus *Oxytropis*) in Alberta, and their flowers come in two colours — yellow (to whiteish) or purple. The yellow locoweeds seem to be the most difficult to identify beyond "*Oxytropis* sp." Here, they come in three types — I think that is agreed upon. But then, it gets complicated. In the Flora of Alberta (Moss 1983), they are treated as separate species, as follows:

alpine locoweed – *Oxytropis cusickii*
 early yellow locoweed – *Oxytropis sericea*
 late yellow locoweed – *Oxytropis monticola*

In some other references, all three are treated as subspecies or varieties of *Oxytropis campestris*, which increases confusion if plants were just identified to species. So, identifying the locoweed you are looking at will depend on which reference you are using (and how old it is).

Following VASCAN (Brouillet et al. 2010+) (which is following the Flora of North America draft treatment), alpine locoweed and late yellow locoweed are now (again) treated as varieties of *Oxytropis campestris*. Confusingly, one of the purple locoweeds is also now treated as a variety of *O. campestris*. Here is the current treatment of our three yellow locoweeds:

alpine locoweed – *O. campestris* var. *cusickii*
 early yellow locoweed – *O. sericea*
 late yellow locoweed – *O. campestris* var. *spicata*

The changing taxonomy is a bit of a hint that these can be difficult to separate out, but the location of the plant might be a clue. All three can be found in the mountains, but alpine locoweed is generally only found in the alpine to upper subalpine. The other two are usually only found at lower elevation, with ranges that extend

into the grassland. Always check the characteristics (because surprises can happen), but generally alpine locoweed won't be found outside the alpine/subalpine.

Next, look at blooming time — if it's May and you have a blooming yellow *Oxytropis*, it is probably early yellow locoweed. If there are leathery, firm pods (often left over from previous years), that is added confirmation. The other two have pods that are thin and papery at maturity. Moving into June, the other locoweeds, in addition to early yellow locoweed, could be blooming, so time to look at other, trickier distinguishing characteristics.

The Flora of North America draft for the *Oxytropis* is not yet available, but once it is, perhaps there will be other changes or clearer information on

See **Crazy Yellow Locoweeds**, page 5

Alpine locoweed (*O. campestris* var. *cusickii*)



Lorna Allen



Lorna Allen

A short plant (3 cm to 15 cm tall) often found in dry alpine tundra.



Lorna Allen



Lorna Allen

Few flowers per cluster (3 to 15) and few leaflets* per leaf (7 to 17).
 The calyx** has dark and white hairs.

* *Oxytropis* have compound leaves, with one leaf consisting of numerous small leaflets.

** The calyx is the outer ring of the flower; in *Oxytropis* the calyx has 5 teeth and fused sepals.

Early yellow locoweed (*O. sericia*)

Lorna Allen



Lorna Allen

More flowers per cluster (6 to 27) than alpine locoweed.
The calyx has silky dark and white hairs.



Lorna Allen



Lorna Allen

Usually taller (7 cm to 30 cm tall) than alpine locoweed.

Pods are leathery and often persistent.

Few leaflets per leaf (7 to 21) and gray or silvery long-hairy.



Lorna Allen

distinguishing characteristics, but meanwhile, here is a series of photos highlighting the characteristics that I think are the most useful, based on Kershaw and Allen (2020). Lesica (2012), however, helpfully points out “it may not always be possible to distinguish [alpine locoweed] from high elevation forms of [early yellow locoweed].” So, . . . good luck.

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Late yellow locoweed (*O. campestris* var. *spicata*)

Lorna Allen

Similar in height to early yellow locoweed (5 cm to 40 cm tall) but usually taller than alpine locoweed.

Similar number of flowers/cluster to early yellow locoweed, (6 to 27), more than alpine locoweed.



Lorna Allen

More leaflets per leaf (17 to 33) than either alpine locoweed or early yellow locoweed.



Lorna Allen

Late yellow locoweed has flower bracts (arrow) with soft, spreading hairs on the outer surface.

Leaflets usually sparsely hairy (but this is variable).



Lorna Allen

An Introduction to Gall-Forming Insects

C. Dana Bush

Oh, the life of a gall insect, surrounded by food and shelter, like being in a womb of another species. But all is not safe in paradise: galls and their gallers are tasty bits for birds, mammals and other insects.

Although galls are plant structures, they are not formed by the plant – the insects are in control. The gallers manipulate the growth and physiology of the host plant to provide the larvae with food and protection. The food is highly nutritious tissue not normally found in the host plant, and protective structures include hard cases, hairy or spiny surfaces, resinous or oily surfaces, internal air gaps, decoy chambers, and honeydew, which is defended by ants, as well as high tannin concentrations in the outside tissue (Cornell 1983, Shorthouse 2010, Wong et al. 1997). Most gallers are parasites, but some fig wasps and yucca moths are mutualistic, pollinating the figs and yucca plants as well as consuming the seeds.

There are more than 13,000 species of galling insects, in seven orders, as well as fungi, and bacteria such as *Frankia* and *Rhizobium* species, which make nitrogen-fixing nodules in the roots. The most complex structures are induced by gall midges (Diptera: Cecidomyiidae), and gall wasps (Hymenoptera, Cynipidae) (Stone & Schonrogge 2003).

Gall midges (Cecidomyiidae or Itonididae) are tiny flies with brightly coloured larvae (Encyclopaedia Britannica 2010) and are the largest group of galling insects. They form galls in many families, such as willows, roses, legumes, grapes and composites (goldenrods and asters). In Alberta, they form small balls on aspen leaves, spindle-shaped galls on the stems of fireweed, elongate swellings near the



base of needles on balsam fir, pine cone-like structures on willows, and purselike galls on the underside of saskatoon leaves (Wong et al. 1997).

Gall mites or plant mites (Eriophyidae) cause small oval blisters with hairy undersides on oak leaves, pale yellowish fur on the upper sides of hazelnut leaves, small spindle-shaped structures on chokecherry leaves, and form pink nipple-like galls on the upper sides of saskatoon leaves. The poplar bud gall mite makes hard knobby galls on aspen buds (Wong et al. 1997).

The long-horned beetle makes a spindle-shaped gall on the stem of poplars, while the poplar borer forms a gall at the junction of stem and root of trembling aspen. The willow redgall sawfly makes bean-shaped galls on willow leaves. Even aphids make galls on poplar leaves, petioles and stems, and an aphid-like insect called the spruce gall adelgid is responsible for the hard cone-like galls on the tips of spruce trees (Wong et al. 1997).

Cynipids or gall wasps, are the second-largest group of gall insects. They are small (1-4 mm), reddish-brown to black, rather nondescript wasps, with white legless larvae. Although there are more than 1,400 species, they only invade 11 plant genera – mostly roses and oak, and almost all are dicots (one gall wasp on *Smilax* is the exception). Each species of cynipid induces distinct, anatomically complex galls with up to five layers of tissues that bear little resemblance to the plant tissues from which they are derived. They make some of the most interesting structures, from simple stem swellings on raspberries (with or without spines), to bizarre hairy or spiny structures on rose leaves and stems. The round balls on the stems of skeleton weed is caused by a gall wasp. (Shorthouse 2010, Wong et al. 1997).

Although galls successfully supply food to the larvae and protect them from the elements, they are not as successful at protecting them from parasites and predators. Individual gall wasp larvae are attacked by anywhere from 5 to 20 inquiline and parasitoid species, and 20%-99% of hosts at a given site can be attacked (Cornell 1983). Inquilines are gall wasps that feed on the gall tissues inside the galls of other cynipids – they do not initiate gall development, but they can modify the host gall (Ronquist, Fredrik & Liljeblad 2001, Felt 1918). Not only are gallers attacked by

See **Gall-Forming Insects**, page 7

Gall-Forming Insects, from page 6

other insects, but birds and mammals are attracted to them, leading to an interesting dynamic between the need to evolve large hard structures to protect them from insects, and smaller less-attractive structures to avoid being eaten by vertebrates (László et al. 2014).

Consider the gall insect; it does not sow, yet it reaps; it does not build, yet it is sheltered; it gives nothing and receives abundantly (E. P. Felt 1918).

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Wildflowers of Whitehorse Wildland Provincial Park

by Alison Dinwoodie, Dorothy Fabijan, Carole Dodd and Kristen Andersen

The Whitehorse Wildland Provincial Park is an amazing region in the west central foothills of Alberta. Encompassing subalpine and alpine ecosystems, it is one of the few places where you can drive directly up to an alpine meadow.

Coal mining opened up this area in the early 1900s with the railway connecting the mines of Luscar, Sterco, Mountain Park and Cadomin (to name a few) with the main railway running from Edmonton west to the coast. Over time the old mines closed, areas were being reclaimed, and then new mines were opened.

In the late 1900s, as environmental lead of the Edmonton chapter of the Alpine Club of Canada, Alison Dinwoodie wanted to direct how this land could be saved for future generations. In 1998, the area became the Whitehorse Wildland Provincial Park. Alison worked tirelessly with mine personnel, and ANPC became a steward for the area. Conservation versus off-highway vehicle use was always a challenge.

Realizing the need for a publication to show the value of this area, Alison wanted to tell the story of the diversity of native plants occurring there. Although many of these plants occur further south, a number of them have special characteristics that make them unique to the area.

This full colour, 138-page field guide documents more than 150 species of flowers, and also includes trees, shrubs, grasses, and ferns and fern allies. A general description of each species includes size, leaf and flower characteristics as well as growth form and habitat. Colour photos show the full size of each plant and feature close-up pictures to confirm identification. For some families, leaf drawings help distinguish among members. Each species is identified by a common and scientific name, and thumbnail photos enable easy initial identification by colour. Thanks to enthusiastic local botanists, these photos are a visual record of the abundant species of this sensitive area.

ANPC kindly supported the publication of this field guide. This slim book is easy to carry in the field and may be purchased for \$20.00 through the ANPC website: https://anpc.ab.ca/?page_id=823 ♦

2021 Plant Study Group Winter Webinar Series

Thursdays at 12:00 noon

- **January 14** – David Evans, ABMI
- **January 28** – Melanie Bird and Ryan James
- **February 11 & 25** – Steven Tannas, Tannas Conservation Services
- **March 11** – Latifa Ahmed-Pelletier, ALCLA Native Plant Nursery
- **March 25** – Brittney Miller and Diana Tirlea

With an average attendance of 80 people per event, we sincerely thank everyone who attended our Fall Plant Study Group Webinar Series. We were able to connect with more than 300 registrants over the course of these events and are pleased to see people continuing to watch the video recordings. Based on our survey data, our audience consisted of botanists, environmental consultants, government employees, researchers, students, hobby naturalists and gardeners. We also had people tune in from across the province, and it is so great to see that we have been able to connect with people who might not have an in-person study group available in their region (here's looking at you, Lethbridge — we heard some interest in a potential study group starting in this location!)

As ANPC members, you can view the plant study group webinar recordings by contacting outreach@anpc.ab.ca. Please also feel free to reach out if you have suggestions, ideas or interest in volunteering for future events (plant study groups, workshop, field trips, etc.).

We are pleased to announce that Plant Study Group Webinars will continue through the winter months. You can find more information about webinar topics on the [ANPC website](#).

Please register here for the winter webinar series. ♦

Rare Plant Profile — Limber Pine, *Pinus flexilis*

Laurie Hamilton and Coleen Mahoney

Have you heard of the Burmis Tree (Figure 1)? It was a limber pine tree located in the Crowsnest Pass, and it may have been the most photographed tree in Alberta ([Alberta Historic Places](#), 2012). The Burmis Tree was almost 700 years old when it died in the 1970s.

Limber pine (*Pinus flexilis*) is a slow-growing five-needled coniferous tree that occurs on dry ridgetops. Often limber pine trees are up to 1,000 years old and do not grow very tall due to environmental conditions.

Limber pine is a keystone species, and it is listed as Endangered in the *Alberta Wildlife Act Regulations* due to a decline in the population caused by white pine blister rust (*Cronartium ribicola*) and mountain pine beetle (*Dendroctonus ponderosae*) ([Alberta Government](#), 2020). Limber pine play an important role in their ecosystems including creating locally moist conditions and providing a rich source of food for birds and mammals, not to mention the scenic beauty they provide. ♦



Limber pine tree



Figure 1. The Burmis Tree in southwest Alberta

Source: Alberta Historic Places, 2012



Active cankers of white pine blister rust on a limber pine stem



Limber pine cones and needles

Iris is published three times a year by ANPC. The Council aims to increase knowledge of Alberta's wild flora and to preserve this diverse resource for the enjoyment of present and future generations.

If you have an announcement, article or other item, you are invited to submit it to the editor for publication. Items concerning native plants will be given highest priority.

The editors reserve the right to edit submissions, but will review changes with the authors whenever possible. Disputes will be resolved in favour of the audience.

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Submission deadline for the next issue:
January 1, 2021

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