

The pollinators of cloudberry

A summer of fieldwork for Niminima: Ekuanitshit's Berry Project

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The land

My summer fieldwork took place in Nitassinan (Eastern Quebec and Labrador). Nitassinan means “our land” in Innu-aimun and multiple Innu communities inhabit this land. I worked closely with the women from Ekuanitshit who design and lead the Niminima (The Berry Project). Ekuanitshit anchors this project, but its research involves the other three communities of Mamit Innuat: Nutashkuan, Pakuashipi and Unamen Shipu.



Map displaying the communities participating in Niminima.

© Conseil tribal Mamit Innuat (2011).

Niminima

Berry picking nourishes the physiological, spiritual and cultural health of many Innu peoples. Blueberry, lingonberry and cloudberry all grow in Nitassinan and have become the focus of Niminima/The Berry Project. More specifically, Niminima investigates whether climate change contributes to the ever-decreasing harvest yield of blueberry, lingonberry and cloudberry.

Multiple variables (snow levels, temperature, and flowering time, for example) have been quantitatively studied to glean information on the berry yields. Dr. Catherine Potvin has consulted with Niminima for many years and offered that I participate in the project by studying the pollinators of cloudberry (*Rubus chamaemorus*).



Cloudberry fruit.

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Why care about the pollinators ?

Cloudberry is dioecious: the male and female flowers exist on separate plants. While cloudberry reproduces via rhizomes primarily, pollination and subsequent fertilization of the ovule precedes fruit production. That is, for the berry to be made, pollen must be transported from a male flower to the reproductive parts of the female flower.

Bugs, bug nets, and bogs

I visited Nitassinan for five weeks from mid-May to mid-June 2023. During my stay, I spent most days in the field. I entered cloudberry's habitat, ombrotrophic bogs, where I swung a bug net to catch specimens present before and during the plant's flowering. Thankfully, I arrived in Ekuanitshit before cloudberry was in flower; Niminima missed the flowering in previous springs. Each individual cloudberry flower lasts five days and the flowering period lasts two to three weeks total. Further, the flowering period begins anytime from early May until mid-June. We decided that I would leave for Ekuanitshit in mid-May to assure that I would be there for the first days of flowering. We planned to observe and collect insects present in the bogs before, during, and after the flowering period.

Unfortunately, I had to leave Ekuanitshit during the last few days of cloudberry's flowering because of the expensive lodging in the region and because I was to participate in the Indigenous Mentorship and Paid Research Experience (IMPRESS) Program for the remainder of my summer's research. Despite my leaving early, we still collected/observed close to 350 individual insects. The SEEF grant made it possible for me to stay in Ekuanitshit for five whole weeks in the first place. Many thanks.



Female cloudberry flower.



Male cloudberry flower.



Cloudberry flowers in an ombrotrophic bog.

Who are the pollinators ?

Flies dominate the pollinator guild of cloudberry. Cloudberry flowers between May and June and flies (Diptera) become abundant earlier in the spring than bees and bumble bees (Hymenoptera). Further, flies stay on cloudberry flowers for much longer than bumble bees¹. Thus, flies pollinate cloudberry more effectively than bees and bumble bees². This detail was great to learn, as we often celebrate the pollinating power of bees and bumble bees, but flies often become forgotten.

In fact, our results from this summer's fieldwork closely resemble other studies of the pollinators of cloudberry, one of which took place two decades ago in the same location³. The pollinator guild of cloudberry remains as abundant, diverse, and overwhelmingly flies ! For example, four families of flies and bees/bumble bees comprised 84.9% of cloudberry's pollinator guild this summer. These families are Syrphidae, Muscidae, Halictidae, and Apidae. Brown and McNeil (2009) found these families to comprise 83.7% of cloudberry's pollinator guild in 2000. Therefore, in presenting the results from this summer's fieldwork, I cannot infer that climate change has decreased the populations of the pollinators of cloudberry. Whether climate change has temporally shifted the pollinators with respect to cloudberry's flowering time, however, would require that additional data be collected.

¹ Video available on YouTube : <https://www.youtube.com/watch?v=gpmt-PrFXE4>

² Brown, Adam O, and Jeremy N McNeil. "Pollination Ecology of the High Latitude, Dioecious Cloudberry (*Rubus chamaemorus*; Rosaceae)." *American Journal of Botany* 96, no. 6 (2009): 1096–1107. <https://doi.org/10.3732/ajb.0800102>.

³ Brown, Adam O, and Jeremy N McNeil. "Pollination Ecology of the High Latitude, Dioecious Cloudberry (*Rubus chamaemorus*; Rosaceae)." *American Journal of Botany* 96, no. 6 (2009): 1096–1107. <https://doi.org/10.3732/ajb.0800102>.



A syrphid fly (*Cheilosia* sp.) on a cloudberry flower.

Insect collection

Beyond calculating the abundance and efficiency of cloudberry's pollinators, I was also tasked with mounting and identifying the insects that we collected in the field. While I successfully settled into the rhythm and techniques of pinning insects, the identification continues to trouble me. Thankfully, many entomologists offered their guidance and expertise: notably Dr. Hector Barrios and Étienne Normandin.



Syrphid fly (*Eristalis dimidiata*) mounted L'institut de recherche en biologie végétale (IRBV) in Montreal.



Syrphid fly (*Chalcosyrphus* sp.) mounted at L'institut de recherche en biologie végétale (IRBV) in Montreal.

Discussing the results

The SEEF grant funded my return trip to Ekuanitshit in August of 2023. I find this return trip paramount: it shows respect to those who lead and participate in the project, as well as Niminima at large. Additionally, personally returning the results was the securest way to transport pinned insects over a long distance. Oh what delicate specimens !

In-person, we shared spirit and boosted morale while debriefing on the summer's work. Accordingly, my final presentation on the pollinators of cloudberry became more of a discussion than something formal—a more comfortable meeting environment. I also met the participants who collected insect specimens in Pakuashipi and Unamen Shipu. While I visited Nitassinan in May and June, I stayed close to Ekuanitshit to focus on data collection. This in-person format enabled me to learn about other participants, their connection to cloudberry, and their desires for this project. It was wonderful to linger in others' stories.

Not only did we debrief, but we collectively imagined other potential impacts on berry yields and future directions for Niminima. For example, I was excited to discuss how harvesting habits might harm cloudberry crops. Thus, the conversation remains continuous with questions of climate change, but also considers factors beyond.

The SEEF grant funded some of my initial fieldwork trip, but mostly, it funded my trip to return the results to Ekuanitshit in-person. Therefore, this grant supports my fostering respect and maintaining relations with members of Ekuanitshit, Unamen Shipu and Pakuashipi. These sorts of relations work against the justified tropes of extractive biologists: those who collect data and resources, and never return/never give back to the land. Coworker relations that expand beyond biological data become crucial in moving science towards a more respectful, inclusive, and accessible future. Thank you so much for funding my ethical investment in community-led science initiatives.



Looking at pinned insects in Ekuanitshit.



Looking at posters of insects we collected this summer.

DE MASSEKU
PATAMI,
EKUANITSHIT

COLLECTÉE
LE 11 JUIN
2023

PAR MARIE-
LISE
MESTOKOSHO

Voilà:



ÉRISTALE

UNE MOUCHE À FLEUR

ET UNE POLLINISATRICE IMPORTANTE DE SHIKUTEU/LA CHICOUTÉE

DE UINIPEKU,
UNAMEN
SHIPU

COLLECTÉ LE 6
JUN 2023

PAR
KATHLEEN
MARK

LE MAGNIFIQUE COLLEMBOLÉ

UN INSECTE SANS AILES



PAS VRAIMENT UN POLLINISATEUR DE
SHIKUTEU/LA CHICOUTÉE

DE MASSEKU,
PAKUASHIPI

COLLECTÉE LE 13
JUN 2023

PAR DIANE LALO,
REBECCA LALO
BELLEFLEUR ET
CORALIE GAUTIER



LA MOUCHE VERTE

UNE POLLINISATRICE DE
SHIKUTEU/LA CHICOUTÉE