

Cultivation of the Indian Cucumber-Root (*Medeola virginiana* L.)
in the understory of a sugarbush

Foreword

Through a program called “Improvement and Development of Sugar Bush Resources”, professional foresters and researchers of the Faculty of forestry (*Université de Moncton, Campus d’Edmundston*) conducted tests on Indian Cucumber-Root, an indigenous species found in rich soil habitat including sugar maple stands. This technical guide aims to explain the method enabling the cultivation of Indian Cucumber in the understory of a sugarbush.

Why Cultivate Indian Cucumber-Root?

Edible rhizome:

- Crisp like the radish or the cucumber;
- Exquisite taste;
- Can be eaten raw in a salad;
- Can be eaten cooked, like potatoes;
- Can be marinated in vinegar.

Medicinal properties of the rhizome:

- Used as an anti-convulsion by the First Nations;
- Used as a diuretic (stimulates kidneys functions).



Rizhome of an Indian Cucumber

Rhizome:

Bulbous underground stem on to which root system and above ground stem are attached.

Issues associated with the Indian Cucumber-Root

The Indian Cucumber-root is very vulnerable to harvesting since its propagation is difficult (Lamoureux et Nantel 1999). Therefore, it is important to:

- Be extremely careful during the exploitation the Indian Cucumber in order to protect the resource;
- Avoid harvesting rhizomes in wild populations;
- Establish an Indian Cucumber-root cultivation in the understory of the sugarbush.

****Another important issue with the Indian Cucumber-root is that market needs to be developed.****

To better understand the Indian Cucumber-Root...

How to Identify the Indian Cucumber-Root

Latin name: *Medeola virginiana* L.

Common name: Indian Cucumber-Root

Stem: Single stem 30 to 90 cm long, covered with hair when young and dissipates with time.

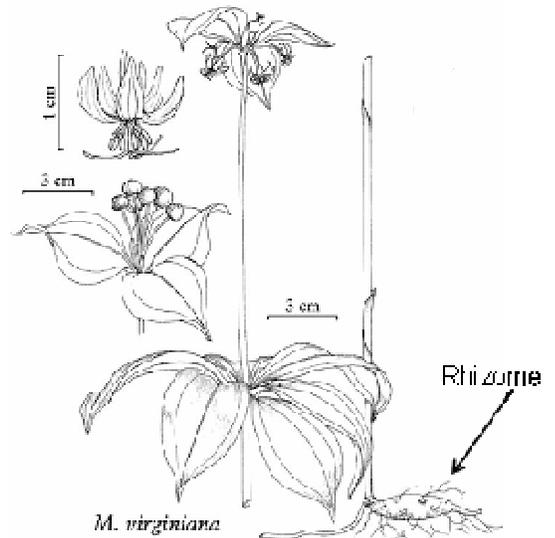
Leaves: Single leaves with smooth edge in one or two verticil of 5 to 9 leaves.

Flower: On the upper verticil, 3 to 9, yellow, small, hanging down.

Fruits: Upright, small dark red berry, upright.

Rhizome: 2 to 7 cm long, situated at 1 to 4 cm deep in the soil, white in coloration, smells like cucumber.

Habitats: Sugar maple stands, mixed forests, deep rich soils.



Adapté de <http://www.elloras.org/>



Understanding Indian Cucumber-Root Propagation

****To increase awareness of the plant fragility to harvesting****

- Harvesting the Indian Cucumber-Root rhizome for consumption is in itself a destructive method (it kills the plant).
- Plant propagation is not easily achieved through seed dispersal.
- The Indian Cucumber-Root propagates mostly through vegetative means by creating clones through its rhizome.

Explanation:

- During spring, a stem appears and grows from the main rhizome.
- This stem grows and becomes its own rhizome.
- It will grow in diameter and length throughout the summer. Bigger is the main rhizome, bigger secondary rhizomes will be.
- Depending on the plant and site conditions, 1 to 3 secondary rhizomes will grow throughout the summer.
- Secondary rhizomes do not have aboveground stems.
- During fall, the plant dies and the main rhizome decomposes.
- The following year, all secondary rhizomes that were produced become main rhizomes and will produce secondary rhizomes.

To summarize:

****Given the propagation method of the Indian Cucumber-Root, it is necessary to harvest only the main rhizome during fall before it decomposes but after secondary rhizomes and aboveground stem have developed. Rhizomes develop their unique taste only during fall. Earlier in the season, rhizomes have a starchy taste.****



How do I cultivate Indian Cucumber-Root?

****As it was mentioned previously, in order to have a sustainable harvest, it is important to avoid harvesting wild Indian Cucumber-Root.****

1 - Determine a favourable site to establish an Indian Cucumber-Root cultivation:

- Indian Cucumber-Root needs **rich soil** for it to establish itself.
- Choose a site with mature sugar maple/yellow birch stands or sugar maple/american beech stands or a mixed stand.

2 - Prepare the soil and the site:

- **Remove competing plants** (herbaceous vegetation in the understory).
- It is preferable to **scarify the soil** in order to remove roots and aerate the soil. This can be done using a garden tiller or by hand with gardening tools. Try to minimize maple roots damage.
- It might be advisable to **create mounds of soil of different sizes** which can be used to transplant the Indian Cucumber Roots. The mound creates a better micro site with better drainage and a higher temperature. These conditions will increase the amount of secondary rhizomes produced by the main rhizome. The size of the mounds depends on the space available and practicality for the producer.

3 - Select and collect the Indian Cucumber-Root that will be part of the cultivation:

- For the time being, there are no seeds or plants available for plantation purposes. Some specimens are sold for ornamental purposes, but they are very expensive (7 to 10\$ per plant).
- It is therefore possible to collect a limited number of wild Indian Cucumber-Root to transplant them in your cultivation.
- It is the **ONLY** harvesting that should be done from the wild population, in order to establish the plantation.

When?

- **September**
 - Avoid collecting Indian Cucumber-Root in spring: they are very fragile during this time and the risk of damage is quite high.

How?

- Locate an area where there is a large healthy population of Indian Cucumber-Root.
- Select plants with the most rugged stem and that have fruits: this will ensure they have good size rhizomes.
- Limit harvesting at 30% maximum of the original population spread over the area.
- **Only collect the bigger secondary rhizomes:** To do this, find an Indian Cucumber-Root stem and dig up the base of the plant. Find the main rhizome, which will deteriorate a little later, and follow the root to find the secondary rhizome that will be collected. Leave some of the secondary rhizomes on the site; they will continue to propagate the population for the following year.
- Dig up the soil with the rhizome: The soil around the rhizome contains symbiotic mushrooms that enhance the absorption of nutrients. It also avoids full exposure to the air during the transport.
- Quickly transport rhizomes to the site for transplantation.

4 - Transplant the Indian Cucumber-Root on the cultivation site:

- Plant rhizomes on the chosen site at a depth of 5 to 10 cm.
- Space the rhizomes at approximately 20 cm.

5 - Protection of the plants:

Some animals, like whitetail deer, hare and voles love the Indian Cucumber-root. These animals browse the stem or go directly for the rhizome and it can have a negative impact on the cultivation.

- It is therefore important to erect a physical barrier around the cultivation.
- **Suggestion:** A wooden cage with a screen can serve as a protection.

6 - Follow-up:

- Controlling competing vegetation can be done as needed.
- Very little maintenance is needed since it is an indigenous species perfectly adapted to our climate.



Note: Few insects or disease affects the Indian Cucumber-Root.

7 - Harvesting and transportation of the rhizomes:

When?

- Every year.
- End of August.
- At this time, the main rhizomes have transferred most of their reserves to the secondary rhizomes.
- The sustainability of the cultivation will be ensured by secondary rhizomes.

How?

- Dig up the main rhizome; the one directly connected to the above ground plant.
- Put rhizomes in a brown paper bag. Avoid plastic bags as they accelerate rotting.
- Refrigerate as fast as possible.
- Rhizomes are ready for processing or marketing.
- Wash rhizomes in cold water. It is also possible to peel the skin before eating it, but this is not necessary.

Preservation of the rhizomes

Refrigerate rhizomes in a *Ziploc* with soil from the maple stand to preserve them for a long period of time.



Economic potential and marketing

Costs associated with Indian Cucumber-Root cultivation are limited to the cost for labour and material to protect the established cultivation, if deemed necessary. However, there is presently no market for this edible plant. It is therefore necessary to verify if a market for the product can be established before undertaking the work to create the plantation. The detailed costs are for information purposes only. The salary for the labour is established at 25\$ an hour which includes travel.

Establishment of an Indian Cucumber-Root cultivation in the understory of a sugarbush

8 parcels of 4' by 8' (24 m²)

Costs for establishment of the cultivation

Labour

(2 people @25\$/h)	16h/person	800 \$
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Equipment

Manual tools (shovel, rake, garden tiller, axe, sledge hammer, drill, stapler, exacto knife)		0 \$
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Material to protect the cultivation (optional)

56 baulk (2" by 4") at 2\$ ea.		112 \$
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160 screws (2") at 0,10\$ ea.		16 \$
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48' of screen at 3,50\$ /feet		168 \$
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Total		<u>1 096 \$</u>
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Annual Costs

Maintenance

Weeding (1 person @ 25\$/h)	4h	100 \$
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Inspection(1person @ 25\$/h)	4h	100 \$
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Harvest

Harvesting of main rhizomes (1 person @ 25\$/h)	12h	<u>300 \$</u>
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Total		500 \$
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Production

1 rhizome of 2 to 7 cm in length per plant

Number of plants = 20 cm by 20 cm @ 24m ² = 600	600 rhizomes
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Revenue

No market exists at this point

Marketing

- Presently, there is no market for the Indian Cucumber-Root.
- The main challenge is to develop the market for the product without depleting the resource.

With its interesting culinary properties, it is possible to think that a local market for the Indian Cucumber-Root could be developed. The producer will need to invest time and effort to market the product. It is therefore important for the producer to network with local chefs, restaurants and local groceries stores among others to test the interests in the rhizome and verify if a market can be developed before investing in large scale production.

Aside from the marketing aspect of it, the Indian Cucumber-Root represents little risks. Most sugar maple producers would possess the material and space necessary for such a production. As mentioned in different occasions in this document, this plant is very vulnerable to harvest. This is why it is very important to domesticate the plant and harvest only what is produced from this operation.

Example of an establishment of Indian Cucumber-Root cultivation in the understory of a sugarbush

This table is a reminder of the tasks to be completed for the establishment of the Indian Cucumber-Root production. It is for information purposes only.

	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	
Planning									
Documentation									
Market research and networking									
Gather material									
Plantation installation									
Site preparation									
Plantation									
								> (begining of September)	
Maintenance									
Weeding (if necessary)									
Inspection									
Harvesting and marketing									
Harvesting of the rhizomes									
Manufacturing of the rhizomes(if needed)									
Marketing									
								> (begining of September)	

Additional information

This technical guide is presented by the Faculty of Forestry (*Faculté de foresterie de l'Université de Moncton - Campus d'Edmundston*) within the context of the "Improvement and Development of Sugar Bush Resources Program". The main objective of the program is to optimize the economic model of Sugar Bushes in New Brunswick by investing in development, research and technology transfer. More precisely, the program aims to meet the following objectives:

- Diversify production and find innovative new products for commercialization;
- Technology and knowledge transfer;
- Training and professionalization of the workforce.

Do not hesitate to ask professionals in the field for help and to share your experiences with us.

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Conferences and workshops are available at the *Montagne Verte* Sugar Bush. Moreover, more forestry extension materials in other aspects of the program are available for interested people. The other technical guides discuss topics such as the cultivation of American ginseng, beaked hazel, multi-resource inventory, mushrooms and organic fertilization in maple stands. Contact Jeff Levesques for more information.

You can also visit our web site at www.umce.ca/foresterie/érablière for more information.

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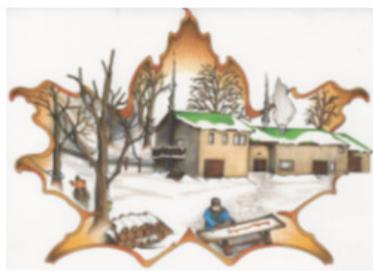
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Recipes...

Indian Cucumber-Root Rhizome Salade

6 medium sized boiled potatoes
1 cup of Indian Cucumber-Root rhizomes (sliced)
1 small onion (diced)
1 cup of celery (diced)
2 tablespoons of fresh parsley
Your choice of vinaigrette

Peel and cut potatoes while they are still hot. Add all ingredients and mix together. Lastly, add the vinaigrette. *Adapted from Medve et Medve 1990.

Marinated Rhizomes

1 cup of rhizomes of Indian Cucumber-Root (diced)
1 big Spanish onion (diced)
2 tablespoons of salt

Marinade:

1/4 cup of white vinegar	1 teaspoon of dill seed
1/4 cup of sugar	1/2 teaspoon of mustard seed
1 teaspoon of celery seed	1/2 teaspoon of turmeric

Mix the rhizomes with the onion and add the salt. Add enough water to cover and let sit for 30 minutes. Mix the marinade ingredients together. Drain the water from the rhizomes and the onion and add the marinade. Cook on medium to low until marinade is hot. Put the marinated rhizomes into mason jars and refrigerate.

*Adapted from Medve et Medve 1990.

Enjoy!