

What is Moderation? Labrador Tea Warnings and Ledol Content

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Summary: There are 3 different species of ‘Labrador tea’ found around the globe and each species has a different chemical composition. Ledol is the component of concern in Labrador tea. In the North American species less than 1% of the essential oil extract is ledol, while in the Eurasian species ledol can make up to 48.2% of the essential oil. Continue reading for more details.

As you may (or may not) have noticed, our Labrador tea products come with a warning against consumption by pregnant or breast feeding ladies. When I first learned this I was surprised since growing up I had never heard anything about Labrador tea being toxic. Light Googling revealed various blogs recommending caution and moderation when consuming. This raised a lot of questions for me. Is it true? How much is moderate? What happens if I have “too much”? How cautious do I need to be? How come in my experience Labrador tea is one of the most popular bush teas but I have never heard a warning before? Experience was not matching up with what I was reading. So, with my background in environmental toxicology research I decided to dig deeper. Since I come from a western science background, scientific papers are the knowledge base I have access to. Others of you may be able to talk to community members with personal experience and practical plant knowledge. No matter where your information comes from, written or oral, ask questions and fact check. This is what I found in the scientific research literature.

Plants called “Labrador tea” are found across North America, Europe and Asia [1]. Although all the plants look similar there are actually 3 separate but related species (like cousins) with different chemical properties [2].

Current Latin*	Names for Labrador Tea			Notes
	Previous Latin	Cree	Common English	
<i>Rhododendron groenlandicum</i>	<i>Ledum groenlandicum</i> ; <i>Ledum latifolium</i>	maskêkwâpoy	Labrador tea, bog Labrador tea, muskeg tea, swamp tea, Hudson's bay tea.	By far the predominant species found in Saskatchewan, and the rest of Canada.
<i>Rhododendron tomentosum</i>	<i>Ledum palustre</i>		Marsh Labrador tea, wild rosemary, marsh rosemary, northern Labrador tea.	Common species in Europe. Before 1416 used in German beer to make it more intoxicating.
<i>Rhododendron neoglandulosum</i>	<i>Ledum glandulosum</i>		Western Labrador tea, Trapper's tea.	Mainly found in BC, California and Colorado.

*These species were recently scientifically reclassified

Ledol is the compound of concern when consuming “Labrador tea”. It is naturally found in plants. Ledol has a narcotic effect when consumed by humans. In low doses ledol is hypothesized to act like caffeine, but at high doses it can cause intestinal ailments, vomiting, dizziness, exhaustion and affects the central nervous system (cramps, seizures, paralysis, breathing problems)[1]. Annoyingly “dose” volume is not specified in the papers, sorry.

Scientific studies have shown that *R. tomentosum* (common variety in Europe) has high concentrations of ledol. Up to 48.2% of its essential oil can be ledol. This explains the negative experiences of Europeans consuming European “Labrador tea” beverages, and the folklore surrounding its use in German beer to make it more intoxicating [1].

However, studies of North American “Labrador tea” (*R. groenlandicum*) have found either no ledol (0%) or negligible concentrations (<1%) in the essential oil. These studies were conducted

using *R. groenlandicum* plants from Quebec, Ontario, and Alaska. Saskatchewan *R. groenlandicum* has not been studied for ledol content. However since studies done with Quebec, Ontario and Alaskan plants have found negligible concentrations, it is likely that Saskatchewan plants, situated geographically in the middle of these bookends, would also only contain negligible concentrations. The general lack of warnings associated with picking and brewing wild Labrador tea in Saskatchewan (ex: it's a favourite fireside drink while camping) appears to corroborate the scientific findings. Again, ask around for yourself.

Species	Location	Ledol (percentage of essential oil)	Reference	Notes
<i>R. groenlandicum</i>	Barry's Bay, ON	None found	Belleau & Collin, 1993, review	
<i>R. groenlandicum</i>	Quebec	0 - 2.3%	Lawrence, 2012, review	
<i>R. groenlandicum</i>	Chicoitimi & Girardville, QB	Unsuccessful efforts to find ledol	Belleau & Collin, 1993, review	Paper concluded that the studied plants in Quebec were more likely linked to Alaskan species studied than European varieties which are rich in ledol.
<i>R. groenlandicum</i>	Quebec; 12 essential oil samples from various Quebec producers	11/12 samples had no ledol, One sample had 0.3%	Collin, 2015	
<i>R. groenlandicum</i>	Alaska	Main compound identified was not ledol like it was in <i>R. tomentosum</i> from Finland	Belleau & Collin, 1993, review	
<i>R. groenlandicum</i>	Finland	None found	Lawrence, 2012, review	
<i>R. groenlandicum</i>	Commercial oil	0.2%	Lawrence, 2012, review	
<i>R. tomentosum</i>	Finland, south	Main compounds were myrcene, palustrol and ledol	Belleau & Collin, 1993, review	
<i>R. tomentosum</i>	Moscow province	20-36%	Belleau & Collin, 1993, review	
<i>R. tomentosum</i>	Groningen, Netherlands	Present in essential oil (amount not specified)	Belleau & Collin, 1993, review	
<i>R. tomentosum</i>	Vilnius region, Lithuania	30.5%	Dampc & Luczkiewicz, 2014	
<i>R. tomentosum</i>	Tomsk province, Russia	3.90%	Dampc & Luczkiewicz, 2014	
<i>R. tomentosum</i>	Poland	2.3 - 8.1%	Jesionek et. al., 2019	2 sample areas
<i>R. tomentosum</i>	Finland	22.4 - 32.6%	Jesionek et. al., 2019	3 sample areas
<i>R. tomentosum</i>	Sweden	6.1%	Jesionek et. al., 2019	1 sample area
<i>R. tomentosum</i>	Lithuania	5.2 - 11.1%	Jesionek et. al., 2019	2 sample areas
<i>R. tomentosum</i>	Lithuania	21.0 - 36.5%	Jesionek et. al., 2019	5 sample areas
<i>R. tomentosum</i>	Estonia	11.8 - 18.3%	Jesionek et. al., 2019	4 sample areas
<i>R. tomentosum</i>	Eastern Estonia	5.2 - 23.4%	Judzientiené A, Budiené J, Misiunas A & Butkiené R, 2012	Percentage varied by sample site. Central and Northern Europe have ledol as a main component. Percentage also changes by plant part (i.e. leaves, stems, shoots)
<i>R. tomentosum</i>	Russia	10.2 - 27.5%	Jesionek et. al., 2019	4 sample areas
<i>R. tomentosum</i>	Russia	7.4 - 9.6%	Jesionek et. al., 2019	4 sample areas
<i>R. tomentosum</i>	Russia	0 - 4.5%	Jesionek et. al., 2019	24 sample areas
<i>R. tomentosum</i>	China	0	Jesionek et. al., 2019	3 sample areas
<i>R. tomentosum</i>	China	1.7%	Jesionek et. al., 2019	1 sample area
<i>R. tomentosum</i>	North Korea	0	Jesionek et. al., 2019	1 sample area

The similarity between the common names of the Eurasian (*R. tomentosum*) and Canadian (*R. groenlandicum*) “Labrador tea” species (ex: bog vs marsh Labrador tea), as well as the failure of some research paper authors to differentiate between species when discussing study results [2], are likely causes of the current confusion. Some wild crafting blogs have taken up the general Labrador tea warnings without being ledol content specific (better safe than sorry), and so non-specific concern has spread. Boreal Heartland sells products commonly used by Northern communities but utilizes product label warnings to ensure consumers are aware of any potential hazards.

So, how much is too much?

Personally, with the available information, I would have a cup a day with no fear. However, as Canadian Labrador tea (*R. groenlandicum*) has been used as medicine by Indigenous peoples I wouldn't drink a *litre* every day. Moderation and variety are part of a healthy diet. Suggestions for brewing found in the literature suggest 1 tsp per cup of boiling water steeped for 3-10 min, 1-2 tbsp per cup, about 30 pieces per cup and 3 tbsp to a handful per kettle [1]. Prolonged boiling (>15 min) releases more ledol if it is present. However the same paper also mentions that Indigenous communities have boiled the leaves on a stove for days to make a beverage [1]. Remember only negligible levels of ledol have been found in North American Labrador tea (*R. groenlandicum*) so extended steeping has low risk. Europeans do not have a history of making Labrador tea beverages probably due to the high ledol content in their plants [1].

I have made iced teas with our Relaxation blend by steeping overnight and have felt no ill effects. One staff member boils and then simmers Labrador tea for a good while until it gains "the coveted rosy color" and she has always used it as an everyday tea and heard no warnings. Another makes it over the fire while camping by steeping leaves in a roiling boil until there's a "good colour". The first cup is poured and the rest is left near the fire to stay warm and steep some more. Labrador tea is a daily camping drink for him. Staff also add Labrador tea leaves to water bottles to give it a little flavour.

So how much is right for you? Ask people around you what their experiences are. Read articles with references so you can check the information yourself. Then make a common sense decision.

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