

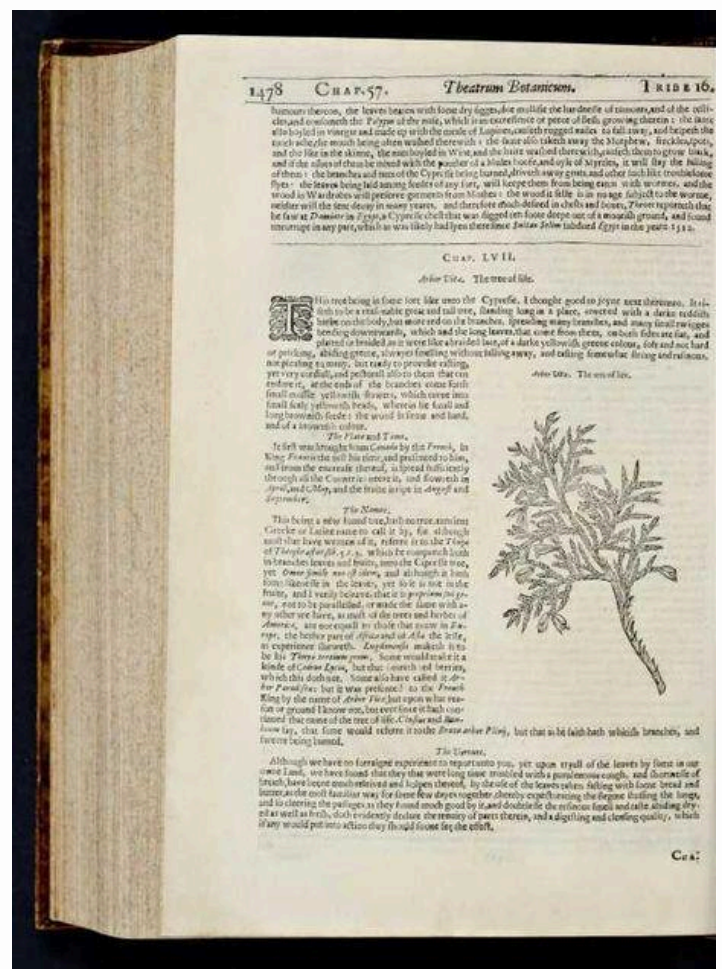


## Arbor Vitae: In Search of the Tree of Life

Ashley Buchanan

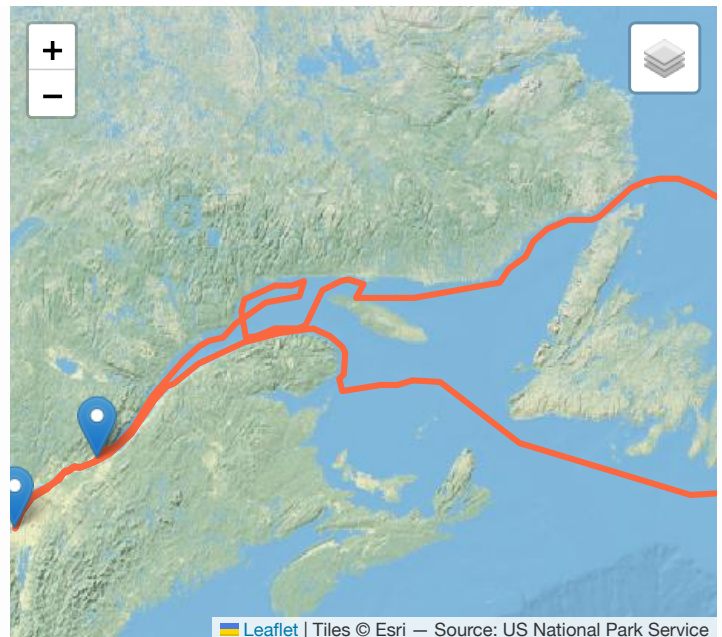
### The Mysterious Tree of Life

In his 1640 herbal *Theatrum Botanicum*, John Parkinson described the “tree of life,” or “arbor vitæ,” as “a tall tree being similar to a cypress and covered by a dark reddish bark on the trunk and an even redder bark on the branches.” Parkinson went on to explain that the tree, unknown to the ancients, originated in the New World and was introduced to Europe by the French. He explained that while it was presented to the French King, Francis I, as the tree of life he had no idea why. Clearly, Parkinson was unaware of the miraculous stories associated with arbor vitæ.



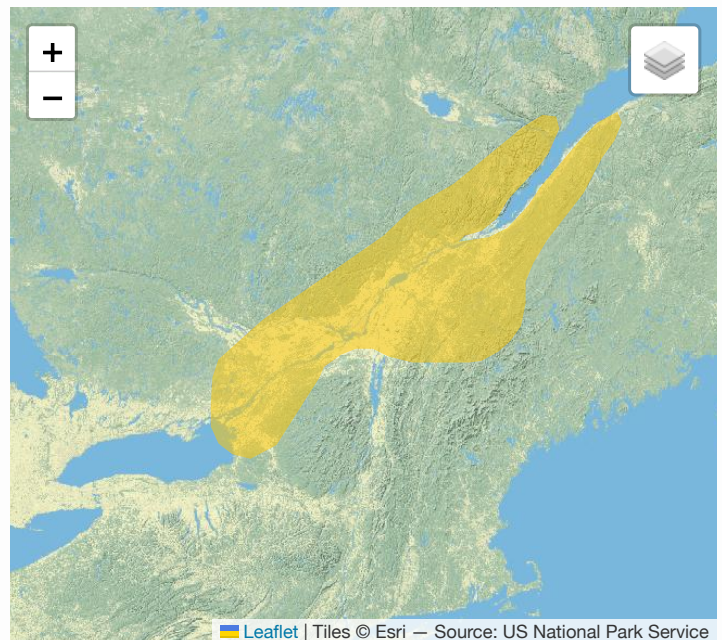
⋮ Theatrum botanicum, 1640 p. 1478

A century earlier, French explorer Jacques Cartier and his crew learned of the tree and its astonishing medicinal effects from the St. Lawrence Iroquois Indians of Eastern Canada while exploring the Gulf of St. Lawrence and the St. Lawrence River. The Indigenous people of this region used numerous local plants to treat disease and survive the region's harsh winters.<sup>1</sup> The French explorers, however, were far less equipped to survive the unforgiving environment they found themselves stranded in during the winter of 1535–36. Suffering from a mysterious disease that threatened to kill more than half of his crew, Captain Cartier turned to the St. Lawrence Iroquois for help.



⋮ Gulf of Saint Lawrence

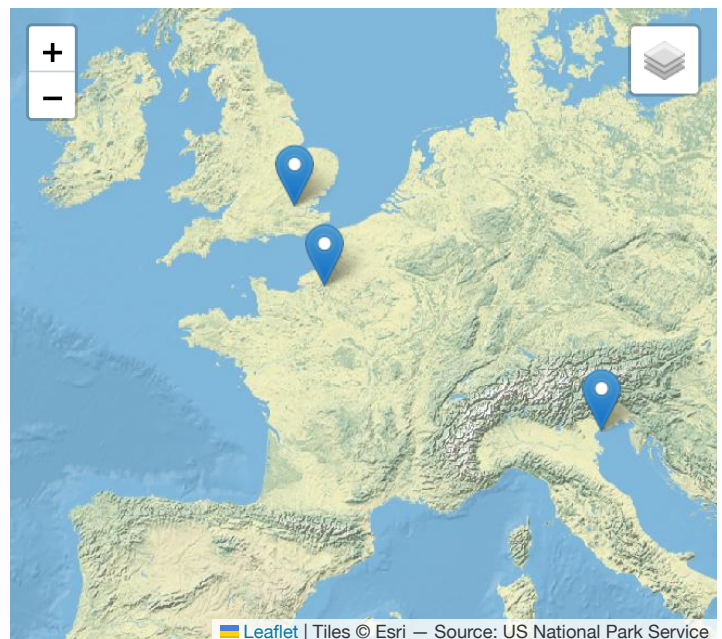
Captain Cartier had noticed that some of the local Indians also suffered from the same affliction as his men, but unlike his men, they made full recoveries. Cartier soon learned of a medicinal decoction (or tea) the locals made and drank from a “[certain tree](#)” to treat the illness. Eventually, Cartier convinced a local young man named Domagaia to share his therapeutic secret. Domagaia sent a couple of women to fetch about a dozen branches of the tree. The bark and leaves were boiled to make a decoction, which Cartier and his men were instructed to drink every other day. They were also instructed to put the dregs of the mixture on the legs of the sick. Within six days, Cartier's crew was cured.



⋮ Gulf of Saint Lawrence

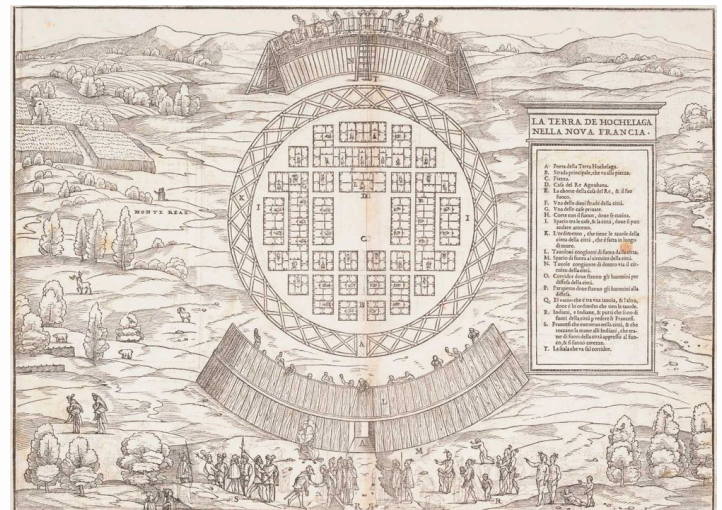


Thanks to the medicinal knowledge of the St. Lawrence Iroquois, Captain Cartier and crew returned home safely with fascinating tales of “New France” and the local Indigenous populations. Just five years later, in 1541, Cartier was sent back to the region on a colonizing expedition. In the end, neither of Cartier’s explorations yielded material wealth for the crown. As both were considered financial failures, there was little effort to publish any accounts of either journey. Fortunately, a Venetian diplomat and cartographer was interested in Cartier’s tales of explorations. In 1550, Giovanni Battista Ramusio translated and published a collection of travel narratives, *Navigazioni et viaggi*, which included a first-hand account of Cartier’s first voyage and interactions with the St. Lawrence Iroquois.<sup>2</sup> Thirty years later, John Florio translated Ramusio’s account of Cartier’s voyages into English. Cartier’s own account in French, however, would not be published until 1598.



Locations where accounts of Cartier's expeditions were...

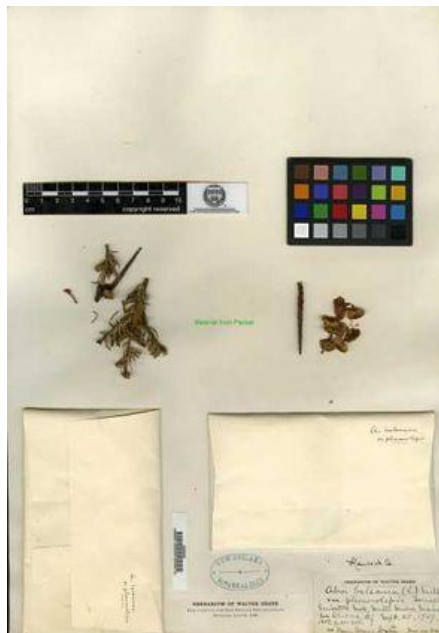
According to Ramusio’s narrative, the tree used to cure the French explorers was called “Ameda” in the local language. Florio’s translation also refers to the tree only by its indigenous name. In fact, all early translations of the account, published by Ramusio (1550), Florio (1580), and the English author Richard Hakluyt (1600), provide nearly identical accounts, pointing to a close translation of the same source. Sadly, none provide an in-depth physical description of the tree called Ameda. Lacking any first-hand accounts with detailed physical descriptions, naturalists, botanists, and historians have debated the identity of the tree of life for more than 450 years.



La Terra De Hochelaga Nella Nova Francia, plan dessiné par...

# Indigenous Coniferous Medicinal Knowledge

Through linguistic, botanical, and historical analysis numerous trees have been put forward as the miraculous tree that saved Cartier and his men—the balsam fir (*Abies balsamea*), white spruce (*Picea glauca*), red spruce (*Picea rubens*), black spruce (*Picea mariana*), eastern white pine (*Pinus strobus*), red pine (*Pinus resinosa*), white cedar (*Thuja occidentalis*), and eastern hemlock (*Tsuga canadensis*). Even sassafras (*Sassafras albidum*) has been considered, although it is generally agreed that based on sixteenth-century descriptions and its natural distribution, sassafras could not be a candidate.



⋮ Isosyntype of *Abies balsamea*



⋮ Holotype of *Picea glauca*



⋮ Holotype of *Picea mariana*

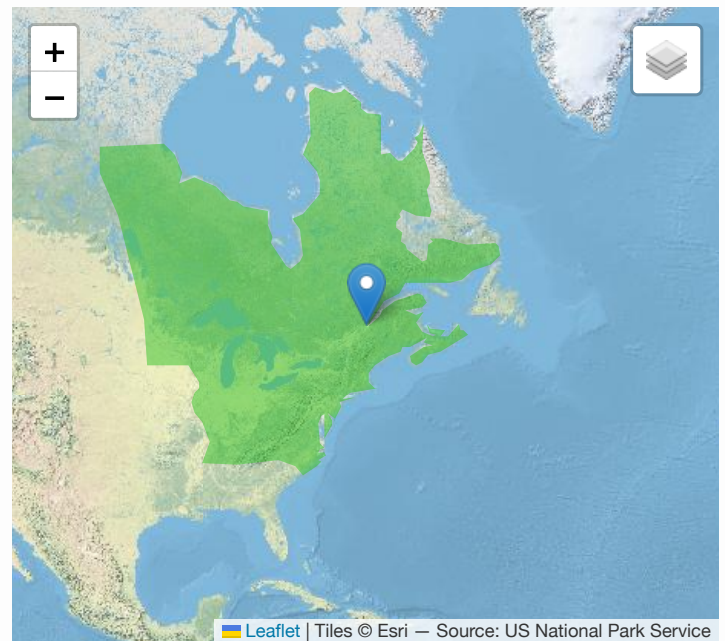


⋮ Type of *Pinus strobus*



⋮ Lectotype of *Thuja occidentalis*

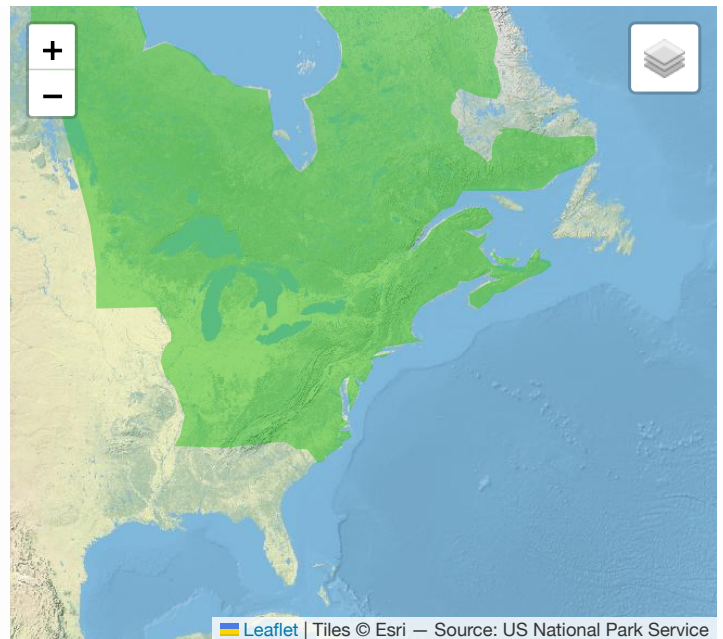
Sixteenth- and seventeenth-century European herbals consistently describe the tree of life as a *Thuja* (a genus of coniferous trees) or similar to a cypress, without fruit (although the cone is now considered a fruit), and very aromatic. From this we can conclude that the tree of life was indeed an evergreen coniferous tree native to the area around present-day Quebec and Montreal.



⋮ Quebec City

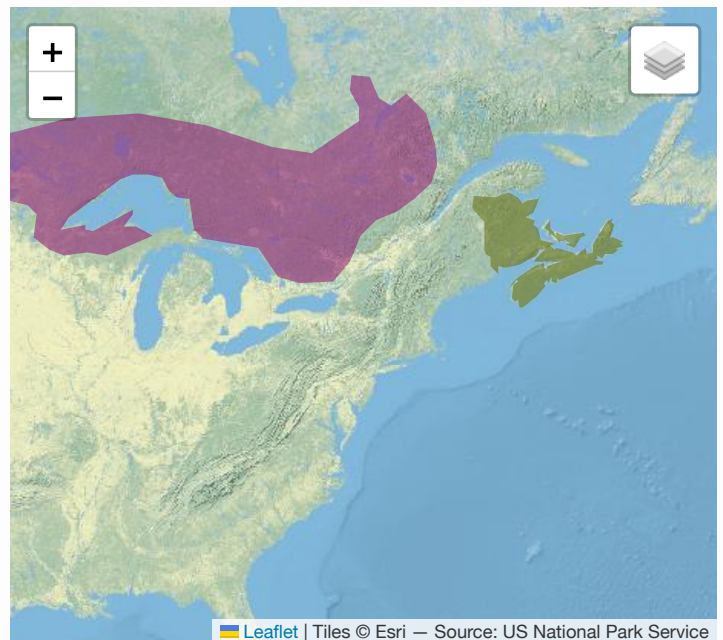


Canada is home to approximately 30 species of coniferous trees, which, sometimes called evergreens, keep their foliage year-round.<sup>3</sup> For the Indigenous peoples of eastern Canada, coniferous forests offered sources of food, building materials, and medicines for human survival. Thanks to their general distribution, ability to survive cold climates, easy identification, and their very real pharmacological properties, coniferous trees were used medicinally by all indigenous groups of eastern Canada. The tannins of coniferous trees have astringent and antiseptic properties, while their resins and essential oils have aromatic and stimulant properties.<sup>4</sup> More importantly, many conifers contain high levels of vitamin C.



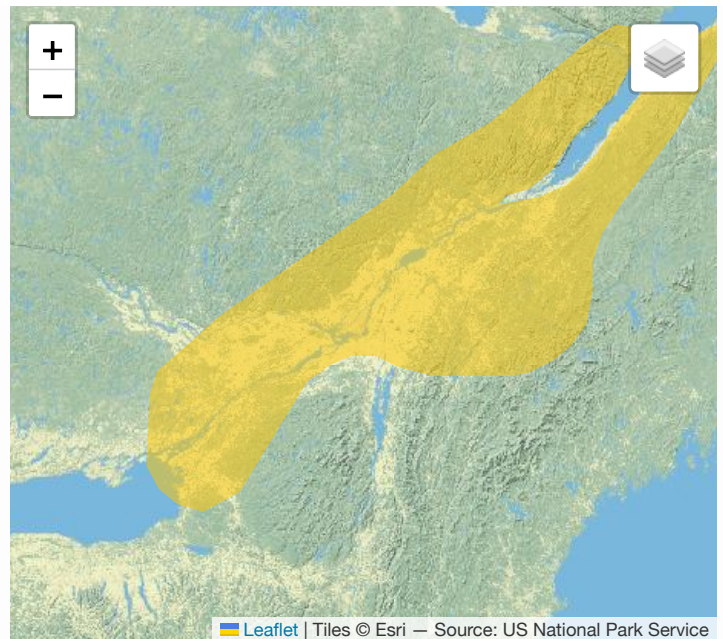
⋮ Thuja Distribution

The Ojibwa and many other Indigenous peoples of eastern North America boiled the leaves of several local conifers, notably common juniper and white cedar, to make medicinal teas.<sup>5</sup> The inner bark of the balsam fir was also used to brew a medicinal tea by the Mi'kmaq and Maritime Indians. Unfortunately, the St. Lawrence Iroquoians Cartier encountered disappeared sometime in the late sixteenth century, but the continued use of conifers for medicinal teas by many of their neighbors and successors highlights these populations' knowledge of their natural resources and success in creating a local subsistence base.



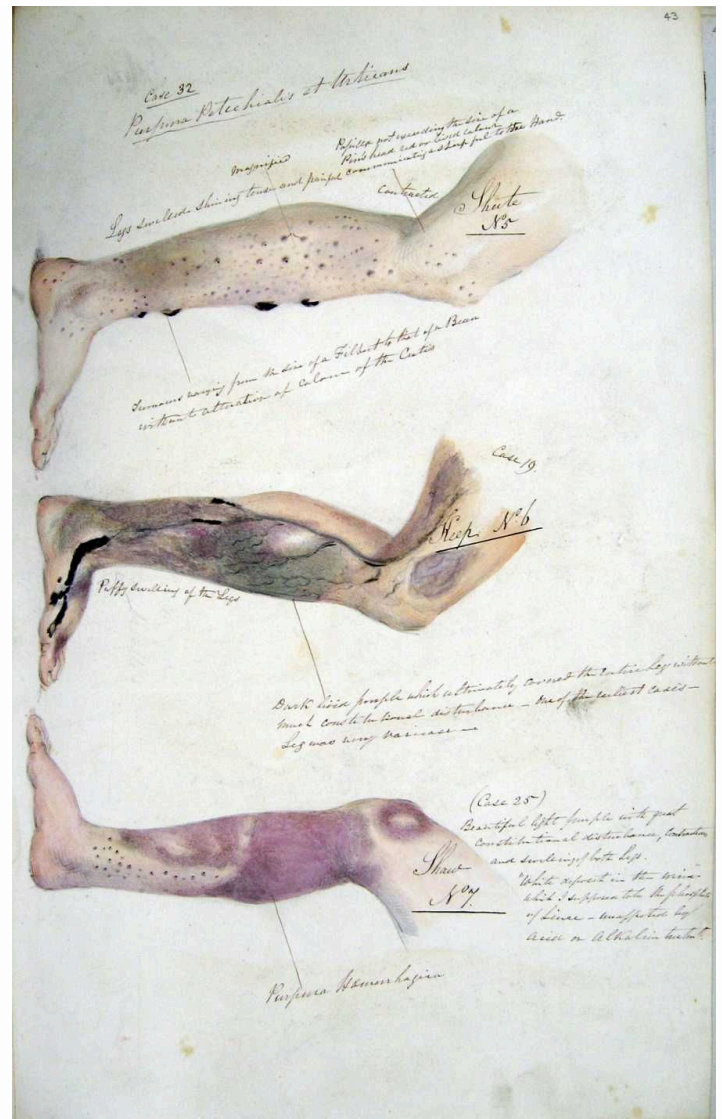
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Unlike the European view of Indigenous medicines, which they often described as panaceas, the Iroquois practiced (and continue to practice) a form of sympathetic medicine. That is to say that the Iroquois identified relationships between cure and disease and often prescribed specific plant remedies for specific ailments.<sup>6</sup> We can see this in the case of the tree of life. When Cartier implored Domagaia for the secret to his miraculous recovery from the illness that plagued his men, Domagaia explained that “he had taken the juice and sappe of the leaves of a certaine tree, and therewith had healed himself: For it was a singular remedie against that disease.” Over the centuries of surviving the harsh winters of eastern Canada, the St. Lawrence Iroquois had developed a successful treatment for a disease that commonly beset individuals living in cold climates—scurvy.



⋮ Territory occupied by the St. Lawrence Iroquoians, circa...

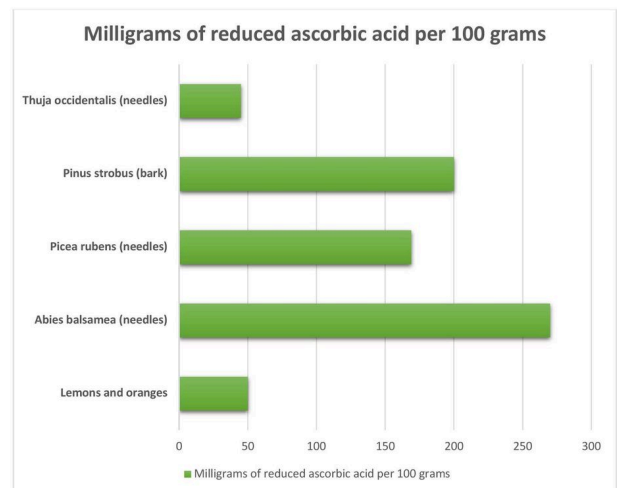
Scurvy is an acute chronic illness caused by a dietary deficiency of ascorbic acid, or vitamin C.<sup>7</sup> Historically, scurvy was common in sailors because sea voyages often required long periods of time at sea without fresh fruits and vegetables (common dietary sources of vitamin C). Lacking vitamin C, the human body cannot properly use the carbohydrates, fats, and protein it digests. Untreated, scurvy leads to exhaustion, anemia, bleeding and bruising, pain in the limbs (especially the legs), swelling of extremities, and in severe cases decay of gum tissue and loss of teeth. While scurvy is generally thought of as a maritime disease, we now know that exposure to long periods of cold temperatures can also lead to ascorbic-acid insufficiency and cause scurvy. This is exactly what happen to Cartier's men, who, thanks to that winter's icy conditions, were stranded in the Gulf of Saint Lawrence.



⋮ A case of Scurvy journal of Henry Walsh Mahon



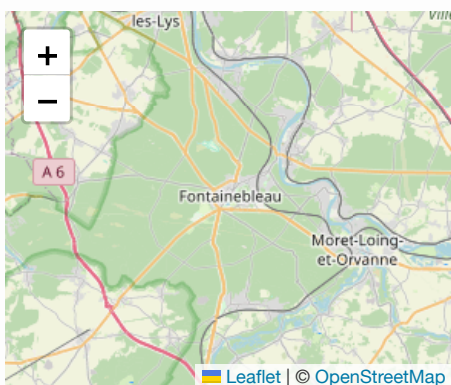
Today, adult scurvy is treated with 300–1,000 mg of ascorbic acid per day. Although lemons and oranges are traditionally associated with high levels of vitamin C (50 mg/100 g) the reduced ascorbic acid in 100 grams of fresh needles and shoots from many conifers exceeds or matches the vitamin C in citrus. For example, balsam fir has 270 mg, red spruce 169 mg, and white cedar 45 mg.<sup>8</sup> Furthermore, as Don J. Durzan has highlighted in his scientific analysis of coniferous biofactors, in the winter when food was scarce and the temperature plummeted, the coniferous trees of life provided vital vitamins, arginine, proline, other conditionally and essential amino acids, and antioxidants, all of which aided in the recovery from scurvy.



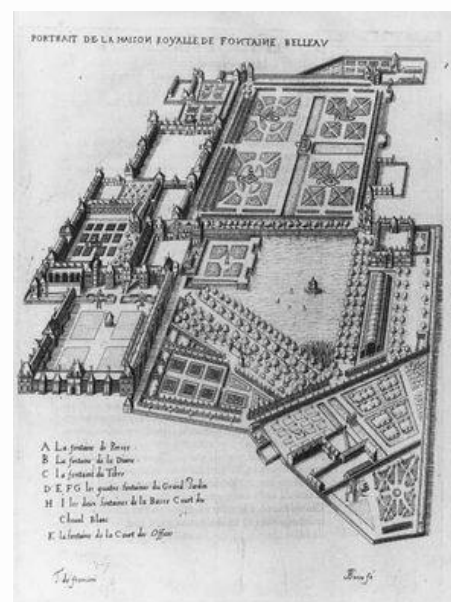
⋮ The vitamin C in lemon and oranges compared to the needles...

## Identifying the Tree of Life

Cartier returned to France with seeds from the Ameda tree, which were presented to the French King, Francis I, as from the tree of life. Unfortunately, because accounts of Cartier's explorations were not widely published until the end of the sixteenth century, the miraculous story of the arbor vitæ was not well known until well into the seventeenth century. We do know, however, thanks to a French naturalist, Pierre Belon, that the seeds presented to the king were planted and the tree later propagated in France. In 1553, Belon wrote the first botanical work devoted to coniferous trees, in which he noted that there were many arbor vitæs growing in the royal garden at Fontainebleau. Unfortunately, Belon makes no mention of Cartier and his crew's recovery or where the tree originated, only that the tree was brought to the King and was given the name arbor vitæ.

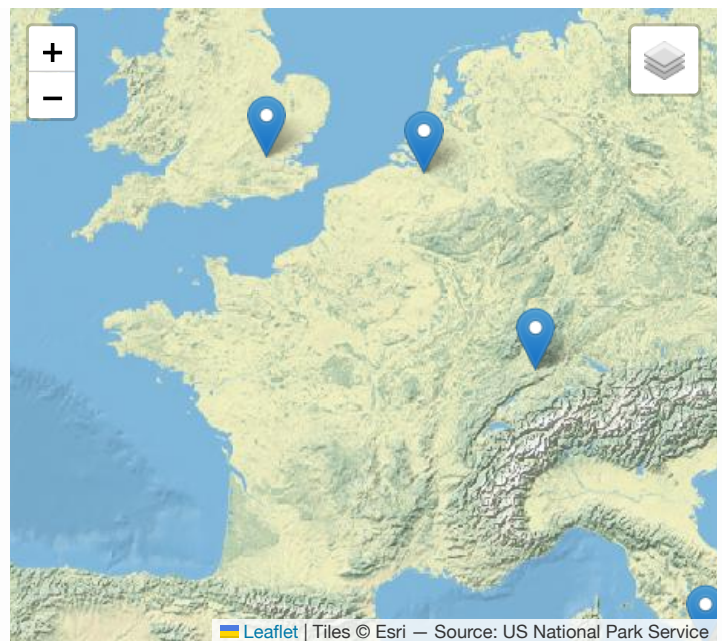


⋮ France



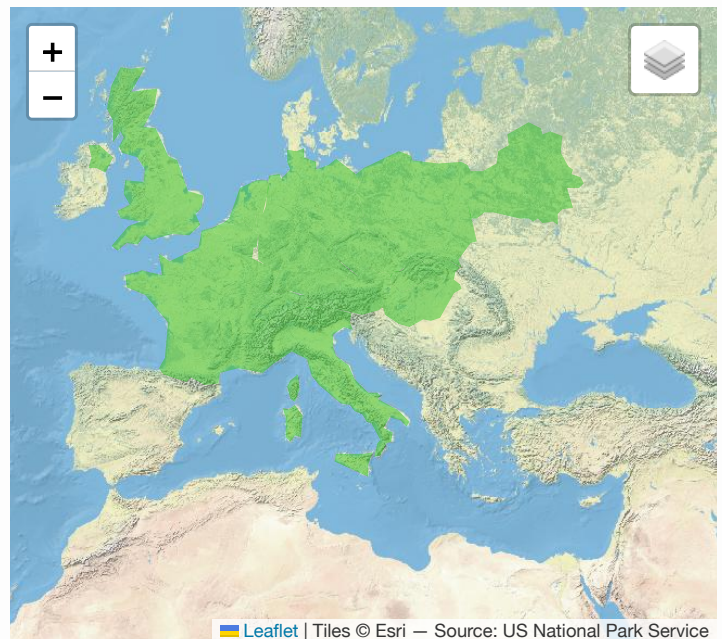
⋮ Fontainebleau bird's eye view

From Belon's work, we can trace the knowledge, or lack of knowledge, of the arbor vitæ in Europe through herbals. Arbor vitæ appears in the herbals of Matthias de l'Obel (1576), Castore Durante (1585), John Gerard (1597), Caspar Bauhin (1598), Carolus Clusius (1601), and John Parkinson (1640).<sup>9</sup> From these works it is clear that much of the knowledge surrounding the arbor vitæ—where it came from, its medicinal properties, and why it was called the tree of life—had already been lost. While all similarly describe the physical attributes of a coniferous tree deemed the tree of life, only Bauhin, Clusius, and Parkinson placed the origin of the tree in Canada, and none mention Cartier and the Ameda tree. Clusius, having seen the tree in the botanical garden of the French King, also noted that the arbor vitæ was now “so widespread that everyone with a passion for horticulture grows one in his garden.”



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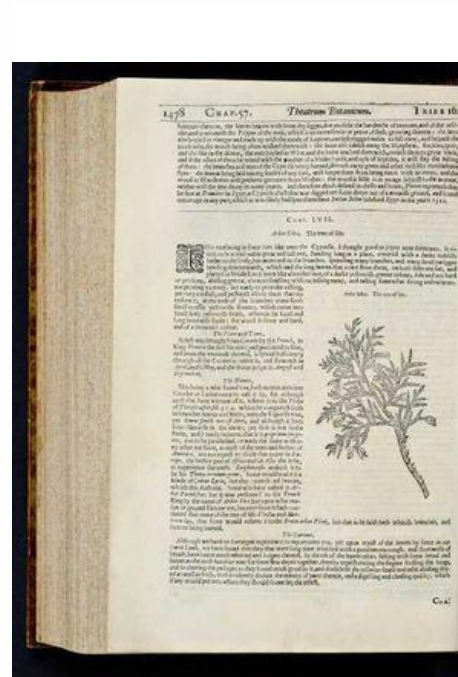
It is clear that by the mid-seventeenth century much of the medicinal knowledge associated with the arbor vitæ was lost. Further complicating matters of identification was the rate at which the arbor vitæ spread through Europe and the tendency to call any conifer imported from North America an arbor vitæ. Conversely, many American conifers were simply named in terms of their European counterparts and identified as a thuja or cedrus. Thus, by the end of the sixteenth century, the arbor vitæ was also known as “*Thuja theophrasti*” and “*Cedrus Lycia*.”



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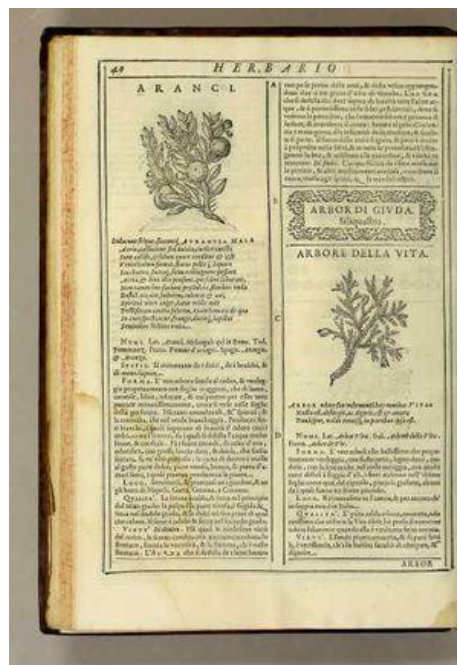
In 1753, botanist Carl Linnaeus's pioneering work, *Systema Naturae*, which cemented a system of binomial classification for plants, identified the arbor vitæ, the *Thuja Theophrasis*, and the *Thuja strobilis lævibus* as the same plant, which he reclassified as *Thuja occidentalis*. Since then, *Thuja occidentalis* has generally been accepted as the Ameda tree that saved Cartier and his men.



⋮ Theatrum botanicum, 1640 p. 1478



⋮ Caroli Clusi Atrebatensis, 1601, p. 36

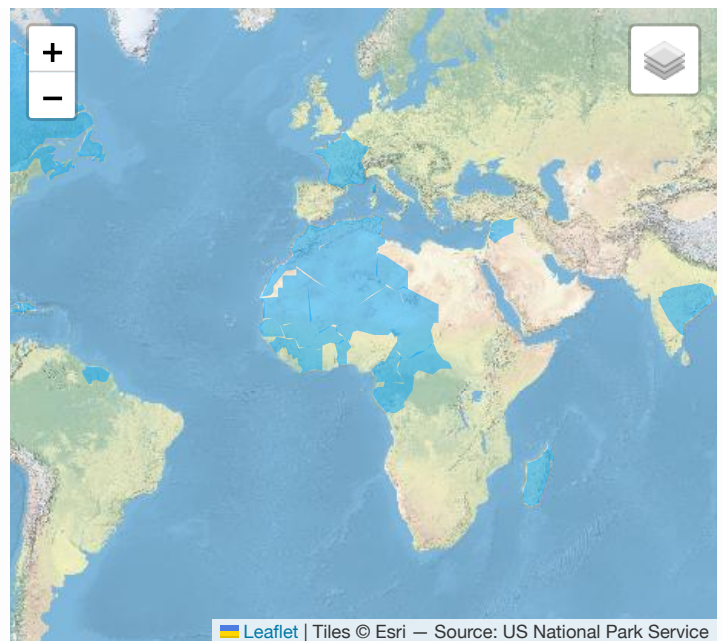


⋮ Herbario nuovo, 1585, p. 40



⋮ Systema Naturae p. 1002

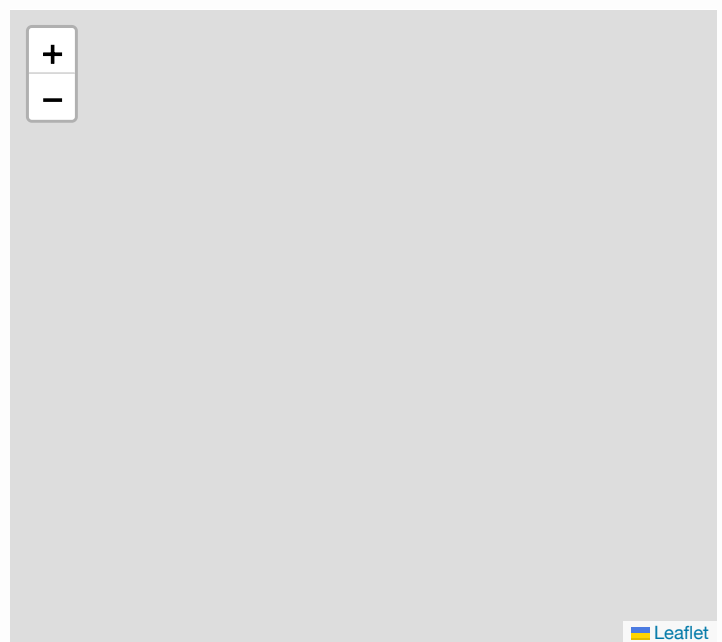
Although tales of Cartier's explorations were not initially widely published, interest in them, as well as identifying the tree that miraculously cured scurvy, increased in the eighteenth and early nineteenth centuries as the European colonial enterprise expanded. Numerous naturalists, botanists, and historians have attempted to confirm the identity of Ameda as *Thuja occidentalis* or prove it wrong. While *Thuja occidentalis* remains the consensus, other strong contenders are the white spruce and the eastern white pine, since both have names in the Mohawk language, "onnita" and "ohnehta" respectively, that sound similar to later European spelling varieties of Ameda (Anneda, Annedda, and Hanneda). Finally, many argue that it was the balsam fir, as it has the highest levels of vitamin C (270 mg) of any North American conifer.



⋮ Territory of the First French Empire (blue) and Second...

## Freedom From Scurvy

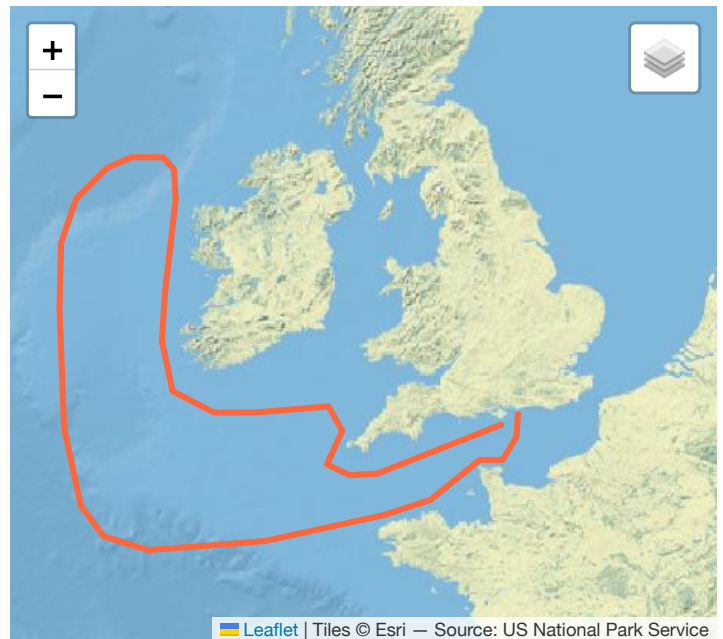
The Scottish surgeon James Lind (1716–1794) is typically credited for solving the mystery of scurvy and discovering its cure. But as Lind explained in his 1772 *A treatise of the scurvy*, he was keenly aware of the therapeutic properties of "spruce beer," which he knew to be a common drink of the indigenous peoples of Newfoundland and because of which "they kept pretty free from the scurvy." Lind also mentioned Cartier's Ameda tree and, like so many before him, offered an identification, calling it "the large swampy American spruce tree." Lind's treatise promoted a decoction of "the tops, cones, leaves, or even green bark and wood of these trees" as an excellent antiscorbutic medicine. However, Lind saw "spruce beer" and decoctions of coniferous trees more as preventative medicines.



⋮ Newfoundland

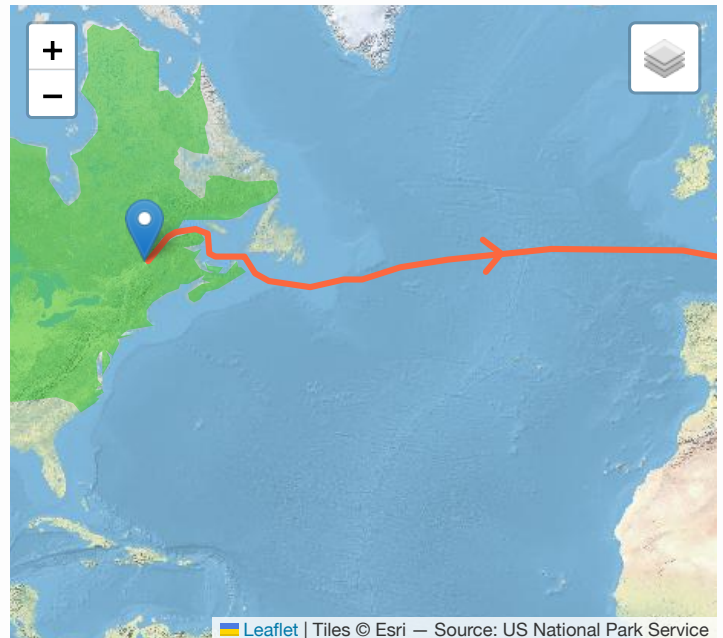


During his tenure as ship surgeon on the HMS Salisbury, Lind observed and recorded the effects of scurvy and carried out an early version of a controlled clinical trial on the men aboard. For one of the groups of afflicted sailors, Lind added orange and lemon juice to their meals. This group of men recovered and Lind's experiment forever linked scurvy treatment with citrus, and eventually vitamin C.<sup>10</sup> While citrus fruits have become firmly associated with the treatment of scurvy, the coniferous teas prepared by the Indigenous peoples of eastern Canada were a more effective therapeutic (in both prevention and treatment), since they provided higher levels of vitamin C as well as other important biofactors.



⋮ Journey of the HMS Salisbury

Sadly, we may never know for sure exactly which tree was used to make the medicinal tea that saved Cartier and his men. It is more likely that the Indigenous peoples of the region knew that many of the local coniferous trees could be used for the same medical purpose together or interchangeably. What we do know, however, is that the indigenous knowledge of the therapeutic properties of coniferous trees not only saved the lives of early explorers and colonizers, it was essential in the development of our understanding and treatment of scurvy.



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## References

1. For the purposes of this work, “Indigenous people(s)” refers to a cultural group(s) in an ecological area that developed a successful subsistence base from the natural resources available in that area. ↩
2. As a diplomat, Rasmusio was said to have used his political influence to collect original travel narratives. ↩
3. <https://www.thecanadianencyclopedia.ca/en/article/coniferous-trees> ↩
4. Don J. Durzan, “Arginine, scurvy and Cartier’s ‘tree of life,’” *Journal of Ethnobiology and Ethnomedicine* 5:5 (2009), DOI:10.1186/1746-4269-5-5 ↩
5. Harriet V. Kuhnlein and Nancy J. Turner, *Traditional Plant Foods of Canadian Indigenous Peoples: Nutrition, Botany and Use* (New York: Routledge, 1991). ↩
6. James William Herrick, *Iroquois Medical Botany* (Syracuse: Syracuse University Press, 1977). ↩
7. Durzan, “Arginine, scurvy and Cartier’s ‘tree of life.’” ↩
8. Durzan. ↩
9. Bauhin’s 1598 herbal is actually an edited and expanded edition of Mattioli’s seminal work, *I Discorsi*. Arbor vitæ tree does not appear in Mattioli’s original herbal. ↩
10. James Lind, *A Treatise on the Scurvy: In Three Parts, Containing an Inquiry Into the Nature, Causes, an Cure, of that Disease, Together with a Critical and Chronological View of what Has Been Published on the Subject*, 3rd ed. (London: S. Crowder et al., 1772). ↩

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