

# Cranberries

*Of the Ericaceae Family*

Large Cranberry (*Vaccinium macrocarpon*)

Small Cranberry (*Vaccinium oxycoccos*)

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EEB 455: Ethnobotany

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Key

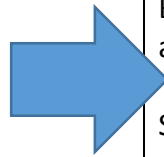
(+) Benefits  
Cranberries

(-) Detriment  
to Cranberries

## Winter

Left over berries may freeze and overwinter to start new plants in the spring (+)

Heavy snowpack insulates them, cover minimizes chance that they get eaten or damaged (+)



## Spring

The plant puts out new shoots (+)

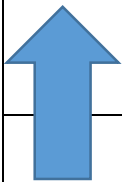
Berries that survived may be buried by moss and the seeds inside them may germinate (+)

Some berries that survived may be eaten by geese migrating North and disperse the seeds (+)

Other birds and animals may also eat the left over berries and disperse the seeds (+) or people may eat them (-)

## Spring/Summer/Fall

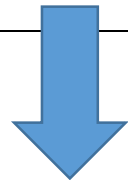
Mild fire may come through, keeping the bogs from being overgrown (+) and fertilizing them, while severe fire may kill the peat it depends on (-)



People may plant new cranberry bogs, particularly with the large cranberry (+)

## Spring/Summer

Peat moss is harvested, destroying cranberry habitat as it is slow to regrow (-)

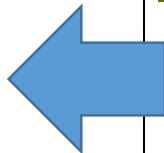


## Fall

In September or October, both of the types of cranberries will bear fruit (+)

Humans will come to forage for the fruit or will commercially harvest it (-)

Elk, black bears, foxes, squirrels, chipmunks, rabbits, grouse, pheasants and geese will come eat the berries and disperse them to new areas (+)



## Summer

The small cranberry blooms with one to four flowers per plant between May and August, with the large cranberry flowering about a month later(+)



**Small Cranberry  
Flower**

**Large Cranberry  
Flower**



## Scientific and Folk Taxonomy

Among various plants labeled as cranberries within the folk taxonomy of North America, *Vaccinium macrocarpon* (large cranberry) and *Vaccinium oxycoccos* (small cranberry) are two species with nearly identical foliage, similar berries and found growing comingling with each other in many of the same habitats in Michigan (Reznicek et al, “*V. macrocarpon*” 2011 and Reznicek et al., “*V. oxycoccos*” 2011). Thus, with such similarity between the two species in both look and habitat, it makes sense to consider the both species together.

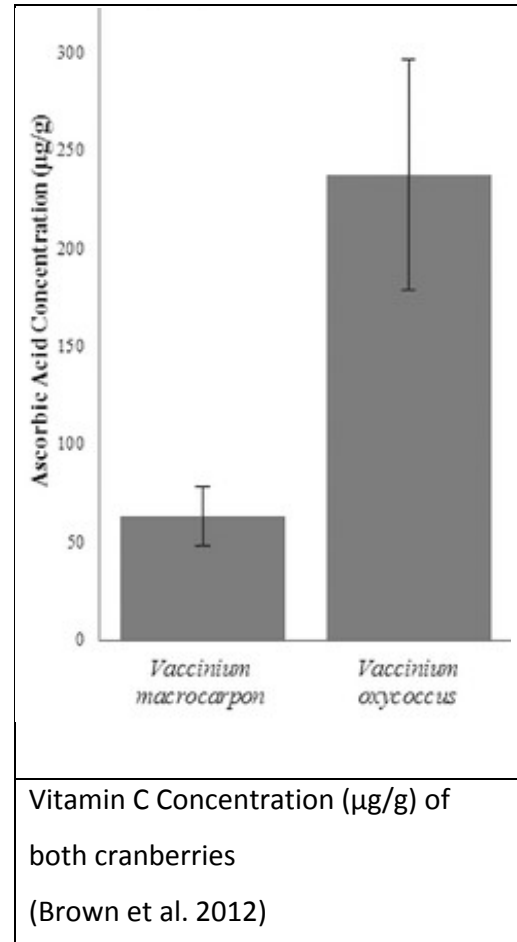
The *Anishinaabe* name traditionally for *Vaccinium oxycoccos* is *muckimin*, which means swamp berry bush (Herron 2002). Great Lakes Indian Fish and Wildlife Commission (GLIFWC) lists the Central/Western *Anishinaabe* word for large cranberry as *aniibimin* and the small cranberry as *mashkiigimin*, *-an*, *mshkiigmin* or *mashkiigiminagaawanzh*, but also gives the name for the lowbush cranberry (the subspecies *Vaccinium macrocarpon* Aiton) as *mashkiigimin*, *-ag* ("Plants"). Unfortunately, they do not give literal translations for any of them. Fascinatingly enough, there is another plant that the GLIFWC site lists as *anibimin*, the highbush cranberry (of which it cites *Viburnum opulus*), but it is in a completely separate family (Adoxaceae) than the large and small cranberries (Reznicek et al, “*Viburnum opulus*” 2011). The Native usage of that plant must have been similar to the large and small cranberries. Hence, for the purposes of this paper, the term “cranberries” refers to only *V. macrocarpon* and *V. oxycoccos*. Due to the similarity of the petals and beaked anther of cranberries to the head of cranes, they were originally known as craneberries (“NPIN” 2013). There are more than 450 species of the genus *Vaccinium*, in the family Ericaceae, across the world of which 65 have been found in North America (Brown et. al 2012). Occasionally, these two cranberries are separated within the Ericaceae family as the genus *Oxycoccus* (Reznicek et al., “*V. macrocarpon*” 2011).

## Plant Information

### Physical Characteristics

Although both species produce reddish berries, *Vaccinium macrocarpon* is known as the large cranberry due to the naturally larger size of its berry and is the species that has been most commonly cultivated commercially due to this trait (Brown et al. 2012). They are small evergreen trailing shrubs with tiny, glossy, leathery leaves that are bronzy in spring, dark green in summer and turn many different colors in fall but usually do not reach over one foot (“NPIN” 2013). The distinguishing features of the small cranberry as compared to the large cranberry are their smaller leaves with rolled under edges that are whiter underneath. Additionally, the large cranberry has stems that exceed far past the flowers or fruit while the small cranberry doesn’t have a prolonged leafy shoot, instead having a terminal stem (Reznicek et al., “*V. macrocarpon*” 2011). However, this is not always a reliable character. Brown et al. found that the wild small cranberries in British

Columbia had much more vitamin C (ascorbic acid) then commercially cultivated large cranberries there, as shown in the graph, but they didn’t report exact values (Brown et al. 2012). This perhaps makes an argument for the importance of genetic biodiversity seeing as the less cultivated cranberry is the one with the higher amount of vitamin C





Large Cranberry

(Reznicek et al., "*V. macrocarpon*" 2011)

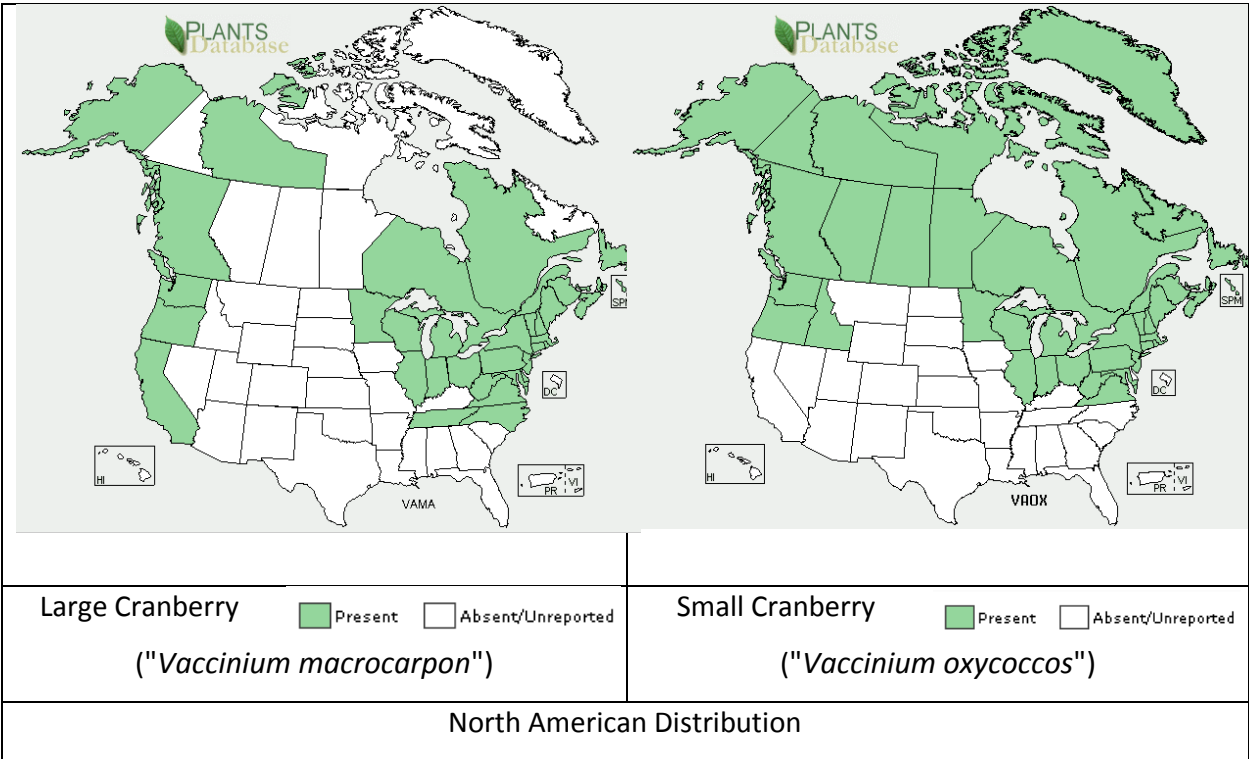
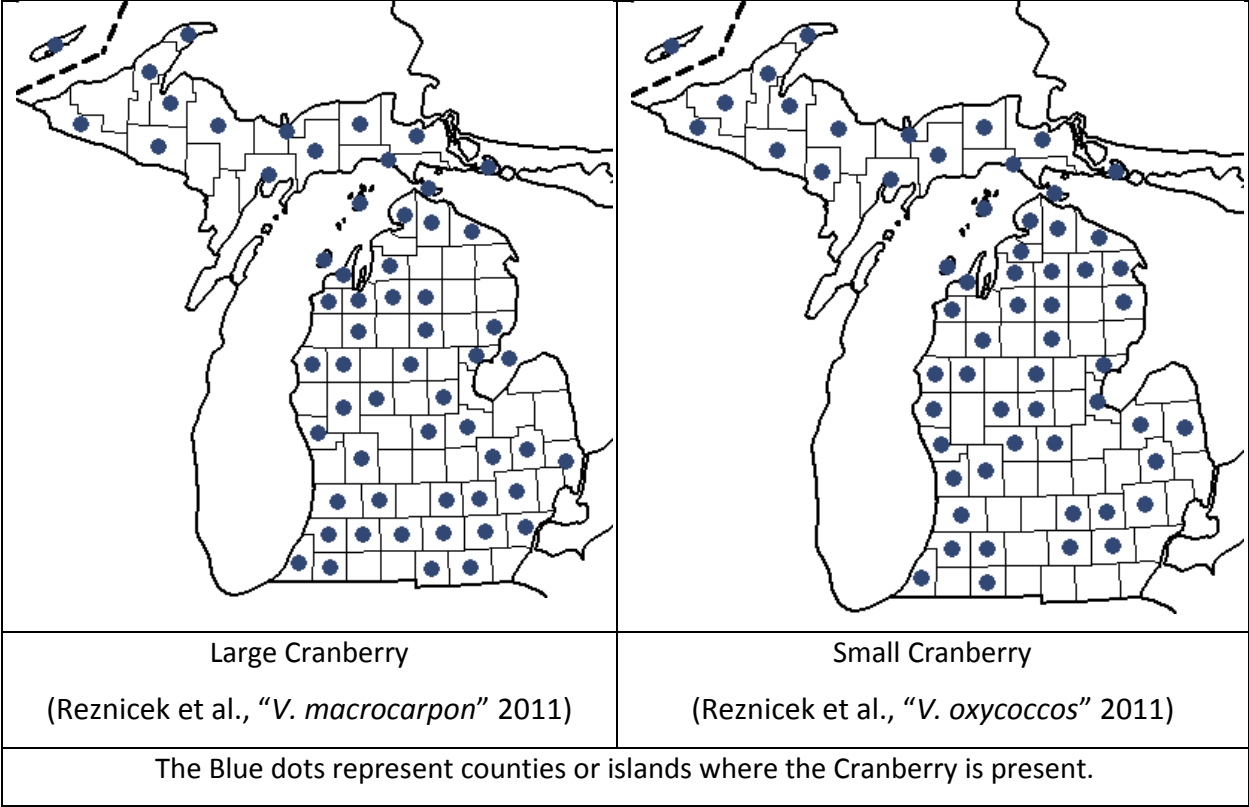


Small Cranberry

(Reznicek et al., "*V. oxycoccus*" 2011)

### Growth Requirements and their Ecosystem

Large cranberries are found on interdunal swales and hollows, poor fens and often form dense clumps on the open mat encircling the water of a bog pond (Reznicek et. al, "*V. macrocarpon*" 2011). Small cranberries are also found on bog mats, persisting under spruce and tamarack, but rarely in cedar swamps except on sphagnum hummocks (Reznicek et al., "*V. oxycoccus*" 2011). At least for the small cranberry, it is known that elk, black bears, foxes, squirrels, chipmunks, rabbits, grouse, pheasants and geese will come eat the berries (Anderson 2011). Moreover, small fires will stimulate the plants since it one of the first colonizers of burned bogs and fire stimulates berry production, fertilizing them and burning back larger brush that would overshadow the small plants. Too large of fires can decimate their habitats. The small cranberry is natively found around the globe in the more northern regions, while the large cranberry is only natively found in North America (Reznicek et al., "*V. oxycoccus*" 2011).



## Reproduction

Both species reproduce sexually via nodding flowers that are pinkish- white with four backward-pointing petals in clusters in the leaf axils (“NPIN” 2013). They have flowers with eight stamens with each anther ending in two extended slim tubules (Reznicek et. al, “*V. oxycoccos*” 2011). The large cranberry blooms about a month later than the small cranberry, usually in July or sometimes as early as mid-June in southern Michigan (Reznicek et. al, “*V. macrocarpon*” 2011). The small cranberry blooms usually in June or occasionally as late as mid-July in the Upper Peninsula. Both produce red berries in the fall (“NPIN” 2013). The large cranberry has a berry with a 9-14 mm diameter, while the small cranberry has a berry with a 6-12 mm diameter (“*Vaccinium macrocarpon*” and “*Vaccinium oxycoccos*”).

## **Human/Cultural Uses**

### 1. Food

Multiple reports of different preparations of the berries were found. Although early ethnobotanists distinguished between species, it was likely that the natives and settlers didn’t since the berries had the same usage. Settlers that moved to the Wisconsin Fox River Valley found Native Americans in the area (likely Menomoni) that harvested the cranberries in the marshes and quickly joined them in harvesting them (Aime 2013). Shortly after the middle of the nineteenth century, the people in the Midwest began cultivation of the marshes probably at the expense of the natives. The berries could fight off scurvy due to their high Vitamin C content and stay fresh for up to a year. If packed on water, it could be shipped to England as fresh as when it was picked. The lower cost of growing cranberries in the Midwest over New England started a “Red Gold” rush and birthed the Midwest cranberry industry. By 1860, so much land in the Fox River valley was under cultivation for cranberries that not all of it could be harvested.

Albert Reagan mentions in 1928 that both types of cranberries were used as food by the Bois Fort Chippewa (Ojibwe) Indians of Minnesota and sold; furthermore, Frances Densmore corroborates this with a report in the same year with a broader sample of the Ojibwe people

saying that the large cranberry was cooked probably with sugar (Reagan 1928, Densmore 1928). This was probably maple sugar, as it was what was readily available.

In Northern Wisconsin, there was a record of two different tribes using the small cranberry, although it is likely that they were also using the large cranberry and ethnobotanists didn't pick up on this (Smith 1923, Smith 1932). With the Menomini, they dried them on a thatched scaffold for winter use after gathering them in huge amounts (Smith 1923). They ate them together with dried sweet corn as a special dish. Cranberries were plentiful in the sphagnum bogs in the neighborhood of the Forest Potawatomi Indians and they ate them sweetened with maple sugar (Smith 1933).

Indeed, just as the practice of commercial harvesting goes on today in the Midwest with companies and grower cooperatives such as Ocean Spray, there are *Anishinaabek* families that gather the wild berries today (Herron 2002). They forage in bogs and swamps that have lots of sphagnum moss and eat them fresh or save them for cooking them into cranberry sauce. The small cranberry was included in table of the plants used at Lac du Flambeau and Bad River Reservations, as well as the table of plants at Walpole Island First Nation; henceforth, it indicates common Great Lakes usage.

## 2. Medicine/Modern Health Benefits

Besides the scurvy prevention already mentioned, Huron Smith found the Ojibwe in 1932 to be using the small cranberry for another medicinal use (Smith 1933). For people slightly ill with nausea, they used it as a tea. He also comments in his notes that "white men have used the bitter, astringent leaves in diarrhea and diabetes and for purifying the blood."

In modern research, cranberry juice has been found to be a significant source of useable vitamin C, but in a 2006 study the antioxidant benefits and heart benefits often touted by manufacturers were called into question (Duthie et al 2006). Non-nutritive anthocyanins, present in large amounts in cranberry juice were found not to alter blood or cellular antioxidant status in a significant way with 40 healthy female volunteers. The study authors concluded that it was important to distinguish between in vivo and in vitro studies when making conclusions. However, although the effects of antioxidants in the body at the cellular level are still

somewhat not understood, cholesterol is a measure that is much more studied. In a 2008 three month study of thirty diabetes patients, almost evenly distributed between men and women, subjects took either three capsules of cranberry extract powder daily or a placebo (Lee et al. 2008). They found that LDL (what is considered “bad” cholesterol) increased significantly for the placebo group and decreased significantly for the control group, with a significant difference between the two groups. The same was true for total cholesterol. This is much more promising for the medicinal effects of the cranberry and perhaps rings true to its blood purifying properties mentioned earlier.

However, cranberry juice has been shown to prevent urinary tract infections (UTIs). In the United States, the estimated yearly cost of community-acquired UTIs is \$1.6 billion and they are the cause of 7 million office visits per year (Wang et al. 2012). Forty children were assigned to receive daily either 2 cc/kg cranberry juice daily containing 37% Proanthocyanidins (PAC), which are compounds found in cranberries reported to have *in vitro* and *in vivo* antibacterial activity, and the placebo group was given the same volume of juice that looked the same with no PAC or other cranberry products (Afshar et al 2012). They found a 65% risk reduction in Urinary Tract Infections after one year of follow up. This is significant, considering that as antibiotic resistance increases, new alternatives will be needed. Furthermore, a meta-analysis of 13 trials found a significant protective effect of cranberry products on urinary tract infections (Wang et al. 2012). They found that “cranberry juice was noted to be more effective than cranberry capsules or tablets in subgroup analysis” and this was perhaps due to compounds only being present in the juice that weren’t present in the capsules or tablets.



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