

# Santa's reindeer-pulled sleigh fueled by lichens

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Everyone knows that Santa Claus fuels up between stops with cookies and milk left for him by children in the hope of last-minute redemption, but what of Santa's reindeer?

The most important staple of the reindeer's diet is the reindeer lichen, *Cladonia rangiferina* and related species.

Lichens are actually two separate organisms. They are made up of fungi and algae, which live and grow together in a symbiotic relationship. The spongy threads of the fungus support and protect the algal partner. The algae have chlorophyll which can make food. Lichens can survive when the temperature gets very low and there is little light. The tissues of lichens aren't easily damaged by frost. This makes it a great plant for the tundra. Lichens can survive for long periods of time without water. They just dry out and go dormant when there is little water or light. They can begin to grow again even after very long periods of dormancy.

Reindeer feed on lichen during the coldest periods of the season. They do this because it is one of the only things that they have for food when the weather is cold and there is little other vegetation left. It has lots of carbohydrates that give the reindeer energy to make body heat. Reindeer have special microorganisms in their stomachs which let them digest lichens. Very few other animals eat lichens.

Because lichens are long-lived and slow-growing, they accumulate radioactivity, especially strontium 90 and cesium 137. Trace

## Garden Tales



Reindeer lichen (*Cladonia rangiferina*) may take decades to return once

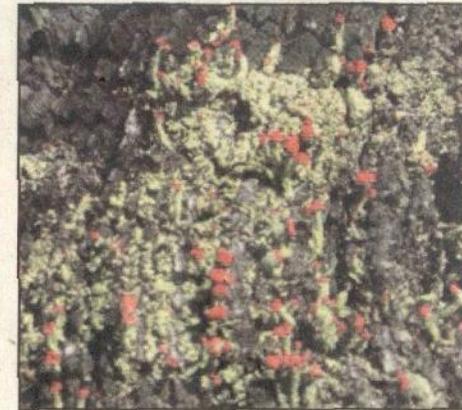
quantities of radioactive fallout from Soviet and American nuclear testing prior to 1962 can still be detected in Arctic lichens.

After the 1986 nuclear accident at Chernobyl, lichens were absorbing nuclear fallout and this was accumulating in the milk and meat of the reindeer. Thousands of reindeer, an important source of food in Scandinavia, had to be destroyed.

Delaware State University/Michael Maciarello  
**overgrazed, burned, trampled or otherwise consumed.**

Reindeer lichens also play an important role in maintaining Arctic soils. Dense mats of this light-colored lichen produce an albedo effect, reflecting radiant energy from sunlight, helping to protect and cool the permafrost in the tundra.

The British soldier lichen, *Cladonia cristatella*, which gets its name from its resemblance to the uniforms worn by English



The British soldier lichen (*Cladonia cristatella*) which gets its name from its resemblance to the uniforms worn by English soldiers during the Revolutionary War, is a close relative of the reindeer lichen.

soldiers during the Revolutionary War, is a close relative of the reindeer lichen and plays an almost identical role in the ecosystem. Both the reindeer lichen and the British soldier lichen grow in the Arctic and throughout the Northern Hemisphere.

Though I've never witnessed it, I wouldn't be surprised if, on Christmas Eve, eight tiny reindeer were snacking on the reindeer lichen that grow in Delaware, while Santa was finishing his milk and cookies.

*Editor's note: On the campus of Delaware State University, the Claude E. Phillips Herbarium is Delaware's center for research, education, and outreach about plant identifications, locations, and uses. Call 302-857-6452 (Dr. Susan Yost) to arrange a tour of the herbarium.*