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One of the contributors to the great diversity of vascular plants in New York State is the briney marine marshes, such as those dominated by *Spartina patens* and *S. alternifolia* along the Atlantic coast in and around New York City and Long Island and adjacent creeks and rivers, including the Hudson, that are influenced by the tides. Salt tolerant species naturally flourish in these areas and may not be expected inland where there is sweet or fresh water.

Underlying the surface soils of New York State there is a great band of late Silurian rocks extending in the east from all along the Niagara River gorge, all of Grand Island, and the northern part of the City of Buffalo and its suburbs west past Rochester, Syracuse and Oneida, where it narrows, finally petering out in Schoharie in the Helderberg Mountains. Late Silurian rocks can be up to 1,000 feet thick (Broughton et al., 1966). These rocks, appearing in a lurid fuchsia color on geologic maps, represent a huge salt sea extending into Canada and Michigan, Ohio, Pennsylvania, West Virginia, and are associated with the resistant rocks forming parts of Manitoulin Island and the Bruce Peninsula in Ontario. They form a huge circle in the Great Lakes region with mainland Michigan as the bullseye, the center of a wreath of Silurian rocks in the surrounding states. These rocks seem to form the outer boundary walls hydrologically limiting Lakes Michigan, Huron and Erie.

Within these Silurian rocks, generally below the water table, there is a salt bed that covers an area of 170,000 square miles. Salina, New York, now a suburb of Syracuse, owes its establishment to the presence of salt accessible by mining and was one of the major sources of inland salt. The opening of a mine shaft to a huge salt mine with over 50 miles of roads 1,200 feet below the surface is located in the City of Detroit, Michigan. The Salt Spring Lands where salt was extracted from springwater belonged inalienably to the State of New York who managed them. In the region around Syracuse there were brine springs and wells. The brine wells associated with Onondaga lake were an important source of commercial salt production during the Early National Period of the United States and Civil War periods, leading to environmental problems at the Lake - associated with salt.

Of course, for botanists interested in plant communities of salt-tolerant species, the Syracuse region abounded in plants disjunctive from the Atlantic coast, although perhaps these may have been correlated with vectors associated with weeds, as species in the Chenopodiaceae and Amaranthaceae attest.

Salt mines were also located in Wyoming Co., near Mt. Morris, in Watkins Glen on Seneca Lake, mines exist below Cayuga Lake, covering about 18,000 acres, the deepest rock-salt mine in North America being in Lansing, New York. The Retsof Mine of Retsof, New York, opened when the Niagara Reservation at Niagara Falls opened in 1885, and, until the mine closed in 1994, was "the largest salt-producing mine in North America and the second largest salt mine in the world" (Anonymous 2009).

Although the spread of halophytes in the recent literature attributes their spread to the use of salt on Interstate and Provincial Highways, some attention must be paid to halophytes associated with natural salt occurrences in the springs emanating from bedrock salt coming near to the soil surface.

In 1991 Clifford Lamere published an article on the first collection of Seaside Goldenrod (*Solidago sempervirens*) from Niagara County (Lamere 1991). The author was rather stunned to find a robust population ("22 clumps and six individual stems") of this halophyte associated with Westchester and Rockland counties there "on sandy, brackish or saline shores." It was also known to him growing in inland salt mining areas, as previously mentioned. Although the specific site for Lamere's first report was not mentioned, perhaps it occurred on Buffalo Avenue, in the City of Niagara Falls, for there was a sign "Warning-Brine Pipeline-Do Not Dig." Such a brine pipeline is associated with the Oxidental Petroleum works, a multinational company that in 1978 had bought the original Hooker Chemical Company on Buffalo Avenue. The brine pipeline carries fresh water from Niagara Falls to a salt mining site inland and east of Niagara Falls.
within 60 miles. Such water is charged with a salt solution at the mine site and then pumped back to Buffalo Avenue where the salt is extracted and that compound, and that of water, is subjected to electrolysis to extract sodium and chlorine from the sodium-chloride for the manufacture of sodium hydroxide/caustic soda/lye, chlorine, and as a byproduct hydrogen (Thomas, 1955). One of the uses of the hydrogen is its attachment to liquid fats to make them solid for cooking in the conversion to such products as margarine and “Crisco.”

Voss (1996) attributed the first report of Solidago sempervirens from Michigan in 1987 to A. Reznicek (Michigan Botanist 19:26) and comments: “apparently spreading along expressways (saline habitat) and on fly ash deposits.” Perhaps with further botanical exploration, the Seaside Goldenrod may also be located at the mining sites of Detroit and other localities in Michigan, although the vector of salt-maintained highways was probably the source of the species which would find such mining sites suitable to it.

In the second article, we will present additional information regarding the biology of this Goldenrod, one of the most beautiful of the Goldenrod-kind, with notes on its distribution and collecting history at Niagara Falls and the City of Buffalo.

Literature Cited.


Lamere, Clifford W. Seaside Goldenrod (Solidago sempervirens L.) at Niagara Falls (NYFA Newsletter Col. 2(3): p. 4.


Solidago Sempervirens, Seaside Goldenrod

Britton & Brown, Illustrated Flora of the Northern United States & Canada & British Possessions, 1913