

HISTORICAL RECORDS OF THE RANGE OF OPUNTIA FRAGILIS

Root Gorelick reviews the recorded distribution of one of the most widespread and northerly distributed of all cacti.

The diminutive brittle prickly pear, *Opuntia fragilis* Haw., has one of the largest native ranges of any cactus, extending south to Arizona and west to islands in the Puget Sound and Strait of Georgia (Benson, 1982; Cota-Sánchez, 2002). Even more remarkable are that *O. fragilis* is found as far east as Ontario on islands in Lake of the Woods and as far north as the Peace River Valley in northern British Columbia and Alberta (Benson, 1982; Gorelick, 2015). A 1500km vicariant range extension to Kaladar, Ontario is also well-documented, but is probably an introduction by humans (Staniforth & Frego, 2000; Hancock, Darbyshire & Huntley, 2005).

My purpose here is to highlight that the northern range limit to the Peace River, the eastern range limit to Lake of the Woods, and the northwestern range limit to the Strait of Georgia have been documented for 130 years. While John Macoun (1883) mistook *Opuntia fragilis* for *O. polyacantha* Haw., which he called *O. missouriensis* DC. (the former name has priority), these two species are morphologically very similar, especially in colder climates where *O. polyacantha* tends to have smaller cladodes. These two species also hybridize in southern British Columbia as *O. x columbiana* Griffiths.

Regarding the northern range limit, Macoun (1883: 178) wrote:

A species which I believe to be the same, reappears again on the north bank of the Peace River, Lat. 56° 12', where it grows on the arid clay slopes, exposed often to a temperature of 55° below zero. It is found from Fort St. John to 50 miles below Dunvegan, or a distance of 150 miles.

This is remarkably close to the current northern range limit of the Cactaceae, at Fort St. John, at 56°17' N. Herbarium records exist for *Opuntia fragilis* at both Fort St. John, British Columbia and Dunvegan, Alberta (Gorelick, 2015). The range of this species extends 70km farther downstream (east-north-east) of Dunvegan to the eponymous town of Peace River, Alberta. It is not certain how recent this downstream range extension is, but the earliest herbarium specimen from the town of Peace River is from 1941, although there are herbarium records from almost 50km upstream on the Smokey River dating to 1903 (Gorelick, 2015). Moreover, *O. fragilis* is known to be able to survive movement by flooding rivers (Frego & Staniforth, 1985) hence its appearance in the town of Peace River is not surprising. Furthermore, fifty miles south of ("below") Dunvegan are the Kleskun Hills, from which herbarium specimens exist (Gorelick, 2015). Just south of the Kleskun Hills, near the town of Grand Prairie, the Peace River Grasslands end, being replaced by forests (Schmidt, Sperling & Macauley, 2014), hence the Peace River Valley population of *O. fragilis* is disjunct (Gorelick, 2015). *Opuntia fragilis* is very much a grassland species.

Macoun (1886) documented the eastern range of *Opuntia fragilis* at Lake of the Woods, in Ontario, near the Minnesota border at the only part of the continental United States north of the 49th parallel (due to an error at the end of the War of 1812, where negotiators mistakenly believed that Lake of the Woods was the headwaters of the Mississippi River). Macoun (1886: 532) wrote about *O. fragilis*:

Not uncommon on dry rocky islands in the Lake of the Woods, 1884. (A.G. Lawson.). This

then must be the plant referred to by Sir John Richardson as the 'prickly pear,' but which has not been detected within the last half century.

In the same passage, Macoun (1886) also documents the northwestern range of this species as extending to Hernando Island, in the Strait of Georgia. The northwestern-most herbarium record that I have found from the Strait of Georgia (no herbarium records exist for this species in Vancouver Island proper) was just a few kilometers north and west of Hernando Island, on Mitlenatch Island (Gorelick, 2015).

Overall, the range of *Opuntia fragilis* has not changed much in the past 130 years and/or we have not learned much more about its range in the intervening 130 years. This should give us confidence in future studies documenting range shifts in this species, especially as climate changes.

References

- BENSON, L.D. (1982) *The cacti of the United States and Canada*. Stanford University Press: Stanford.
- COTA-SÁNCHEZ, J.H. (2002) Taxonomy, distribution, rarity status and uses of Canadian cacti. *Haseltonia* 9: 17–25.
- FREGO, K.A., & STANIFORTH, R.J. (1985) Factors determining the distribution of *Opuntia*

fragilis in the boreal forest of southeastern Manitoba. *Canadian Journal of Botany-Revue Canadienne De Botanique* 63: 2377–2382.

- GORELICK, R. (2015) Northern range limit of *Opuntia fragilis* and the Cactaceae is 56°N, not 58°N. *Madroño* 62: 115–123.
- HANCOCK, K, DARBYSHIRE, S. & HUNTLEY, R. (2005) Canada's Kaladar cactus. *British Cactus and Succulent Journal* 23: 50–55.
- MACOUN, J. (1883) *Catalogue of Canadian plants: Part I – Polypetalæ*. Dawson Brothers: Montreal.
- MACOUN, J. (1886) *Catalogue of Canadian plants: Part III – Apetalæ*. Dawson Brothers: Montreal.
- SCHMIDT, B.C., SPERLING, F.A.H., & MACAULEY, A.D. (2014) Moths and butterflies (Lepidoptera) of the Peace River region: case study of a disjunct grassland fauna. In: GIBERSON, D.J. & CÁRCAMO, H.A. EDS. *Arthropods of Canadian grasslands (volume 4): Biodiversity and systematics. Part 2*. Ottawa: Biological Survey of Canada. 241–267.
- STANIFORTH, R.J. & FREGO, K.A. (2000) Ecological history and population dynamics of a disjunct population of brittle prickly-pear cactus, *Opuntia fragilis* (Cactaceae), in eastern Ontario. *Canadian Field-Naturalist* 114: 98–105.