Spineless *Opuntia fragilis*

In May 2019, I purchased *Opuntia fragilis* (debreczyi) var. *denuda*, from the vendor Cold Hardy Cactus, who noted that this plant is, “Typical of forms on the Colorado Plateau north into south-central Wyoming. Obtained it from Don Campbell.” This plant has globose to potato-shaped cladodes and a purple epidermis (Fig 1). As with all members of the Opuntiodieae that I have ever grown (except *Pereskopsis*), for the first few years, this plant of *Opuntia fragilis* (debreczyi) var. *denuda*, has only grown new roots with no above-ground growth. At least for me, opuntioids in cultivation don’t start growing new cladodes for 2–3 years, first investing in dense fibrous root systems. We have also recently had some winters when temperatures dropped to -30°C before an insulative blanket of snow fell. Note the rich purple colour from betalins, which will become even more purple in winter. Betalins help prevent UV damage when free radicals can cause the most harm on cold sunny days.

In May 2011, I purchased a clone of *Opuntia fragilis* (BCG16899), originally from Mt Kobau in British Columbia, which is about 12 km northwest of Osoyoos, as the crow flies, but a 30 km drive up switchbacks. This plant had the misfortune of spending a few years in the heated greenhouse at work, only to be uprooted and planted in my garden in Ottawa a few years later, in early 2013, only to be uprooted again and planted in my garden in North Kawartha in early 2016. Probably because of these disturbances, this plant has not grown much above ground over the years. But late in summer 2019, this plant of *O. fragilis* originally from Mt Kobau really took off, sprouting many new cladodes. Many of these were the spiny shoots that are typical of *O. fragilis*, but a few were almost spineless (Fig 2). And all new cladodes had the same distribution of purple pigments (betalins) as does *Opuntia fragilis* (debreczyi) var. *denuda*, with more and darker purple surrounding areoles, especially underneath areoles.

The spineless or almost spineless cladodes of *Opuntia fragilis* from Mt Kobau may eventually grow spines in subsequent years. Some opuntias do that, with indeterminate growth of their areoles. One difference between the two plants pictured herein is that

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1. *Opuntia fragilis* (debreczyi) var. *denuda.*
cladodes on the plant from Mt Kobau are only 2.5 cm in length, whereas those of O. fragilis (debreczyi) var. denuda are 3.8 cm in length, which is 50% longer, which translates into a 350% difference in volume. This size difference may possibly remain in subsequent years, insofar as shoot size tends to shrink for almost all cacti that I bring from indoor cultivation to unprotected outdoor cultivation in Canada. The cladodes from the Mt Kobau plant were larger when I first obtained them and when I first grew them in a heated greenhouse.

None of my many plants of Opuntia fragilis have ever flowered, at least not yet. So the spineless or almost spineless cladodes from Mt Kobau are not newly sprouted hybrid seedlings, hybridized with my other species of Opuntia that do flower. Plus cladodes with and without spines of the Mt Kobau plant all seem to be growing from the same chain of buried (underground) cladodes. This adds further evidence that Opuntia debreczyi Szutorisz should be considered an invalid name, although World Flora Online (www.WorldFloraOnline.org) considers this an ‘ambiguous name’. The combination Opuntia fragilis var. denuda should also be considered invalid, especially because it was seemingly never validly published. There is a validly published Opuntia fragilis var. denudata E.F. Wiegand & Backeberg, but that is a different epithet, which maybe should also should be subsumed under Opuntia fragilis var. fragilis.

Previously, I documented apparent clones of Opuntia fragilis in the San Juan Islands of Washington State in which the appearance of cladodes varied radically depending on the local environment in which they rooted (Gorelick, 2017). Cladodes that rooted in moss had an emerald green epidermis and robust spines. Cladodes that rooted in rockier crevices sometimes had an orange epidermis and some were virtually spineless. Opuntia fragilis is simply an incredibly wide-ranging species (Gorelick, 2015) with lots of developmental and phenotypic plasticity.

References