STUDIES IN THE COLORADO CACTI VI

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AN INTERESTING HYBRID *OPUNTIA* FROM SOUTHWESTERN COLORADO

In the addendum of Boissevain and Davidson's "Colorado Cacti" (1940, p. 71) it is mentioned that a population of *Opuntia arborescens* Engelm. (now referred to *Optunia imbricata* Haw.) is invading the western slope of Colorado at the foot of Wolf Creek Pass, near the Piedra River. If this were the case, then *Opuntia imbricata* would have to cross the Continental Divide which averages about 12,000 feet high in the area of Wolf Creek Pass or the population of *O. imbricata* was a relic of earlier times when the species might have ranged throughout the western slope of Colorado. A third possibility is that *O. imbricata* became established from seed or a branch transported across the divide by birds, mammals, or migrating tribes which have inhabited the area since time immemorial. Whatever the case, this population is the only known semiarborescent opuntia population on the western slope of Colorado so it was natural that I would want to visit and collect specimens as part of my studies. On 5 September, 1970 I visited the area and one glance suggested to me that these plants were not *Opuntia imbricata*. Analysis of the plants revealed a population of short (1 meter), densely branched opuntias with very brittle main branches. Each main branch was covered with masses of short secondary branches which remained on the plant for about five years without any further development after the first season's growth. The plants were prolific bloomers as evidenced by the numerous fruits topping all terminal joints. The plants, in fact, resembled the widespread *Opuntia whipplei* of the region and appeared to differ only in their strict upright habit as opposed to the very spreading habit of *Opuntia whipplei*. There were questions about these plants because the many fruits shriveled excessively on drying, the flowers were not known and, of course, all botanists acquainted with the plants referred them to *Opuntia imbricata* while, to me, they certainly resembled *Opuntia whipplei*.

The next year I returned in August (of 1971) and, with the assistance of S. G. Fagioli, was able to inspect the population closely and make the following observations.

While studying the colony in 1971 we found several plants in flower. These flowers were identical to *Opuntia imbricata* in color, as they were red-purple while those of *Opuntia whipplei* are yellow, yet the small flower size and shape was clearly that of *Opuntia whipplei*. On dissection of many of the hundreds of fruits contained on plants throughout the colony we found all to be sterile, with no seeds in the fleshy fruits. The plants themselves resemble dwarf *Opuntia imbricata* in shape yet they maintain the branching pattern of *O. whipplei*, in which many secondary joints are retained by the plant without again rebranching and the old branches are not shed from the main stem when older joints die. Of particular interest is the fact that the main branches of the plant are quite brittle which is the case with *O. whipplei* but not with *O. imbricata*.

Both *Opuntia whipplei* and *Opuntia imbricata* are found in Colorado but *O. imbricata*

Fig. 1. Habit photo of a young hybrid *Opuntia*, about 1 meter tall.

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Fig. 2. Closeup of older plant, showing the branching habit.

Fig. 3. Typical flowers and fruit of the hybrid *Opuntia*.

has never been collected on the western slope. It is, however, the only other cylindropuntia in the region. Since the colony of *Opuntia* under study is near a large number of ancient Indian dwellings one might speculate that perhaps some *O. imbricata* individual was brought in as a seed or otherwise. Also the immediate area has long been settled by ranchers, any of whom might have brought in a plant for his garden or for use in a living fence. Whatever, the case, I know of no *O. imbricata* known to persist in the area today.

In spite of the lack of one parent there seems to be little reason to suspect that at one time a plant of *O. imbricata* did not occur at this locality, hybridized with the local *O. whipplei* and produced a sterile hybrid offspring which continues to reproduce vegetatively. Table 1 contains a comparative analysis supporting the contention that the colony under consideration is a putative hybrid derivative of *Opuntia imbricata* and *Opuntia whipplei*.

The colony only occupies one hillside and numbers about 100 plants. Each plant stands about 1 meter tall and has four or more erect main stems bearing whorls of joints about every 10 cm. (fig. 1). The joints which form the whorls seldom rebranch and after three to four years they die but remain attached to the plant as also happens with *Opuntia whipplei* (fig. 2). Each terminal branch may bear five or more purple flowers 4 cm. in diameter in clusters at the end of each branch (fig. 3). Fruits were noted in such profusion that some plants held nearly one hundred fruits (fig. 4). The fruits remain green or yellow green and occasionally bear new flowers a second season so that chains of fruits result (fig. 5). Of the many fruits dissected, none bore embryos. Reproduction appears entirely vegetative, by fragmentation of the parent plant. Both *Opuntia whipplei* and the hybrid are quite brittle hence there is no difficulty in producing new propagules as any passing animal or heavy winter snow could break the main stems and disperse the plant.

Occasionally probable hybrid populations of cacti are given a separate name as has been occasionally done by Benson (1950, p. 48) and Grant and Grant (1971) but this population is so restricted in its distribution that there seems to be no good botanical reason why the hybrid should be named.

LITERATURE CITED

Benson, L. 1950. The Cacti of Arizona. 134 pages. University of Arizona Press, Tucson, Arizona.

Boissevain, C. and C. Davidson. 1940. Colorado Cacti. 74 pages. Abbey Garden Press, Pasadena, California.

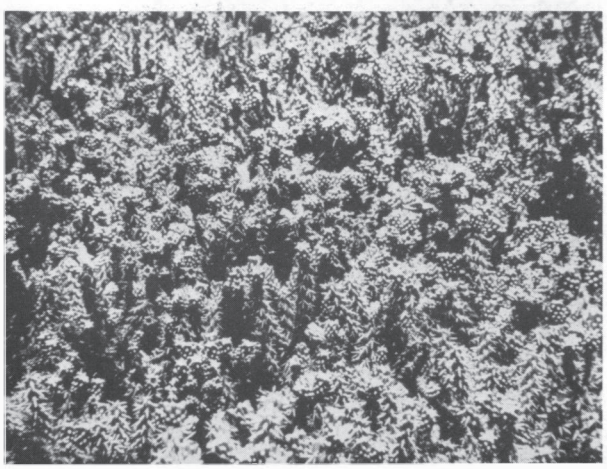

Fig. 4. View of a particularly robust portion of the hybrid *Opuntia* population.

Fig. 5. Hybrid *Opuntia* joint with proliferating fruits.