

Variations in *Opuntia humifusa* Occurring in New Jersey Strains Compared to Florida Strains: Leading to Possible Species Distinction[®]

H. William Barnes

Lorax Farms LLC, 2319 Evergreen Ave., Warrington, Pennsylvania 18976 U.S.A.

Email: loraxfarms@verizon.net

INTRODUCTION

Opuntia humifusa (Raf.) Raf., eastern prickly pear, is a wide-spread species occurring from Ontario south to Florida and west to the Eastern front range of the Rocky Mountains with the exception of Wyoming. It also occurs along the Great Lake States and goes north to Minnesota and South Dakota (United States Department of Agriculture: Natural Resources Conservation Service). *Opuntia humifusa* is one of the hardiest of the North American cacti and it is largely considered to have the widest spread of the Eastern U.S.A. cacti. Understandably there should be at least some regional variations.

In the commercial nursery trade at least in the Northeastern U.S.A. and Canada the more north eastern ecotype is most prevalent and could be reasonably considered here for the purposes of expediency, the New Jersey strain. From outward appearances there is very little variation of the natural form from New Jersey to those found further North. However, variation does occur as one moves South and West culminating in the lower Southeastern as the Florida strain. These names are not official and merely indicate locations of origin of the studied subjects.

New Jersey strains of *O. humifusa* growing in the open in Pennsylvania form large clusters of plants. The cladodes are nearly elongated with a slight tapering at the base and are about 14 cm long and 6 cm wide. There are no spines but plentiful occurrences of glochids. New leaves emerge in late spring and continue on till mid June where they become deciduous. All new growth stops at that point. Fruit is plentiful, turning a bright red in fall and measures 2.5 cm long by 1.5 cm in diameter. Flowers are 10 cm wide. They are bright yellow with a red center along the basal portions of the interior of the flower. Bloom time in Pennsylvania is the 2nd week of June.

The Florida strain growing within just a few feet of the Pennsylvania strain forms more upright clusters of cladodes, measuring 15 cm long by 4 cm wide. They are very spiny and spines occur in sets of two. One being 2.5 cm long and its companion is 1 cm long. Glochids are as prevalent in this strain as in the New Jersey strain. New leaves are red and often persist through out the summer months well into fall with new growth forming continuously into fall as well. Fruit is sparser and turns a dull red in fall. The fruit is a little smaller being 1.9 cm long and 1.1 cm wide. Flowers of the Florida strain are bright yellow and have no red pigment in the interior basal portions of the flower. Bloom time in Pennsylvania growing nearly adjacent to the New Jersey strain is a full 30 days later.

According to Forsyth and Miyata (1984) geographic speciation is a common means of specie formation. Plants from opposite ends of a large geographic spectrum often develop patterns of distinction that over long periods of time result in segregation of the two populations.

If this segregation is accentuated by geographic barriers such as water, mountains, deserts, or other geological formations, then the two forms may evolve to the point where they are no longer compatible in terms of reproduction. Often this incompatibility is accompanied by other outwardly noticeable features such as the evidence presented above. Changes in flower color could redirect pollinators so that there is a preference for one color as opposed to the other. The redirection could also influence which pollinators visit which flowers and in some cases pollinators have specific preferences and will ignore flowers of an offending color. The formation of spines on the Florida strain in comparison to the New Jersey strain is perhaps significant since the spines of a cactus often represent a mechanism for hitchhiking across large expanses of terrain. No spines generally would mean no hitchhiking abilities. Spines might also influence or deter specific herbivore predation, thereby changing the pattern of distribution as well.

While changes in spine formation, fruit size, and cladode characteristics are noticeable, a key change in the two types is the change of flower colors and the change in bloom time. Bloom time being the more significant of the two. By changing the bloom time, there is little chance of overlap for cross pollination of the two forms even when adjacent to one another. Also, specific pollinators may be present at one time and not so at another.

While these observations are cursory, there is an indication that the two readily identifiable ecotypes are segregating. Given enough time and with heretofore unknown environmental stresses and others such as the tropical cactus moth, there may come a time when the two ecotypes are so dissimilar that they could readily be reclassified as separate species. It is interesting to note that at present the Florida strain has the ability to withstand the cold temperatures of Pennsylvania, indicating that the tropical Florida strain migrated north into the outer reaches of the U.S.A. and Canada. This could be interpreted that many of the original genetics are still in place but the sheer number of variations between the two types point to possible species distinction. A further look at seed characteristics and germination requirements will also indicate possible species distinctions.

LITERATURE CITED

- United States Department of Agriculture: Natural Resources Conservation Service. Plant profile: *Opuntia humifusa* (Raf.) Raf. Devil's-tongue. <<http://plants.usda.gov/java/profile?symbol=OPHU>>
- Forsyth, A., and K. Miyata. 1984. Tropical nature, p. 199, Simon and Shuster, New York.