

Variation in the Genus *Hudsonia*

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Hudsonia, in the small family Cistaceae, contains three species all restricted to North America where they grow in sandy areas. These plants are small xerophytic shrubs, rather bushy with fine heath-like foliage, bearing leaves which are downy, small, sessile, appressed, persistent and alternate on the stems and bearing many bright-yellow flowers, borne singly at the ends of short branches. The most widely distributed species, *Hudsonia tomentosa* (commonly called Beach-heath), occurs from Nova Scotia south along the Atlantic coast to Virginia and west along lake-shores, river-banks, and sand-hills to northern Alberta and south to the southern shores of Lake Michigan and Lake Erie. *Hudsonia ericoides* (known as Golden-heather) is the type species and occurs in Newfoundland, Prince Edward Island, and along the Atlantic to Virginia. The most restricted species, *Hudsonia montana* apparently occurs only on Table Mountain in North Carolina.

On the sandy shores of Lake Pleasant, Hamilton Co., New York, Charles H. Peck, State Botanist of New York, in 1891 found a plant closely resembling *H. tomentosa*. He wrote in the New York State Museum Report, "The plants in their remarkably inland station differ so much from the typical form of the species that I am disposed to consider them a good variety. They are intermediate between *H. tomentosa* and *H. ericoides* and may therefore bear the name var. *intermedia*. Stems and branches more slender and longer; leaves narrow, less imbricating and less tomentose; flowers or pedicels mostly a little longer than the leaves."

Since Peck's description the var. *intermedia* has been found inland to the Great Lakes, to Lake Athabaska and the McKenzie Basin. I have made a survey of the area east of the Great Lakes, collecting population samples of *Hudsonia* in order to determine the distribution of var. *intermedia* and the nature of the variation within the species. Nearly 200 population samples, representing nearly 6,000 individuals, have been collected and are being analyzed by multiple correlation techniques, using four of the key characters. The basic trends seem quite clear.

I consider *Hudsonia tomentosa* var. *intermedia* to be a putative hybrid between *tomentosa typica* and *H. ericoides*. The variety shows recombinations of characters from both species. Their distribution supplies further evidence that the var. *intermedia* is an introgressant or backcross from hybridization. The two species, even though their ranges overlap in part, are ecologically isolated one from another. Wherever each grows separately, either species is very homogeneous; but where they grow together, each is very variable, and Peck's var. *intermedia* occurs abundantly along with other variants. In so far as I know, the two species occur together only in areas where man has made

changes which suited them. *Hudsonia tomentosa* typica grows only in open dune blowouts along the Atlantic coast, on the sand deposits of the St. Lawrence Gulf, and inland to Lake St. John, particularly, in areas characterized by halophytic plants such as *Ammophila breviligulata*, *Juncus balticus* var. *littoralis*, *Lathyrus japonicus* var. *glaber* and/or var. *pellitus*, and *Triglochin maritima*. *Hudsonia ericoides* grows in the sandy, acid, pine-lands well inland from the coastal dunes. The only places the species occur together are along open, sandy highway shoulders running between the coastal dunes and the pine-lands and here one finds many hybrids. From these "centers" of variability the var. *intermedia* becomes established in the pine-lands but not in the open dune blowouts.

The continental distribution of *Hudsonia*, that is around the Great Lakes to the McKenzie Basin, consists almost entirely of the var. *intermedia* which is found there in sandy pine-lands. In extensive open dune areas the typical variety may be found. It seems evident that var. *tomentosa*, endowed with a few genes of *ericoides*, was able to conquer a new habitat.

The origin of var. *intermedia* is probably not a recent development, i.e., since man built his coastal highways; but more likely in post-Pleistocene, as a result of glacial disturbances of the landscape, opportunity probably existed for these species to hybridize and for the new ecotype to become established.

This paper is based on the study of population samples and herbarium sheets collected throughout much of the range of the species. The data were analyzed by means of ordered value statistics. The means, their confidence limits, (95%), and standard deviations were obtained. Histograms and pictorialized scatter diagrams were made up from index values of five characters.