

THE COMPOSITION OF PRAIRIE VEGETATION IN ILLINOIS

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Although the prairie has had no small place in the interest of botanists since the early years of the nineteenth century, much of that interest has been speculation concerning its origin, its maintenance and the advance or retreat of forest along its borders. Early taxonomic studies were usually observations by travelers passing over the state, and by others whose primary interest was not in securing a technical and complete work on prairie composition, but more of a casual study of the outstanding species. In many instances specific names were not given or the common name only was used. Studies made later in the century were much improved. But many of these writers did not include habitat data with their species list. At the three-quarter mark in the last century, Illinois prairie soil was already mostly under the plow and virgin areas were mainly found in those flats that were most difficult to drain, along railroad rights of way and in sandy bottoms which were too poor for cultivation. Thus, before accurate data had been taken for a complete study, the prairie was no more. The only way a complete listing of species could be made was to collect all of the available lists which were made of local bits of prairie,

and to incorporate this material together with information obtained from herbarium study, into an inclusive annotated list.

Until Gleason wrote his thesis at the University of Illinois in 1901, no one had attempted to gather these loose ends together. His study was based on his own fairly comprehensive field data which were supplemented by the contributions of G. P. Clinton, H. V. Chase of Wady Petra, and Professor L. M. Umbach of Naperville. From the time Gleason made his study, up to the present, no one had attempted a similar study of the prairie.

The present work is based upon Gleason's list and other lists made by competent men in different sections of the State. Most of these lists were included in flora of particular counties or sections. In addition lists of smaller size or of certain families or groups were considered.

Due to the kindness of Dr. Tehon of the Illinois Natural History Survey, a catalogue of all plants of the State of Illinois was put at the writer's disposal. This catalogue was made up from specimens found in the herbaria at the Missouri Botanical Garden, The Field Museum, Northwestern University, Illinois

Normal University, The University of Illinois and the Natural History Survey collection.

Because of the availability of the catalogue the writer, in a comparatively short time, was able to go through all the material concerning the prairie to be found in these herbaria and to include data which otherwise could not have been included.

The various habitats of each species were noted, and as the list of counties in which each species had been found was given it was possible to determine a rating for frequency of distribution by counties; in some records abundance data were also available.

Early writers gave various estimates of the total number of species represented on the Illinois prairie. Most of the men placed the number at about two hundred. Gleason's total raised the number to four hundred fifteen. The present listing shows the probable number of prairie species to be half again as large.

The study brought some very interesting facts to light.

About 10% of the total number of species was found in sand prairie, and was found in no other type of habitat. This suggests the controlling effect sand has upon vegetation. No other prairie soil has such characteristic ground cover. Of course many other species grew in sand, but were also found on other types of soil, therefore could not be called characteristic of sand prairie.

The plasticity in water relations of prairie plants is shown by the varied situations in which the same species was to be found. About 30% of the total number was found only in xeric prairie conditions, 17% was found only in mesic conditions, and 6% in only hydric situations. (By hydric situations is meant those places such as stream borders, on the

margins of prairie swamps, etc.) Not aside from these more exacting species there were 24% found in both xeric and mesic habitats, 16% which were found in mesic and hydric habitats, 2 species were recorded in xeric and hydric extremes, and 7 species were found in all three types of habitat.

Twenty-three per cent of the total number of species were found also associated with woodland. This suggests that some few of these so-called prairie species are relics of former woodland vegetation which are able to persist in prairie. Probably many more than the 23 per cent recorded are plants which are equally at home in prairie and open forest, clearings or openings in forest land, or "barrens" of the eastern United States. In Gleason's later writings he has indicated that many prairie species were recruited from the flora of the deciduous forest region.

"Frequency" is not used in this work in the way it usually is in ecology: as indicating the percentage of place in one locality in which the species occurs. The term in this case is taken to mean the number of counties of Illinois in which the species appears in the collection records available. Those species which were recorded from three counties or fewer were designated as infrequent, those collected in from four to twelve counties were designated as occasional, and those found in more than twelve counties designated frequent.

Fifty-three per cent of the species were found to be frequent in Illinois counties, 36% were found to be occasional, and 11% were infrequent.

As might be expected, most of the additions to Gleason's list have been species with "occasional" or "infrequent" ratings. Of the "frequent" species, 70% appear in Gleason's list; of the occasional species, 33%; of the infrequent species, 26%.