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A Comparison of the Flora of Iowa With That of Alaska and Yukon

By J. P. ANDERSON

Iowa may be taken as a good example of a midtemperate climate although the northern part approaches a cold temperate condition. This, too, is indicated by the flora, as northeast Iowa has a much larger number of species characteristic of the northern regions than southern Iowa. Iowa is a land of comparatively little relief, ranging from a little less than 500 ft. at Keokuk to a little more than 1600 ft. at some places on the northern border.

The Pacific Coast region of Alaska from Cook Inlet east and south is an extension of the Pacific Forest belt. Between the Coast Ranges and the Brooks Range lies the valley of the Yukon, Kuskokwin, Copper and other rivers. Here we have the northern or boreal forests characterized by White Spruce, Black Spruce, birches, Aspen and Balsam Poplar, and in Yukon and east by the Lodgepole Pine. North of the Brooks Range along the arctic coast and extending along the Bering Sea littoral to the Alaska Peninsula and including the Aleutian Islands we have the tundra and tundra-like formation. In the boreal forest section, open places at the lower elevations are usually occupied by swampy areas usually filled with peat and moss and with stunted trees and shrubs. These areas are known as muskegs. They have some things in common with the tundra. At higher elevations some of these open places have a heath-like formation. In southern Yukon and extending into Alaska there are small stretches of prairie-like openings with many prairie characteristics. These have a tendency to extend farther north and west on dry hillsides. The topography is mostly mountainous and rugged and there are considerable areas above timber line which support an alpine and subalpine flora. The arctic and northern Bering Sea tundra is permanently frozen, thawing a few feet in the summer time. It supports a cover of grasses and grass-like plants with some plants of other aspect and dwarf shrubs and with an abundance of mosses. On the Alaska Peninsula and the Aleutians the subsoil is not frozen, but on account of the lack of forests is tundra-like or prairie-like in appearance. The vegetation is essentially that of a subalpine meadow. The July and August temperatures at Unalaska average scarcely 52 degrees F. In southeast Alaska the temperatures are 57 degrees or slightly warmer for the same months. In the Yukon valley the July temperatures are higher than along the coast and they have

almost continuous sunshine but the precipitation is rather light. Along the coast the precipitation is heavy giving rise to luxuriant vegetation.

It should be remembered that the farther north you go and the colder the climate the less varied the vegetation. In the arctic and subarctic vegetation a large proportion of the species tend to be circumpolar, though often of interrupted distribution or represented by local races or subspecies. The lessening of diversity and hence of the number of families and species represented is well illustrated by the comparisons in the following tables. These comparisons are mostly based on Cratty's Flora of Iowa and the writer's work on the Flora of Alaska and the adjacent parts of Canada. Alaska and Yukon combined have about 15 times the area of Iowa. Naturally the flora of these far northern regions is not so well known as that of Iowa. In the last four years the number of grasses known to occur in Alaska and Yukon has increased by 2 genera and 10 or 12 species. Tens of thousands of square miles have never been visited by a collector. The general aspect of the flora is now well known but there may be hundreds of the less common or widely distributed yet to be discovered in the region. It is doubtful if the flora of this far northern region will ever be as fully known as that of Iowa is today.

According to Cratty there are 121 families of vascular plants in Iowa. 67 of these are also represented in the far north. In addition the far north has 6 families not yet found in Iowa. The following table shows the likenesses and contrasts of the two floras.

Families	Iowa		Alaska & Yukon		Common	
	Gen.	Spp.	Genera	Species	Gen.	Spp.
<i>Ophioglossaceae</i>	1	4	2	6	1	1
<i>Osmundaceae</i>	1	3	0	0		
<i>Polypodiaceae</i>	15	28	12	28	11	10
<i>Salviniaceae</i>	1	1	0	0		
<i>Equisetaceae</i>	1	7	1	9	1	5
<i>Lycopodiaceae</i>	1	3	1	8	1	2
<i>Selaginellaceae</i>	1	1	1	2	1	0
<i>Isoetaceae</i>	0	0	1	1		
<i>Taxaceae</i>	1	1	1	1	1	0
<i>Pinaceae</i>	3	5	8	13	3	2
<i>Typhaceae</i>	1	1	1	1	1	1
<i>Sparganiaceae</i>	1	5	1	4	1	1
<i>Potamogetonaceae</i>	2	16	3	17	2	9
<i>Zosteraceae</i>	0	0	2	2		
<i>Najadaceae</i>	1	1	0	0		
<i>Juncaginaceae</i>	2	3	2	2	2	3
<i>Alismaceae</i>	4	9	1	1	1	1

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<i>Hydrocharitaceae</i>	2	2	0	0		
<i>Gramineae (Poaceae)</i>	61	170	37	165	28	34?
<i>Cyperaceae</i>	11	121	6	130	5	18?
<i>Araceae</i>	3	4	2	2	0	0
<i>Lemnaceae</i>	3	4	1	2	1	2
<i>Commelinaceae</i>	2	5	0	0		
<i>Ponteridaceae</i>	2	3	0	0		
<i>Juncaceae</i>	2	13	2	27	2	6
<i>Liliaceae</i>	18	35	11	18	5	4
<i>Amaryllidaceae</i>	2	5	0	0		
<i>Dioscoriaceae</i>	1	1	0	0		
<i>Iridaceae</i>	3	5	2	2	2	0
<i>Orchidaceae</i>	11	21	10	27	6	4
<i>Salicaceae</i>	2	25	2	40	2	6
<i>Juglandaceae</i>	2	8	0	0		
<i>Betulaceae</i>	5	11	2	8	2	2
<i>Fagaceae</i>	1	14	0	0		
<i>Ulmaceae</i>	2	5	0	0		
<i>Moraceae</i>	4	5	0	0		
<i>Urticaceae</i>	5	6	2	3	2	1
<i>Loranthaceae</i>	0	0	1	1		
<i>Santalaceae</i>	1	1	2	2	1	0
<i>Aristolochiaceae</i>	1	1	0	0		
<i>Polygonaceae</i>	4	34	4	31	2	12
<i>Chenopodiaceae</i>	6	18	6	16	2	3
<i>Amaranthaceae</i>	3	9	0	0		
<i>Nyctaginaceae</i>	1	3	0	0		
<i>Phytolacaceae</i>	1	1	0	0		
<i>Aizoaceae</i>	1	1	0	0		
<i>Portulacaceae</i>	3	4	2	12	1	0
<i>Caryophyllaceae</i>	8	21	10	50	6	7
<i>Nymphaceae</i>	4	5	3	3	3	1
<i>Ceratophyllaceae</i>	1	1	0	0		
<i>Ranunculaceae</i>	14	42	10	57	8	10
<i>Berberidaceae</i>	4	5	0	0		
<i>Memispermaceae</i>	1	1	0	0		
<i>Anonaceae</i>	1	1	0	0		
<i>Papaveraceae</i>	3	4	1	6	0	0
<i>Fumariaceae</i>	2	4	1	3	1	1
<i>Cruciferae (Brassicaceae)</i>	23	59	26	85	15	21
<i>Capperidaceae</i>	2	3	0	0		
<i>Resedaceae</i>	1	1	0	0		
<i>Crassulaceae</i>	2	2	1	3	1	0
<i>Saxifragaceae</i>	7	12	10	53	6	2
<i>Hamamelidaceae</i>	1	1	0	0		
<i>Platanaceae</i>	1	1	0	0		
<i>Rosaceae</i>	16	69	19	67	15	11
<i>Leguminosae in part</i> (<i>Fabaceae</i>)	31	78	9	62	8	12
<i>Geraniaceae</i>	2	5	2	5	2	3
<i>Oxalidaceae</i>	1	4	0	0		

<i>Linaceae</i>	1	3	1	1	1	0
<i>Zygophyllaceae</i>	1	1	0	0		
<i>Rutaceae</i>	2	2	0	0		
<i>Simarubaceae</i>	1	1	0	0		
<i>Polygalaceae</i>	1	4	0	0		
<i>Euphorbiaceae</i>	3	21	0	0		
<i>Callitrichaceae</i>	1	2	1	3	1	1
<i>Anachardiaceae</i>	1	6	0	0		
<i>Aquifoliaceae</i>	1	1	0	0		
<i>Celastraceae</i>	2	2	0	0		
<i>Staphylaceae</i>	1	1	0	0		
<i>Aceraceae</i>	1	5	1	2	1	0
<i>Hippocastinaceae</i>	1	2	0	0		
<i>Balsaminaceae</i>	1	2	1	1	1	0
<i>Rhamnaceae</i>	1	3	0	0		
<i>Vitaceae</i>	3	10	0	0		
<i>Tilliaceae</i>	1	1	0	0		
<i>Malvaceae</i>	8	12	0	0		
<i>Guttiferaceae</i>	2	10	0	0		
<i>Cistaceae</i>	2	4	0	0		
<i>Empetraceae</i>	0	0	1	1		
<i>Violaceae</i>	1	12	1	10	1	0
<i>Loasaceae</i>	1	1	0	0		
<i>Cactaceae</i>	1	2	0	0		
<i>Thymeliaceae</i>	1	1	0	0		
<i>Elaeagnaceae</i>	2	2	2	2	2	0
<i>Lythraceae</i>	5	5	0	0		
<i>Onagraceae</i>	6	16	2	14	1	1
<i>Haloragidaceae</i>	2	3	2	5	1	1
<i>Araliaceae</i>	2	3	2	2	1	1
<i>Umbelliferae (Ammiaceae)</i>	22	28	14	21	7	6
<i>Cornaceae</i>	2	3	2	2	1	1
<i>Pyrolaceae</i>	3	4	5	9	3	3
<i>Ericaceae</i>	2	3	14	31	1	0
<i>Diapensiaceae</i>	0	0	1	1		
<i>Primulaceae</i>	5	9	7	23	4	2
<i>Plumbaginaceae</i>	0	0	1	1		
<i>Oleaceae</i>	1	5	0	0		
<i>Gentianaceae</i>	3	9	5	17	2	2
<i>Apocynaceae</i>	1	5	1	1	1	1
<i>Asclepiadaceae</i>	3	16	0	0		
<i>Convolvulaceae</i>	4	18	0	0		
<i>Polemoniaceae</i>	4	9	5	8	3	1
<i>Hydrophyllaceae</i>	2	3	2	5	0	0
<i>Boraginaceae</i>	7	20	9	20	3	3
<i>Labiatae (Lamiaceae)</i>	20	47	9	11	9	7
<i>Solonaceae</i>	5	23	0	0		
<i>Scrophulariaceae</i>	20	47	14	52	7	6
<i>Bignoniaceae</i>	1	1	0	0		
<i>Martyniaceae</i>	1	1	0	0		
<i>Orobanchiaceae</i>	1	2	2	3	1	2

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<i>Lentibulariaceae</i>	1	3	2	5	1	3
<i>Acanthaceae</i>	2	3	0	0		
<i>Phrymaceae</i>	1	1	0	0		
<i>Plantaginaceae</i>	1	7	1	6	1	3
<i>Rubiaceae</i>	4	14	1	6	1	4
<i>Caprifoliaceae</i>	7	19	5	7	5	1
<i>Adoxaceae</i>	1	1	1	1	1	1
<i>Valerianiaceae</i>	1	1	1	2	1	0
<i>Cucurbitaceae</i>	2	2	0	0		
<i>Campanulaceae</i>	3	10	2	6		

In the grasses all the northern species belong to the subfamily *Festucoideae*, there is not even an introduced species of the *Panicoidae*. In the legumes the *Mimosaceae* and *Caesalpinaceae*, both represented in Iowa are absent in the far north. The composites do not appear in the above list. I have not yet been able to determine how many are found in the far north. For instance, in the genus *Taraxicum* numerous species have been described. How many of these should be considered good species will require much study. I suspect that many of these are merely apomictic lines. Though they may be distinguishable the differences are not sufficient to constitute species, at least not in any broad sense.

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