

RARE AND INFREQUENT PLANT SPECIES IN THE OAK OPENINGS OF NORTHWESTERN OHIO¹

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Abstract. Frequency of occurrence changes are cited for 154 rare and infrequent taxa of herbaceous vascular plants listed by Edwin L. Moseley in 1928. Of these taxa, approximately 47% are less frequent now (1978) than 50 years ago. Twenty-six percent exhibit the same frequency of occurrence and 27% are more frequent than they were 50 years ago. Approximately 50% of these rare and infrequent taxa are widespread in distribution, 35% are northern, 7.5% are southern, 6% are western and 3% are originally from the Atlantic Coastal Plain. One hundred thirteen new taxa are cited that were not reported by Moseley 50 years ago.

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In the western part of Lucas County, Ohio lie the "oak openings" of northwestern Ohio. These sandy habitats probably had their origin in the ancient Glacial Lake Warren. The sand deposits were laid down as a beach, or as submerged sand bars, or both (Forsyth 1968). Professor Edwin L. Moseley outlined the border of the oak openings in 1927 and published an annotated checklist of the vascular plant species growing within the 130 square mile sand deposit (Moseley 1928). The undulating topography of the oak openings provided for a high dry habitat with *Quercus velutina* Lam. as the predominant woody plant, and for a low wet habitat with sedges and grasses as the predominant species. Today, much of the original study area has been modified by home site development, agricultural practices, and the establishment of commercial enterprises. The high dry habitat is best preserved in Swanton Township in the 3600-acre Oak Openings Metropolitan Park, managed by the Toledo Metropark District. The low wet habitat is best preserved in Spencer Township in the Irwin Prairie and in Schwamberger Preserve. These habitats serve as a refuge for many rare and infrequent plant species.

Moseley (1928) was interested in the distribution of the species as well as the frequency of occurrence. He compared the flora of the oak openings to the Michigan flora and mentioned some northern species whose southern range extended no further than northern Ohio. Donald Culross Peattie (1922) also mentioned some of the rare plants in northern Ohio and discussed the distribution of coastal plain species in the flora of the Great Lakes.

MATERIALS AND METHODS

Two hundred sixty-seven species or varieties are listed in Table 4 with comments concerning frequency of occurrence and distribution patterns. Voucher specimens are preserved for each taxon in the herbarium at Bowling Green State University. Field collections and notations supporting the study have been recorded since 1966. Moseley's (1928) frequency of occurrence code has been used throughout the study for accurate comparison (Table 1). Frequency of occurrence changes during the past 50 years are summarized in Table 3. If the distribution range of the species is primarily in northeastern United States and Canada, the distribution pattern is listed as northern. Species whose distribution ranges are primarily in southeastern United States are listed as southern; those with distribution patterns near the Mississippi River and westward are listed as western. The coastal plain species are cited by Dennis Murray Anderson (1971) in his study of northwestern Ohio prairie remnants. All other species are generally widespread throughout eastern United States. The distribution data are summarized in Table 2.

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TABLE 1
Moseley's Frequency of Occurrence Code.

Descriptive Term	Definition of the Term
Rare —	plants observed in less than five places
Scarce —	plants observed in less than fifteen places
Infrequent —	plants observed several times during one day in the right season
Frequent —	a few thousand plants observed per square mile
Common —	many thousands of plants observed per square mile
Abundant —	hundreds of thousands of plants observed per square mile
Local —	many plants observed in a few places, but elsewhere few or none
No comment —	plants were known to occur in the oak openings, but were seldom seen by the author (Moseley, 1928)
No report —	plants were not reported (Moseley, 1928)

DISCUSSION

In his study of the oak openings flora, Moseley (1928) paid much attention to the frequency of occurrence of the species. He listed 102 species that were more common in the sandy habitats of the oak openings than in the remainder of Ohio. Many of these species are cited in the

present list as being rare and infrequent. Other species in Moseley's list grow commonly in the preserved habitats of the oak openings. At the present time, approximately 26% of the rare and infrequent species listed both by Moseley (1928) and by the present author (Table 3) have shown no change in frequency during the past 50 years. Approximately 47% of the species, as cited by Moseley, are less frequent; 27% are more frequent. Although specific reasons are not definitely known for changes in frequency, destruction of the habitat brought about by drainage changes probably accounts for the decrease in abundance. While some species have decreased in abundance, other species such as *Lycopodium complanatum* L. have increased in abundance where pines have been planted by the forest rangers to cover barren areas of the Oak Openings Metropolitan Park. Wider coverage of the study area has been made during the present investigation and may account for some of the increase in frequency. Moseley (1928) does state that he was unfamiliar with the northwestern portion of the oak openings. Other problems of comparison are concerned with Moseley's lack of voucher specimens and his lack of data placed on the herbarium labels. Some new species undoubtedly have entered into the area along roadsides and

TABLE 2
Range of Distribution.

	Total Plants	Widespread	Northern	Southern	Western	Coastal
No.	267	133	92	20	15	7
%	100	49.8	34.5	7.5	5.6	2.6

TABLE 3
Frequency of Occurrence Changes (1928-1978).

	Total Easterly 1978	Total Moseley 1928	Frequency Since Moseley's 1928 Report			New Reports
			Less	Same	More	
No.	267	154	73	40	41	113
%			47.4	26.0	26.6	42.3

railroads since Moseley's study, but most of the 113 new reports listed in Table 3 are there because investigation was more intensive during the present study. Some species, such as *Artemisia ludoviciana* Nutt. (not reported by Moseley), now are growing aggressively in the sandy habitats and will continue to increase in frequency.

Moseley (1928) mentioned some species of plants that were known to occur in the oak openings before the time of his investigation, and were thought to be extinct. These taxa were not found during the present investigation: *Asclepias viridiflora* Raf. var. *lanceolata* (Ives) Torr., *Cypripedium candidum* Willd., *Filipendula rubra* (Hill) Robins., *Gentiana puberula* Michx., *Lechea minor* L. and *Liparis liliifolia* (L.) Lindley. Louis Campbell (1946) of the Toledo Naturalists' Association, believes that *Filipendula rubra* was cultivated in former times. Moseley believes that *Gentiana puberula* was brought in by the Indians.

Approximately 50% of the rare and infrequent plants of the oak openings were widespread in distribution (Table 2). This corresponds to a study by Parker (1936) concerning the distribution patterns of the flora of Indiana. In that

study she stated that 60% of the Indiana flora is widespread. In his study dealing with the vegetational history of the middle west, Gleason (1922) mentioned 5 centers of plant migration; (1) southern Appalachian Mountains, (2) southern coastal plain and Mississippian embayment, (3) Ozark Mountains, (4) the plains of Kansas and Nebraska, and (5) Canada. At the present time, there are plant species from each of the 5 distribution centers growing in the oak openings habitats. Approximately 35% of the species listed in this paper are northern or have northern affinities (Table 2). Only 7.5% have southern distribution patterns. The moderating influence of the Great Lakes may help maintain the populations of southern species. 5.6% of the rare and infrequent species have western distribution patterns. One of the best examples is *Asclepias hirtella* (Pennell) Woodson, whose range extends from Ohio southwest into Kansas, Oklahoma and Arkansas. Only 2.6% of the species originated in the atlantic coastal plain. One good example here is *Cladium mariscoides* (Muhl.) Torr., a species that totally dominates the wet sedge meadow at Irwin Prairie in Spencer Township.

TABLE 4
Rare and Infrequent Plants of the Oak Openings.*

Name	Moseley (1928)	Easterly (1978)	Distribution
<i>Equisetum fluviatile</i> L.	no report	infrequent	northern
<i>Equisetum variegatum</i> Schleich. var. <i>nelsoni</i> A. A. Eat.	no comment no report	infrequent rare	northern northern
<i>Lycopodium clavatum</i> L.			
<i>Lycopodium complanatum</i> L. var. <i>flabelliforme</i> Fern.	rare	infrequent	widespread
<i>Lycopodium inundatum</i> L.	rare	rare	northern
<i>Lycopodium lucidulum</i> Michx.	rare	rare	northern
<i>Lycopodium obscurum</i> L.	no report	rare	widespread
<i>Botrychium dissectum</i> Spreng.	no report	rare	northern
<i>Botrychium matricariaefolium</i> A. Br.	no report	rare	northern
<i>Botrychium multifidum</i> (Gmel.) Rupr. var. <i>intermedium</i> (D. C. Eat.) Farwell	rare	rare	northern
<i>Botrychium simplex</i> E. Hitch.	no report	rare	northern
<i>Botrychium virginianum</i> (L.) Sw.	scarce	infrequent	widespread
<i>Ophioglossum vulgatum</i> L. var. <i>pseudopodium</i> (Blake) Farw.	rare	no report	widespread
<i>Adiantum pedatum</i> L.	rare	rare	widespread
<i>Asplenium platyneuron</i> (L.) Oakes	no report	rare	southern
<i>Cystopteris fragilis</i> (L.) Bernh.	no report	infrequent	northern
<i>Dryopteris carthusiana</i> (Villars) H. P. Fuchs	infrequent	infrequent	widespread
<i>Dryopteris cristata</i> (L.) Gray	no report	rare	widespread
<i>Polystichum acrostichoides</i> (Michx.) Schott	no report	infrequent	widespread
<i>Typha angustifolia</i> L.	common	infrequent	widespread

*Classification according to Fernald (1950), Gleason and Cronquist (1963), and Voss (1972).

TABLE 4. *Continued.*

Name	Mosley (1928)	Easterly (1978)	Distribution
<i>Typha latifolia</i> L.	common	scarce	widespread
<i>Sparganium americanum</i> Nutt.	local	rare	widespread
<i>Potamogeton foliosus</i> Raf.	local	rare	widespread
<i>Potamogeton nodosus</i> Poir.	local	infrequent	widespread
<i>Zannichellia palustris</i> L.	no report	infrequent	northern
<i>Alisma plantago-aquatica</i> L.	common	infrequent	widespread
<i>Sagittaria graminea</i> Michx.	rare	infrequent	widespread
<i>Andropogon virginicus</i> L.	no report	infrequent	southern
<i>Aristida longispica</i> Poir.	no report	infrequent	southern
<i>Bromus kalmii</i> Gray	infrequent	infrequent	northern
<i>Calamagrostis inexpansa</i> Gray			
var. <i>brevior</i> (Vasey) Stebbins	common	infrequent	northern
<i>Calamovilfa longifolia</i> (Hook.) Scribn.			
var. <i>magna</i> Scribn. & Merr.	no report	rare	northern
<i>Cinna arundinacea</i> L.	infrequent	infrequent	widespread
<i>Elymus virginicus</i> L.	no comment	infrequent	widespread
<i>Eragrostis capillaris</i> (L.) Nees	no report	rare	widespread
<i>Eragrostis hypnoides</i> (Lam.) BSP.	no report	rare	widespread
<i>Festuca octoflora</i> Walt.	rare	infrequent	southern
<i>Glyceria canadensis</i> (Michx.) Trin.	infrequent	infrequent	northern
<i>Hierochloa odorata</i> (L.) Beauv.	no report	rare	northern
<i>Hystrix patula</i> Moench	rare	rare	widespread
<i>Leersia virginica</i> Willd.	local	infrequent	widespread
<i>Panicum linearifolium</i> Britt.	no report	rare	southern
<i>Paspalum ciliatifolium</i> Michx.	infrequent	infrequent	southern
<i>Poa languida</i> Hitchc.	no report	infrequent	northern
<i>Poa palustris</i> L.	no comment	rare	northern
<i>Sporobolus cryptandrus</i> (Torr.) Gray	near RR.	infrequent	northern
<i>Sporobolus vaginiflorus</i> (Torr.) Wood	no comment	rare	widespread
<i>Carex aggregata</i> Mack.	no report	rare	southern
<i>Carex abbotlescens</i> Schwein.	no report	rare	coastal plain
<i>Carex amphibola</i> Steud.			
var. <i>turgida</i> Fern.	no report	infrequent	widespread
<i>Carex annectans</i> Bickn.			
var. <i>xanthocarpa</i> (Bickn.) Wieg.	no report	rare	northern
<i>Carex bicknellii</i> Britt.	no report	rare	northern
<i>Carex cephalophora</i> Willd.	no report	infrequent	southern
<i>Carex communis</i> Bailey	no report	rare	northern
<i>Carex conoidea</i> Willd.	frequent	rare	northern
<i>Carex convoluta</i> Mack.	no report	rare	widespread
<i>Carex cristatella</i> Britt.	no report	infrequent	northern
<i>Carex davisii</i> Schwein. & Torr.	no report	rare	northern
<i>Carex emmonsii</i> Dewey	no report	infrequent	southern
<i>Carex gracilescens</i> Steud.	no report	infrequent	widespread
<i>Carex gracillima</i> Schwein.	scarce	scarce	northern
<i>Carex hystericina</i> Willd.	local	infrequent	northern
<i>Carex interior</i> Bailey	no report	rare	northern
<i>Carex intumescens</i> Rudge	no report	rare	widespread
<i>Carex lacustris</i> Willd.	scarce	scarce	northern
<i>Carex leavenworthii</i> Dewey	no report	rare	southern
<i>Carex longii</i> Mack.	no report	rare	widespread
<i>Carex lupulina</i> Willd.	not in O.O.	rare	northern
<i>Carex rosea</i> Willd.	scarce	scarce	widespread
<i>Carex sparganioides</i> Willd.	no report	rare	northern
<i>Carex stricta</i> Lam.			
var. <i>strictior</i> (Dewey) Carey	frequent	rare	northern
<i>Carex tetanica</i> Schkuhr	local	local	northern
<i>Carex trichocarpa</i> Schkuhr	no report	rare	northern
<i>Cladium mariscoides</i> (Muhl.) Torr.	rare	local	coastal plain
<i>Cyperus esculentus</i> L.	no comment	infrequent	widespread
<i>Dulichium arundinaceum</i> (L.) Britt.	no comment	rare	widespread
<i>Eleocharis smallii</i> Britt.	no report	infrequent	northern
<i>Fimbristylis autumnalis</i> (L.) R. & S.	common	infrequent	coastal plain
<i>Hemicarpha micrantha</i> (Vahl) Pax	no report	rare	widespread

TABLE 4. *Continued.*

Name	Mosley (1928)	Easterly (1978)	Distribution
<i>Rhynchospora globularis</i> (Chap.) Small			
var. <i>recognita</i> Gale	infrequent	rare	southern
<i>Scirpus acutus</i> Bigelow	no report	infrequent	northern
<i>Scirpus americanus</i> Pers.	no report	rare	widespread
<i>Scirpus hattorianus</i> Mak.	no report	infrequent	northern
<i>Scleria pauciflora</i> Willd.			
var. <i>caroliniana</i> (Willd.) Wood	frequent	infrequent	southern
<i>Arisaema dracontium</i> (L.) Schott	no report	rare	southern
<i>Xyris torta</i> Sm.	scarce	infrequent	southern
<i>Juncus bufonius</i> L.	rare	rare	widespread
<i>Juncus greenei</i> Oakes & Tuckerm.	no report	rare	coastal plain
<i>Juncus marginatus</i> Rostk.	common	infrequent	widespread
<i>Allium canadense</i> L.	no report	infrequent	widespread
<i>Allium cernuum</i> Roth	no report	infrequent	northern
<i>Lilium philadelphicum</i> L.			
var. <i>andinum</i> (Nutt.) Ker	infrequent	infrequent	northern
<i>Polygonatum biflorum</i> (Walt.) Ell.	frequent	infrequent	widespread
<i>Polygonatum pubescens</i> (Willd.) Pursh	frequent	infrequent	northern
<i>Smilacina stellata</i> (L.) Desf.	frequent	rare	northern
<i>Trillium flexipes</i> Raf.	no report	rare	widespread
<i>Sisyrinchium atlanticum</i> Bicknell	no report	infrequent	southern
<i>Calopogon pulchellus</i> R. Br.	scarce	infrequent	widespread
<i>Cypripedium calceolus</i> L.			
var. <i>pubescens</i> (Willd.) Correll	scarce	scarce	widespread
<i>Habenaria ciliaris</i> (L.) R. Br.	scarce	rare	southern
<i>Habenaria lacera</i> (Michx.) Lodd.	rare	rare	widespread
<i>Habenaria psycodes</i> (L.) Spreng.	scarce	rare	northern
<i>Pogonia ophioglossoides</i> (L.) Ker	no report	rare	coastal plain
<i>Humulus lupulus</i> L.	scarce	rare	northern
<i>Parietaria pennsylvanica</i> Muhl.	no report	rare	widespread
<i>Polygonum coccineum</i> Muhl.	frequent	infrequent	northern
<i>Polygonum erectum</i> L.	no report	rare	widespread
<i>Polygonum hydropiperoides</i> Michx.	common	infrequent	widespread
<i>Polygonum tenue</i> Michx.	common	infrequent	widespread
<i>Polygonum virginianum</i> L.	rare	infrequent	widespread
<i>Rumex altissimus</i> Wood	one place	infrequent	widespread
<i>Chenopodium stanleyanum</i> Aellen	no report	rare	widespread
<i>Cycloloma atriplicifolium</i> (Spreng.) Coult.	scarce	rare	western
<i>Amaranthus albus</i> L.	common	infrequent	widespread
<i>Mirabilis nyctaginea</i> (Michx.) MacM.	no report	infrequent	western
<i>Arenaria lateriflora</i> L.	no report	rare	northern
<i>Paronychia canadensis</i> (L.) Wood	infrequent	infrequent	widespread
<i>Silene antirrhina</i> L.	frequent	infrequent	widespread
<i>Actaea pachypoda</i> Ell.	one place	rare	widespread
<i>Actaea rubra</i> (Ait.) Willd.	rare	rare	northern
<i>Anemonella thalictroides</i> (L.) Spach	no report	infrequent	widespread
<i>Caltha palustris</i> L.	infrequent	infrequent	northern
<i>Hepatica americana</i> (DC.) Ker	rare	infrequent	widespread
<i>Hydrastis canadensis</i> L.	no report	rare	widespread
<i>Ranunculus flabellaris</i> Raf.	local	rare	widespread
<i>Ranunculus pensylvanicus</i> L. f.	scarce	infrequent	northern
<i>Ranunculus recurvatus</i> Poir.	no report	rare	widespread
<i>Podophyllum peltatum</i> L.	no report	infrequent	widespread
<i>Arabis canadensis</i> L.	scarce	infrequent	widespread
<i>Arabis glabra</i> (L.) Bernh.	no report	infrequent	northern
<i>Arabis hirsuta</i> (L.) Scop.			
var. <i>pycnocarpa</i> (Hopkins) Rollins	no report	rare	northern
<i>Arabis laevigata</i> (Muhl.) Poir.	no report	infrequent	widespread
<i>Cardamine bulbosa</i> (Schreb.) BSP.	frequent	rare	northern
<i>Cardamine douglassii</i> (Torr.) Britt.	no report	infrequent	northern
<i>Cardamine pensylvanica</i> Muhl.	frequent	rare	widespread
<i>Descurainia pinnata</i> (Walt.) Britt.			
var. <i>brachycarpa</i> (Richards.) Fern.	no report	infrequent	northern
<i>Erysimum inconspicuum</i> (Wats.) MacM.	no report	infrequent	northern
<i>Drosera intermedia</i> Hayne	one place	rare	northern

TABLE 4. *Continued.*

Name	Moseley (1928)	Easterly (1978)	Distribution
<i>Drosera rotundifolia</i> L.	scarce	rare	widespread
<i>Heuchera americana</i> L.	frequent	infrequent	widespread
<i>Parnassia glauca</i> Raf.	rare	rare	northern
<i>Agrimonia parviflora</i> Ait.	common	infrequent	widespread
<i>Agrimonia pubescens</i> Wallr.	no report	infrequent	widespread
<i>Amphicarpa bracteata</i> (L.) Fern.			
var. <i>comosa</i> (L.) Fern.	rare	infrequent	northern
<i>Cassia fasciculata</i> Michx.	scarce	rare	widespread
<i>Cassia hebecarpa</i> Fern.	local	infrequent	northern
<i>Desmodium cuspidatum</i> (Muhl.) Loud.			
var. <i>longifolium</i> (T. & G.) Schub.	no report	infrequent	widespread
<i>Desmodium glutinosum</i> (Muhl.) Wood	infrequent	rare	widespread
<i>Desmodium nudiflorum</i> (L.) DC.	infrequent	infrequent	widespread
<i>Desmodium rigidum</i> (Ell.) DC.	frequent	rare	widespread
<i>Desmodium sessilifolium</i> (Torr.) T. & G.	frequent	infrequent	northern
<i>Lathyrus ochroleucus</i> Hook.	no report	rare	northern
<i>Lathyrus palustris</i> L.			
var. <i>myrtifolius</i> (Muhl.) Gray	infrequent	rare	widespread
<i>Lespedeza hirta</i> (L.) Hornem.	common	infrequent	widespread
<i>Lespedeza repens</i> (L.) Bart.	no report	infrequent	southern
<i>Geranium carolinianum</i> L.	infrequent	scarce	widespread
<i>Polygala cruciata</i> L.			
var. <i>aquilonia</i> Fern. & Schub.	local	infrequent	coastal plain
<i>Polygala paucifolia</i> Willd.	no report	rare	northern
<i>Acalypha virginica</i> L.	no report	rare	southern
<i>Hypericum canadense</i> L.	infrequent	infrequent	widespread
<i>Hypericum majus</i> (Gray) Britt.	frequent	infrequent	northern
<i>Hypericum virginicum</i> L.			
var. <i>fraseri</i> (Spach) Fern.	scarce	rare	northern
<i>Helianthemum bicknellii</i> Fern.	common	infrequent	northern
<i>Lechia leggettii</i> Britt. & Holl.			
var. <i>moniliformis</i> (Bickn.) Hodgdon	abundant	infrequent	northern
<i>Viola affinis</i> LeConte	no report	infrequent	widespread
<i>Viola blanda</i> Willd.	frequent	infrequent	northern
<i>Viola incognita</i> Brainerd			
var. <i>forbesii</i> Brainerd	no report	infrequent	northern
<i>Viola lanceolata</i> L.	infrequent	infrequent	widespread
<i>Viola pedata</i> L.			
var. <i>lineariloba</i> DC.	infrequent	infrequent	widespread
<i>Viola rostrata</i> Pursh	rare	rare	northern
<i>Opuntia humifusa</i> Raf.	no report	infrequent	widespread
<i>Rotala ramosior</i> (L.) Koehne	no report	infrequent	coastal plain
<i>Epilobium coloratum</i> Biehler	no report	infrequent	widespread
<i>Epilobium leptophyllum</i> Raf.	rare	rare	northern
<i>Ludwigia polycarpa</i> Short & Peter	frequent	rare	northern
<i>Oenothera parviflora</i> L.	one place	rare	northern
<i>Aralia racemosa</i> L.	no report	rare	widespread
<i>Angelica venenosa</i> (Greenway) Fern.	frequent	infrequent	widespread
<i>Eryngium yuccifolium</i> Michx.	scarce	rare	western
<i>Sanicula marilandica</i> L.	rare	infrequent	northern
<i>Sium suave</i> Walt.	no report	rare	widespread
<i>Thaspium barbinode</i> (Michx.) Nutt.	no report	rare	widespread
<i>Monotropa uniflora</i> L.	scarce	infrequent	widespread
<i>Gaultheria procumbens</i> L.	abundant	infrequent	widespread
<i>Lysimachia lanceolata</i> Walt.	frequent	infrequent	widespread
<i>Lysimachia quadriflora</i> Sims	no report	infrequent	northern
<i>Lysimachia terrestris</i> (L.) BSP.	no report	infrequent	northern
<i>Samolus parviflorus</i> Raf.	no report	infrequent	widespread
<i>Bartonia virginica</i> (L.) BSP.	common	rare	widespread
<i>Gentiana andrewsii</i> Griseb.	frequent	scarce	widespread
<i>Gentiana crinita</i> Froel.	local	local	northern
<i>Apocynum cannabinum</i> L.	common	infrequent	widespread
<i>Asclepias amplexicaulis</i> Sm.	scarce	infrequent	widespread
<i>Asclepias hirtella</i> (Pennell) Woodson	infrequent	infrequent	western
<i>Asclepias purpurascens</i> L.	no report	infrequent	widespread

TABLE 4. *Continued.*

Name	Moseley (1928)	Easterly (1978)	Distribution
<i>Asclepias syriaca</i> L.	common	infrequent	widespread
<i>Asclepias tuberosa</i> L.	common	infrequent	widespread
<i>Asclepias verticillata</i> L.	rare	rare	widespread
<i>Convolvulus spithameus</i> L.	no report	infrequent	northern
<i>Cuscuta cephalanthi</i> Engelm.	no comment	rare	northern
<i>Phlox pilosa</i> L.	abundant	infrequent	widespread
<i>Hydrophyllum virginianum</i> L.	no report	rare	northern
<i>Lithospermum croceum</i> Fern.	common	infrequent	southern
<i>Verbena bracteata</i> Lag. & Rodr.	rare	infrequent	western
<i>Verbena stricta</i> Vent.	no report	infrequent	western
<i>Agastache nepetoides</i> (L.) Ktze.	rare	infrequent	widespread
<i>Collinsonia canadensis</i> L.	no report	rare	widespread
<i>Hedeoma hispida</i> Pursh	no report	rare	northern
<i>Lycopus uniflorus</i> Michx.	no report	rare	northern
<i>Pycnanthemum pilosum</i> Nutt.	no report	infrequent	western
<i>Pycnanthemum tenuifolium</i> Schrad.	no report	infrequent	widespread
<i>Scutellaria epilobiifolia</i> A. Hamilton	common	infrequent	northern
<i>Physalis heterophylla</i> Nees	frequent	infrequent	northern
<i>Physalis subglabrata</i> Mack. & Bush	no report	infrequent	widespread
<i>Castilleja coccinea</i> (L.) Spreng.	infrequent	rare	widespread
<i>Chelone glabra</i> L.	frequent	infrequent	widespread
<i>Conoclea multifida</i> (Michx.) Benth.	no report	rare	western
<i>Gerardia flava</i> L.	frequent	infrequent	widespread
<i>Gerardia pedicularia</i> (L.) Raf. var. <i>ambigens</i> Fern.	frequent	infrequent	northern
<i>Gerardia skinneriana</i> Wood	no report	rare	western
<i>Gerardia tenuifolia</i> Vahl	no report	infrequent	widespread
<i>Gnaphalium neglecta</i> Torr.	no report	infrequent	widespread
<i>Lindernia anagallidea</i> (Michx.) Pennell	no report	scarce	widespread
<i>Lindernia dubia</i> (L.) Pennell var. <i>riparia</i> (Raf.) Fern.	rare	rare	widespread
<i>Melampyrum lineare</i> Lam. var. <i>latifolium</i> Bart.	infrequent	infrequent	northern
<i>Pedicularis lanecolata</i> Michx.	frequent	infrequent	northern
<i>Penstemon hirsutus</i> (L.) Willd.	no report	infrequent	northern
<i>Veronica comosa</i> Richter	rare	infrequent	widespread
<i>Veronicastium virginicum</i> (L.) Farw.	no report	infrequent	widespread
<i>Conopholis americana</i> (L.) Wallr.	no report	rare	widespread
<i>Justicia americana</i> (L.) Vahl	no report	rare	widespread
<i>Phryma leptostachya</i> L.	rare	infrequent	widespread
<i>Plantago aristata</i> Michx.	local	rare	western
<i>Plantago purshii</i> R. & S.	no report	scarce	western
<i>Galium aparine</i> L.	scarce	infrequent	widespread
<i>Galium coccineum</i> T. & G.	no report	infrequent	widespread
<i>Galium obtusum</i> Bigel	no report	infrequent	widespread
<i>Galium pilosum</i> Ait.	frequent	rare	northern
<i>Lobelia cardinalis</i> L.	frequent	infrequent	widespread
<i>Lobelia kalmii</i> L.	no report	infrequent	northern
<i>Specularia perfoliata</i> (L.) A. DC.	rare	infrequent	widespread
<i>Ambrosia trifida</i> L.	no comment	rare	widespread
<i>Antennaria neodioica</i> Greene	no report	rare	northern
<i>Antennaria plantaginifolia</i> (L.) Hook.	common	infrequent	widespread
<i>Artemisia ludoviciana</i> Nutt.	no report	rare	western
<i>Aster cordifolius</i> L.	no report	scarce	widespread
<i>Bidens comosa</i> (Gray) Wieg.	common	infrequent	widespread
<i>Cacalia atriplicifolia</i> L.	infrequent	infrequent	widespread
<i>Coreopsis lanceolata</i> L.	no report	rare	widespread
<i>Eclipta alba</i> (L.) Hassk.	rare	rare	southern
<i>Erechtites hieracifolia</i> (L.) Raf.	common	infrequent	northern
<i>Erigeron annuus</i> (L.) Pers.	infrequent	infrequent	widespread
<i>Erigeron philadelphicus</i> L.	no comment	infrequent	widespread
<i>Eupatorium altissimum</i> L.	no report	infrequent	widespread
<i>Eupatorium purpureum</i> L.	common	scarce	widespread
<i>Helianthus strumosus</i> L.	no report	infrequent	widespread
<i>Helianthus tuberosus</i> L.	rare	rare	widespread

TABLE 4. *Continued.*

Name	Moseley (1928)	Easterly (1978)	Distribution
<i>Hieracium canadense</i> Michx.			
var. <i>fasciculatum</i> (Pursh) Fern.	infrequent	rare	northern
<i>Lactuca biennis</i> (Moench) Fern.	no report	infrequent	northern
<i>Lactuca floridana</i> (L.) Gaertn.	rare	rare	widespread
<i>Ratibida pinnata</i> (Vent.) Barnh.	no comment	infrequent	western
<i>Rudbeckia laciniata</i> L.	no report	infrequent	widespread
<i>Silphium perfoliatum</i> L.	no report	rare	widespread
<i>Silphium terebinthinaceum</i> Jacq.	scarce	infrequent	western
<i>Solidago hispida</i> Muhl.	rare	infrequent	widespread
<i>Solidago riddellii</i> Frank	rare	infrequent	western
<i>Solidago speciosa</i> Nutt.			
var. <i>angustata</i> T. & G.	common	infrequent	widespread

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