A Preliminary List of Plants of the Sand Mounds of Muscatine and Louisa Counties, Iowa

Mabel Estle Brown
Iowa State College

Robert G. Brown
Iowa State College
A PRELIMINARY LIST OF PLANTS OF THE SAND MOUNDS OF MUSCATINE AND LOUISA COUNTIES, IOWA

MABEL ESTLE BROWN AND ROBERT G. BROWN

This paper deals with the flora of a dune area in Muscatine and Louisa counties in Iowa known locally as the Sand Mound, the only region of its kind nearer than the sand hills of Nebraska to the west and the dunes of Lake Michigan to the east. Shimek in 1893 listed the plants of the Iowa Sand Lands including the Sand Mound, but no one has actually determined the flora of the large dune. It is the purpose of this paper to learn as far as possible what plants grow on the mound including its margins.

THE SAND MOUND

The Sand Mound is located ten miles south of the city of Muscatine on the west side of the Mississippi river. It rises thirty or forty feet in height above the surrounding river flood plain. It comprises approximately fifteen hundred acres, a little over half being in Muscatine County and the rest in Louisa. It is roughly horseshoe-shaped. The south prong of the shoe ends in the Mississippi river while the north prong is bordered by a marsh which circles the mound a mile and a half westward and is continuous southward to McKee Lake.

In regard to the geologic origin of the Sand Mound, J. A. Udden in the “Geology of Muscatine County” says, “On the south half of sections 33 and 34 there is a remnant of a terrace known as the Sand Mound, rising from thirty to forty feet above the level of the island. It consists of rather fine white sand with very few pebbles. Some of the surface material on the island may have been derived from this terrace. . . .” Professor F. M. Witter, in his “History of Muscatine County,” writes: “The Sand Mound, the northern part of which is in the southeastern corner of the county, is no doubt a part of the debris of the sandstones crushed by the glaciers, washed away by the river, or both. . . .” 

1 The authors wish especially to thank Dr. I. E. Melhus, Head of the Botany Department at Iowa State College, for suggesting the problem, for assistance in making the collections and in preparing the manuscript. Aid and assistance were received also from Dr. J. C. Gilman, Dr. Ada Hayden, and Dr. G. J. Goodman, all of Iowa State College, and Mr. Jess Fults, Associate Agronomist of the Soil Conservation Service. Thanks are also due Mr. Albert McKee for permission to botanize on his private game preserve.

2 Shimek, Bohumil, “The Sand Flora of Iowa” Bulletins from the Laboratories of Natural History, Vol. VII.
ter what the origin of this mound of sand in this river bottom the fact remains that the area exists and is subject to wind action today.

In general, the direction of the "blows," which are on the east portion of the mound, is from northwest to southeast. Some blows are twenty or thirty feet deep and some as long as an eighth mile or more. Where the sand is advancing on the remnant forest, entire trees of an estimated forty-foot height are buried to their top branches. Others have varying portions of their trunks yet exposed.

Between the more or less permanent west side and the moving area is a strip of land one-half to one-and-one-fourth miles wide used for watermelons, cantaloupes, and sweet potatoes.

**Some of the Showy Plants and the Time They Blossom on the Mound**

Although the authors began watching the dune area March 30, the first plant found was on April 19 at the foot of East Hill along the marsh, *Cardamine pennsylvanica*. The first real dune plant came about the same time, brought perhaps by our first warm week in an abnormally cold spring. This plant was *Draba caroliniana* and was followed by bluets, (*Houstonia patens*). In a week a showy yellow succulent plant *Corydalis crystallina* came and stayed a month or more. May and June were the months of rapid plant growth. The east slope was dominated by columbine, (*Aquilegia canadensis*). The sandy prairie violet, (*Viola pedatifida*) grows in the open to the edge of the moving sand.

After the early spring flowers there was a definite trend in the flower color toward yellow (orange) and blue. Following the deep orange-yellow of *Lithospermum augustifolium* and the creamy ivory *Baptisia bracteata* came the blue of *Linaria canadensis*. The latter dominated for two weeks or more every part of the sand mound except the open blow.

*Astragalus distortus* was found on what we thought to be virgin sod in the middle of the mound. Later a few plants were found in virgin sod along an east side gully. This is rare in Muscatine county. A second rare plant in Iowa was found at the foot of the Sand Mound at the east end of the footpath across the marsh. This was mousetail, *Myosurus minimus*.

There followed in rapid succession *Penstemon pallidus*, *Delphinium Penardi*, *Amorpha canescens*, *Achillea Millifolium*, *Saponaria perfoliata*, *Erigeron canadensis*, *Helianthus petiolaris*, and
then the showy lavender-colored *Pentstemon grandiflorus*. Along with these were of course many others but these were most prevalent among the herbaceous plants.

Fig. 2. Trees are buried beneath shifting sands. *Spartina cynosuroides* on the banks on each side of the blow above are being gradually undermined by wind action. In the foreground is *Lespedeza capitata*.

Fig. 3. Looking north from a high point south of McKee Lake. The arrow in the background indicates a car.
Fig. 4. Aquilegia canadensis covers the east slope of the Sand Mound.

The sequence of families and genera follows that of Gray's Manual, ed. 7, as does the nomenclature. The plants marked with an asterisk were not included in Prof. Shimek's list.

DIVISION I. PTERIDOPHYTA

Equisetaceae
*Equisetum arvense L.
*Equisetum hyemale L. var. robustum (A. Br.) A. A. Eaton

DIVISION II. SPERMATOPHYTA

Class I MONOCOTYLEDONEAE

Typhaceae
*Typha latifolia L.
Hydrocharitaceae
*Elodea canadensis Michx.
Gramineae
Andropogon furcatum Muhl.
Andropogon scoparius Michx.
Sorghastrum nutans (L.) Nash.
Digitaria sanguinalis (L.) Scop.
Paspalum ciliatifolium Michx.
*Panicum lanuginosum Ell.
*Panicum praecoccum Hitch. & Chase
Panicum Scribnianum Nash.
Panicum virgatum L.
*Setaria glauca (L.) Beauv.
*Setaria viridis (L.) Beauv.
Cenchrus tribuloides Walt.
Stipa spartea Trin.
*Aristida sp.
*Alopecurus carolinianus Walt.

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Fig. 5. *Penstemon grandiflorus*.

Fig. 6. *Panicum virgatum*.
Brown and Brown: A Preliminary List of Plants of the Sand Mounds of Muscatine and

1939] PLANTS OF DUNE AREA IN IOWA 173

*Hordeum nodosum L.
Elymus canadensis L.
Cyperaceae
Cyperus filiculmis Vahl.
Cyperus Schenckii Torr.
*Scirpus pedicellatus Fernald
Carex cephalophora Muhl.
Carex festucaea Schkuhr.
Carex pensylvanica Lam.
Araceae
Acorus Calamus L.
Commelinaceae
Tradescantia reflexa Raf.

Commelina virginica L.
Juncaceae
Juncus tenuis Willd.
Liliaceae
*Smilax herbacea L.
*Allium canadense L.
*Smilacina stellata (L.) Desf.
Amaryllidaceae
*Hypoxis hirsuta (L.) Coville
Iridaceae
*Iris versicolor L.
Sisyrinchium campestre Bicknell

Class II DICOTYLEDONEAE

Salicaceae
Salix humilis Marsh.
Salix longifolia Muhl.
Betulaceae
*Betula lutea Michx.
Urticaceae
*Cannabis sativa L.
*Celtis occidentalis L.
Santalaceae
Comandra umbellata (L.) Nutt.
Polygonaceae
*Pagopyrum esculentum Moench.
Rumex Acetocella L.
Rumex crispus L.
*Rumex altilissimus Wood.
Polygonum Convolvulus L.
*Polygonum pensylvanicum L.
Polygonum ramosissimum Michx.
*Polygonum sagittatum L.
Polygonum tenue Michx.
Chenopodiaceae
Cycloloma atriplicifolium (Spreng.) Coulr.
Chenopodium album L.
Chenopodium Botrys L.
Chenopodium leptophyllum Nutt.
Salsola kali var. tenuifolia G. F. W. Mey.
Amaranthaceae
*Amaranthus retroflexus L.
Pruellia floridana (Nutt.) Moq.
Phytolaccaceae
*Phytolacca decandra L.
Nyctaginaceae

Oxybaphus nyctagineus (Michx.) Sweet.
Aizoaceae
Mollugo verticillata L.
Caryophyllaceae
*Arenaria lateriflora L.
*Cerastium nutans Raf.
Cerastium viscosum L.
*Cerastium vulgatum var. hisutum Fries.
Silene antirrhina L.
Silene stellata (L.) Ait. f.
Ranunculaceae
Caltha palustris L.
*Ranunculus abortivus L.
Ranunculus fascicularis Muhl.
*Myosurus minimus L.
*Thalictrum dioicum L.
Anemone canadensis L.
Anemone caroliniana Walt.
Anemone cylindrica Gray.
Clematis Pitcheri T. & G.
*Aquilegia canadensis L.
Delphinium Penardi Huth.
Menispermaceae
*Menispermum canadense L.
Fumariaceae
*Corydalis aurea Willd.
*Corydalis crystallina Engelm.
Cruciferae
Draba caroliniana Walt.
Lepidium apetalum Willd.
*Lepidium virginicum L.
*Capsella bursa-pastoris (L.) Medic.

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Fig. 7. The trees in the background border the Mississippi river.

Fig. 8. *Conchris triboides* grows everywhere on the Sand Mound but particularly on the sides of "fresh blows."
<table>
<thead>
<tr>
<th>Family</th>
<th>Species</th>
</tr>
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<tbody>
<tr>
<td>Sisymbrium</td>
<td>canescens var. brachycarpon (Richards) Wats.</td>
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<tr>
<td>Brassicaceae</td>
<td>Deutaria lacinata Muhl.</td>
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<tr>
<td>*Cardamine bulbosa</td>
<td>(Schreb.) BSP</td>
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<td>*Cardamine</td>
<td>pennsylvanica Muhl.</td>
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<tr>
<td>*Arabis hirsuta</td>
<td>(L.) Scop.</td>
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<td>*Arabis dentata T.</td>
<td>&amp; G. Capparidaceae</td>
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<tr>
<td>Polanisia</td>
<td>graveolens Raf.</td>
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<td>*Polanisia trachysperma T. &amp; G. Saxifragaceae</td>
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<tr>
<td>Heuchera</td>
<td>hispida Pursh.</td>
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<tr>
<td>Ribes</td>
<td>gracile Michx.</td>
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<td>Rosaceae</td>
<td>Spiraea salicifolia L.</td>
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<td>*Fragaria</td>
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<td>Potentilla</td>
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<tr>
<td>Rubus</td>
<td>sp.</td>
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<tr>
<td>Rosa</td>
<td>humilis Marsh.</td>
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<td>Rosa</td>
<td>pratincola Greene.</td>
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<td>Prunus</td>
<td>americana Marsh.</td>
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<td>*Prunus virginiana L.</td>
<td>Leguminosae</td>
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<td>*Gymnocladus</td>
<td>dioica (L.) Koch</td>
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<td>Cassia</td>
<td>chamaecrista L.</td>
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<td>*Cassia Medsgeri</td>
<td>Shafer.</td>
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<td>Baptisia</td>
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<td>Crotalaria</td>
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<td>*Trifolium</td>
<td>repens L.</td>
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<td>Trifolium</td>
<td>stoloniferum Muhl.</td>
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<td>Melilotus</td>
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<td>*Melilotus officinalis (L.) Lam. Amorpha canescens Pursh.</td>
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<td>*Amorpha</td>
<td>fruticosa L.</td>
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<td>Petalostemonum</td>
<td>candidum Michx.</td>
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<td>Petalostemonum</td>
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<td>*Tephrosia</td>
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<td>Astragalus</td>
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<td>*Astragalus</td>
<td>canadensis L.</td>
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<tr>
<td>Desmodium</td>
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<td>Desmodium</td>
<td>illinoense Gray</td>
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<td>Lespedeza</td>
<td>capitata Michx.</td>
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<td>Strophostyles</td>
<td>helvola (L.) Britton.</td>
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<td>*Robinia</td>
<td>Pseudo-Acacia L.</td>
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<td>Oxalis</td>
<td>stricta L.</td>
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<tr>
<td>Oxalis</td>
<td>violacea L.</td>
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<td>Geraniaceae</td>
<td>Geranium carolinianum L.</td>
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<td>Zygophyllaceae</td>
<td>Tribulus terrestris L.</td>
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<tr>
<td>Rutaceae</td>
<td>Zanthoxylum americanum Mill.</td>
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<tr>
<td>Ptelea</td>
<td>trifoliata L.</td>
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<tr>
<td>Polygalaceae</td>
<td>Polygala incarnata L.</td>
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<tr>
<td>Polygala</td>
<td>sanguinea L.</td>
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<td>*Polygala Senega L.</td>
<td>Polygala verticillata L.</td>
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<td>Euphorbiaceae</td>
<td>Croton capitus Michx.</td>
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<td>*Croton glandulosus var. septentrionalis (Muell.) Arg. Euphorbia corollata L.</td>
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</tr>
<tr>
<td>*Euphorbia dentata Michx. Euphorbia maculata L. Euphorbia polygonifolia L.</td>
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<td>Anacardiaceae</td>
<td>Rhus canadensis var. trilobata (Nutt.) Gray. Rhus glabra L. Rhus Toxicodendron L.</td>
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<td>Staphyleaceae</td>
<td>*Evonymus atropurpureus Jacq.</td>
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<td>*Staphylea trilolia L.</td>
<td>Aceraceae</td>
</tr>
<tr>
<td>*Acer Negundo (Moench) Koehne. *Acer saccharinum L. Balsaminaceae</td>
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<tr>
<td>Impatiens</td>
<td>biflora Walt.</td>
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<td>Rhamnaceae</td>
<td>Ceanothus americanus L.</td>
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<td>Vitaceae</td>
<td>*Psedera quinquefolia (L.) Greene. Vitis vulpina L. Tilia americana L. Malvaceae</td>
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<tr>
<td>*Callirhoe</td>
<td>triangulata (Leavenw.) Gray.</td>
</tr>
</tbody>
</table>

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Fig. 9. *Physostegia virginiana*.

Fig. 10. *Spartina cynosuroides* found in blow on top of the Sand Mound in Muscatine County, Iowa.
*Abutilon Theophrasti Medic.
*Malus rotundifolia L.
*Hibiscus miltaris Cav.  
Hypericaeae
Hypericum cistifolium Lam.  
Cistaceae
Helianthemum canadense (L.?)  
Michx.
Helianthemum majus BSP.  
Lechea stricta Leggett.  
Lechea tenuifolia Michx.  
Violaceae
Viola fimbriatula Sm.
Viola pedata L.  
*Viola pedatifida G. Don.  
*Viola palmata L.  
*Viola sagittata Ait.
*Viola sororia Willd.  
Cactaceae
Opuntia Rafinesqui Engelm.  
Onagraceae
Oenothera biennis L.  
Oenothera mucicata L.  
Oenothera rhombipetala Nutt.  
Umbelliferae
Eryngium yuccifolium Michx.
*Chaconyllum procumbens (L.)  
Crantz.  
Cornaceae
*Cornus asperifolia Michx.  
*Cornus stolonifera Michx.  
Primulaceae
Androsace occidentalis Pursh.
*Stenonema ciliatum (L.)  
Raf.  
Oleaceae
*Fraxinus americana L.  
Apocynaceae
 Apocynum cannabinum L.  
Asclepiadaceae
*Asclepias amplexicaulis Sm.  
Asclepias syriaca L.
Asclepias tuberosa L.  
Asclepias verticillata L.  
Accrates viridiflora Ell.  
Convolvulaceae
Convolulus sepium L.  
Cuscuta arvensis Beyrich.  
Polemoniaceae
*Phlox maculata L.
Phlox pilosa L.  
Hydrophyllaceae
Ellisia Nectelea L.  
Boraginaceae
Lithospermum angustifolium  
Michx.
Lithospermum canescens Lehm.  
Lithospermum Gmelini Hitchc.  
Onosmodium occidentale Mackenzie.  
*Myosotis virginica (L.) BSP.  
Verbenaceae
Verbena auglifolia Michx.  
Verbena bracteosa Michx.  
Verbena hastata L.  
Verbena stricta Vent.  
*Lippia lanceolata Michx.  
Labiatae
Teucrium canadense L.  
Stacks palustris L.  
*Monarda fistulosa L.  
Monarda mollis L.  
Monarda punctata L.  
Hedeoma hispida Pursh.  
Pycnanthemum flexuosum (Walt.)  
BSP.
*Nepeta cataria L.  
*Physostegia virginiana Bentah.  
*Leonurus Cardiaca L.  
Solanaceae
*Solanum nigrum L.  
Physalis pruinosa L.  
Physalis pubescens L.  
*Physalis virginiana Mill.  
*Datura Stramonium L.  
Scrophulariaceae
Verbascum Blattaria L.  
Verbascum Thapsus L.  
Scrophularia loporella Bicknell.  
*Scrophularia lanceolata Pursh.  
Pentstemon gracilis Nutt.  
Pentstemon grandiflorus Nutt.  
Linaria canadensis (L.) Dumont.  
Synthyris Bullii Heller.  
*Veronica peregrina L.  
*Veronica Tournefortii C. C. Gmel.  
*Helone sp.  
Bignoniaceae
Catalpa speciosa Warder.  
Acanthaceae
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Ruellia carolinensis (Walt.) Steud.

Gnaphalium polycephalum Michx.
Plantaginaceae

Plantago aristata Michx.

*Plantago Purshii R. & S.
Plantago Rugelii DC.

*Plantago virginica L.

Rubiaceae

*Houstonia patens Ell.

*Cephalanthus occidentalis L.
Caprifoliaceae

*Sambucus canadensis L.

Curcurbitaceae

*Sicyos angulatus L.

Campanulaceae

*Campanula americana L.

Specularia perfoliata A. DC.

Lobeliaceae

*Galium aparine L.

Silphium integrifolium Michx.

*Silyos canadensis L.

Rubiaceae

*Helianthus petiolaris Nutt.

Helianthus scaberrimus Ell.

Helianthus occidentalis Riddell.

Helianthus grosseserratus Martens.

Coreopsis palmata Nutt.

*Helenium autumnale L.

*Aster sericeus Vent.

Erigeron canadensis L.

Erigeron divaricatus Michx.

Erigeron ramosus BSP.

Erigeron philadelphicus L.

Antennaria plantaginifolia Richards.

Antennaria neglecta Greene.

Antennaria neodioica Greene.

Silphium integrifolium Michx.

Silphium laciniatum L.

Ambrosia artemisiifolia L.

Ambrosia pilosachya DC.

Xanthium commune Britton.

Rudbeckia hirta L.

Rudbeckia subtomentosa Pursh.

Brauneria pallida Britton.

Brauneria angustifolia (DC.) Heller.

*Lepachys pinnata T. & G.

*Helianthus petiolaris Nutt.

Helianthus scaberrimus Ell.

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