

1930

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Recommended Citation

Pammel, L. H. (1930) "Some Weeds of Iowa, Florida, Lower Rio Grande Valley, Cuba and India Compared," *Proceedings of the Iowa Academy of Science*, 37(1), 143-149.

Available at: <https://scholarworks.uni.edu/pias/vol37/iss1/28>

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SOME WEEDS OF IOWA, FLORIDA, LOWER RIO
GRANDE VALLEY, CUBA AND INDIA
COMPARED

By L. H. PAMMEL

The question of weeds and the migration of plants is an interesting phase of botany. I have discussed this subject quite fully in several papers on weed migration.¹

Many most interesting papers have been published by Dr. Asa Gray² on pertinacity and predominance of weeds.

Other contributors to this field are: E. W. Claypole, M. L. Fernald,³ B. D. Halsted,⁴ Kabsch,⁵ R. M. Harper,⁶ L. H. Dewey,⁷ Joseph Burtt-Davy,⁸ T. D. A. Cockerel,⁹ A. S. Hitchcock and G. S. Clothier,¹⁰ are others.

Several recent excellent papers by R. I. Cratty,¹¹ and a paper by L. A. Kenoyer,¹² are also of great value in showing distribution.

I traced the early introduction of such weeds as *Lactuca Scariola* which made its appearance in Hovey's garden near Cambridge, Massachusetts in 1863 or 1864. It took twenty years for the plant to become common in St. Louis, Missouri. The earliest record of it for Wisconsin is 1883 and Illinois, although the earliest record of it for Iowa was by J. C. Arthur in 1870.¹³ It reached the Pacific coast in the late eighties or early nineties. The extension

¹ The Weed Flora of Iowa, Bull. Ia. Geol. Survey, 4:687-769. Second Edition, L. H. Pammel and C. M. King. Article by L. H. Pammel, p. 576-614. L. H. Pammel and C. M. King, Weed Survey of Story County, Ia., L. H. Pammel, Ecology, 321-339. Weeds of the Farm and Garden, 76-86. Distribution of some Weeds in the United States, Proc. Ia. Acad. Sci. 2:103. The Problems of Weeds in the West. Proc. Ia. Acad. Sci. 17:34. Introduced Plants of the Clear Creek Canon. Proc. Ia. Acad. Sci. 21:119. A Comparative Study of the Weeds of Central Iowa, Northern Minnesota and Wisconsin, Proc. Ia. Acad. Sci. 22:57. Notes on the Weeds of California. Proc. Ia. Acad. Sci. 23:494. Weeds of California and Their Relation to Weeds in Other Sections of the Country, Proc. Ia. Acad. Sci. 34:153.

² Scientific Papers 2:234-242.

³ Report Montreal Horticultural Society and Fruit Growers' Association, Province of Quebec 3:70-91, 1897.

⁴ American and English Weeds compared, Pl. World. 3:171-173.

⁵ Das Pflanzenleben der Erde. 642. Hannover, 1870.

⁶ Some native weeds and their probable origin. Bull. Torr. Bot. Club. 35:347-360. 1908.

⁷ Migration of weeds, Yrbk. U. S. Dept. Agr. 1896:263-285.

⁸ Some Injurious weeds. Trans. Agr. Jour. 3:291-299. Abs. in Exp. Sta. Rec. 16:1091.

⁹ Some western weeds and alien weeds in the west. Bot. Gaz. 20:503-504. 1895.

¹⁰ Reports on Kansas weeds. Bull. Kan. Agr. Exp. Sta. 50:19-54; 52:87-101; 57:64; 66:19-54; 76:23; 80:113-164.

¹¹ Iowa State College Journ. of Science, 3:247-269.

¹² Weed Manual of Gwalior States and adjacent parts of India, Bull. Dept. Agr. and Agr. Engineering, Gwalior Government, 1:226, 1924.

¹³ Biennial Rep. Ia. State Coll. 4. See Proc. Ia. Acad. Science. 2:111.

of the Russian thistle is another illustration of the rapid spread when a plant once becomes established. This weed became established in Scotland, Bonhomm county, South Dakota in 1873-1874. It was found in Woodbury county Iowa by A. S. Hitchcock in 1888, and Mr. R. I. Cratty found it at Emmetsburg in 1890 or 1891. In less than a quarter of a century it was a common weed from the Atlantic to the Pacific.

Perennial weeds do not migrate quite as rapidly. The *Solanum carolinense* has been known in Iowa since the early seventies and probably earlier. It is recorded by Dr. Arthur¹⁴ previously from southeastern Iowa. It has taken this plant sixty years to become firmly established in the northern tiers of counties in Iowa, although reported from Fayette in 1892, by Mrs. M. E. McWilliams.

Bidens involucrata (Nutt) Britton, which for many years has been a common plant in southern Iowa, Keokuk, Burlington and Montrose to Winterset only appeared recently in Story county.

When first found in Des Moines, more than thirty years ago it was not common. I found it near Slater in 1902. It has become abundant at this point but has not shown a tendency to spread north very fast. A near relative of this, *Bidens leucantha* (L.) Willd., which Small¹⁵ states is common in waste places in Florida is a good illustration of the northward migration of a tropical weed. The writer first became familiar with the weed in the Everglades near Miami and Palm Beach, Florida in 1928. Again this plant was observed in the same region in 1930 in greater abundance. It was fairly common for a hundred miles north of Miami. I did not see the plant at Gainesville in 1927 or 1928, but Prof. M. D. Cody sent me a specimen from Gainesville he collected in 1930. The plant is evidently a recent introduction.

In looking through the Iowa State College herbarium I find specimens collected in Palm Beach, Florida, by (Curtiss) in 1895 and from the Everglades in the United States National herbarium. This is one of the most common weeds of Florida. It was evidently introduced from Cuba. Small states "also in the West Indies and Mexico and widely distributed in the tropical countries." Dr. Asa Gray¹⁶ in Synoptical Flora of North America says: "Common in South Florida, West Indies and Mexico."

I did not see any of the plant in the Lower Rio Grande Valley in 1929. Robert Combs¹⁷ from the Cienfuegos district in the

¹⁴ Contribution to the Flora of Iowa 1876, p. 26.

¹⁵ Flora of Southeastern United States, 1280.

¹⁶ Synoptical Flora of North America, the Gamopetalae, Sec. Edition of Vol. I. Part II., and Vol. II, Part I. Collected. Smithsonian Institution, Washington, 1886. p. 297.

¹⁷ Proc. Ia. Acad. Sci. 4:116. Weed Flora of Iowa, 1913, p. 756.

Santa Clara province mentions this as a very common weed. We saw great quantities of this weed everywhere in the provinces of Havana, Pinar Del Rio and Matanzas. There is every indication that this weed is migrating northward.

The European morning glory (*convolvulus arvensis*) is another interesting case of migration. This weed has been common in the East for many years. In recent years it has spread rapidly in three or four counties in northwestern Iowa, Lyons and Osceola counties. It has been well established in Ames since 1886 and evidently is¹⁸ "of long standing in the United States." It is mentioned by Torrey in his Compendium of "The Flora of the Northern and Middle States" in 1826, and Dr. Gray in his first edition of his manual in 1848 gives the distribution from Massachusetts to Pennsylvania. Darlington, in 1853, states: "This foreigner has gradually extended itself among us — and will probably give our farmers much trouble if they do not carefully guard against it." This certainly has been realized in many of the central and eastern states. The statement in the seventh edition of Gray's manual would indicate quite general distribution in the region embraced in this work. The fifth edition (1876) states, "fields near the coast; likely to become a troublesome weed." Britton gives its distribution from Nova Scotia to Kansas (1901); South Dakota, Parker (1903). It was abundant in St. Louis in 1886 and was reported at various times in Iowa as a troublesome weed before 1889. Since 1887 it has been well established in Ames; it was reported from Ladora, 1895 (John Hiltbrummer); Des Moines, 1896 (C. N. Page); Westgate, 1902 (P. H. Hinager); Fort Dodge 1912 (F. W. Paige); and very likely occurs in other places. It was first introduced as a cultivated plant. This has become one of the most pestiferous of our perennial weeds.

The distribution in Iowa according to specimens found in the Herbarium of the Iowa State College is: Ames 1894-1895, (G. W. Carver; 1896, 1929 (L. H. Pammel); 1900, (E. R. Hodson); 1913 (H. E. Pammel and Byron Knaps); Chickasaw county 1826 (W. D. Spiker); Estherville 1922 (B. O. Wolden); Fayette 1893 (Bruce Fink); Froelich 1928 (Marion Helwig); Fremont county 1898 (T. J. and M. F. L. Fitzpatrick); Kelley, 1911 (Pearl Clayton); Lamoni 1911, Fremont county 1898 (J. P. Anderson); Rock Rapids 1926 (Lester Shepard); Westgate 1902 (P. H. Winegar).

Since the earlier publications, the writer has received many

¹⁸ Weed Manual of Gwailor State and Adjacent parts of India, Bull. Gwailor Department of Agriculture, 12:1-126, f 1-172, 1924.

specimens of this weed from many parts of Iowa, which include the following counties: Clinton, Linn, Scott, Polk, Dubuque, Lyon, Sioux, Clay, and also fairly common in Story, Grundy, Tama and many others. It is one of the most troublesome and pestiferous weeds of the great vallies and Coast region of California and in Kansas and Colorado.

Experiments have been conducted to treat the weed. In our experiments sodium chlorate was used at the rate of one pound to a gallon of water. Two sprayings successfully killed the weed but because of the explosive nature of the sodium chlorate caution should be used in its application. Calcium chlorate is said to be equally effective.

Three grasses are distributed over Cuba. Johnson grass, which is common everywhere and causes a great deal of trouble is one of these. Just when this was introduced I do not know.

Another is Bermuda grass, abundant everywhere in pastures I visited. The third is natal grass introduced about 1900. I am told that it came with hay from Florida. This is common especially in Havana province. All of these grasses serve very useful purposes for live stock in Cuba.

The natal grass which was introduced as a forage plant in Cuba about 1900 was introduced with hay and now is common in at least the provinces of Havana and Matanzas.

It is interesting to compare the weeds of different countries with those found in Iowa, Florida and Cuba. Dr. L. A. Kenoyer¹⁹ in a paper on the weeds of Gwailor State, India, shows some of the weeds also common in Iowa. Among these some of the most dominant of our weeds occur, like *Setaria glauca*, *Digitaria sanguinalis*, and some of these are common in Cuba. In checking these up I have made use of the Diccionaria Botanico by Dr. Juan Tomas Roig y Mesand²⁰ of Comb's paper on the Flora of Cienfuegos, and my own collecting.

¹⁹ Weed Manual of Gwailor State and Adjacent parts of India, Bull. Gwailor Department of Agriculture, 12:1-126, f 1-172, 1924.

²⁰ Diccionaria Botanico de Nombres vulgares Cubanos. 3 parts, Part 1-897, 1928.

Table Showing Distribution of Some Weeds in Iowa, Lower Rio Grande, Florida, Cuba, and India

Name of Species	Iowa	Florida	Lower Rio Grande	Cuba	India
<i>Angiospermae - Monocotyledoneae</i>					
GRAMINEAE					
<i>Digitaria sanguinalis</i> (L.) Scop.			x		x
<i>Digitaria filiformis</i> (L.) Koeler		x		x	
<i>Echinochloa crus-galli</i> (L.) Beauv.	x		x		x
<i>Cynoden Dactylon</i> (L.) Pers.		x	x	x	
<i>Eleusine indica</i> Gaertn.	x	x	x	x	x
<i>Setaria verticillata</i> (L.) Beauv.	x			x	
<i>Setaria glauca</i> (L.) Beauv.	x	x			
<i>Setaria viridis</i> (L.) Beauv.	x	x	x		
<i>Setaria setosa</i> Beauv.				x	
<i>Holcus halepensis</i> L.	x	x	x	x	
<i>Tricholaena rosea</i> Nees.		x		x	
CYPERACEAE					
<i>Cyperus rotundus</i> L.		x	x	x	
<i>Cyperus esculentus</i> L.	x	x	x	x	
COMMELINACEAE					
<i>Commelina virginica</i> L.		x		x	
<i>ANGIOSPERMAE-Dicotyledoneae</i>					
URTICACEAE					
<i>Pilea microphylla</i> Lieb.		x		x	
POLYGONACEAE					
<i>Rumex crispus</i> L.	x	x	x	x	
<i>Polygonum Persicaria</i> L.	x	x	x		
<i>Chenopodium ambrosioides</i> L.	x	x	x	x	
<i>Chenopodium album</i> L.	x	x			
AMARANTHACEAE					
<i>Amaranthus spinosus</i> L.	x	x	x	x	
<i>Amaranthus hybridus</i> L.	x	x	x		
<i>Alternanthera muscoides</i> Benth. and Hook.		x		x	
PHYTOLACCACEAE					
<i>Phytolaccaca decandra</i> L.	x	x	x		
<i>Mirabilis jalapa</i> L.			x	x	
PORTULACACEAE					
<i>Portulaca oleracea</i> L.	x	x	x	x	x
<i>Portulaca</i> sp.				x	
PAPAVERACEAE					
<i>Argemone mexicana</i> L.	x	x	x	x	
<i>Argemone platyceras</i> Link. & Otto.				x	
CARYOPHYLLACEAE					
<i>Saponaria Vaccaria</i> L.	x		x		x
<i>Stellaria medea</i> (L.) Cyrell	x	x	x		
CRUCIFERAE					
<i>Brassica arvensis</i> (L.) Ktze.	x	x	x	x	
<i>Lepidium virginicum</i> L.	x	x	x	x	
<i>Capsella Bursa-pastoris</i> (L.) Medic.	x	x	x	x	
<i>Nasturtium officinale</i> R. Br.	x	x	x	x	
LEGUMINOSAE					
<i>Acacia Farnesiana</i> Willd.			x	x	
<i>Cassia occidentalis</i> L.	x	x	x	x	
<i>Cassia obtusifolia</i> L.				x	
<i>Vigna vexillata</i> Rich.				x	
<i>Aeschynomene americana</i> Sw.				x	
<i>Belaira mucronata</i> Griseb.				x	

Name of Species	Iowa	Florida	Lower Rio Grande	Cuba	India
OXALIDACEAE					
<i>Oxalis corniculata</i> L.	x	x	x	x	x
ZYGOPHYLLACEAE					
<i>Tribulus maximus</i> L.			x	x	
<i>Tribulus terrestris</i> (L.) Caltrop.	x				x
EUPHORBIACEAE					
<i>Racinus communis</i> L.		x	x	x	
<i>Euphorbia Preslii</i> Guss.	x	x	x	x	x
<i>Euphorbia heterophylla</i> L.	x	x	x	x	
<i>Euphorbia pilulifera</i> L.				x	
<i>Croton lobatus</i> L.				x	
<i>Croton glandulosus</i> var. <i>geminus</i> Müll.		x		x	
<i>Acalypha virginica</i> L.	x				
<i>Acalypha chamaedrifolia</i> L.		x		x	
Malvaceae					
<i>Sida acuta</i> Burm. var. <i>carpinifolia</i>				x	
<i>Sida urens</i> L.			x	x	
<i>Sida spinosa</i>	x		x		
<i>Malachra ruderalis</i> Gurcke.				x	
CONVOLVULACEAE					
<i>Convolvulus arvensis</i> L.	x	(Mo. Ill. Kan. Calif.)			x
<i>Ipomoea Bona-nox</i> L.				x	
SOLANACEAE					
<i>Physalis pubescens</i> L.	x	x	x	x	
<i>Solanum nigrum</i> L.	x	x	x	x	x
<i>Solanum bahamense</i> L.		x		x	
BORAGINACEAE					
<i>Heliotropium Indicum</i> L.	x	x	x	x	x
<i>Heliotropium curassavicum</i> L.		x	x	x	
VERBENACEAE					
<i>Verbena urticaefolia</i> L.	x	x		x	
<i>Lantana Camara</i> L.		x		x	
<i>Lippia nodiflora</i> Michx.		x	x	x	
<i>Bouchea Ehrenbergii</i> Cham.				x	x
<i>Stachytarpheta</i> var. <i>Jamaicensis</i> Vuhl.				x	
LABIATAE					
<i>Ocimum sanctum</i> L.				x	
<i>Salvia tenella</i> Sw.				x	
<i>Hyptis pectinata</i> Poit.				x	
PLANTAGINACEAE					
<i>Plantago major</i> L.	x	x	x	x	
<i>Plantago lanceolata</i> L.	x	x		x	
SCROPHULARIACEAE					
<i>Scaparia dulcis</i> L.				x	
RUBIACEAE					
<i>Richardia Scabra</i> L.				x	
<i>Diodia teres</i> Walt.		x	x	x	
CAPRIFOLIACEAE					
<i>Sambucus intermedia</i> Carr.		x		x	
CUCURBITACEAE					
<i>Melathria peruvaga</i> Griseb.				x	
COMPOSITAE					
<i>Ambrosia artimesaefolia</i> L.	x	x	x	x	
<i>Ambrosia trifida</i> L.	x	x	x		
<i>Eupatorium serotinum</i> Michx.	x	x			
<i>Erigeron canadensis</i> L.	x	x	x	x	
<i>Parthenium hysterophorus</i> L.		x	x	x	

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Name of Species	Iowa	Florida	Lower Rio Grande	Cuba	India
<i>Eclipta alba</i> Hassk	x	x	x	x	
<i>Xanthium commune</i> Britton	x	x	x	x	
<i>Flaveria repanda</i> Lag.				x	
<i>Chaptalia albicans</i> Vent.				x	
<i>Bidens leucantha</i> (L.) Willd.		x		x	
<i>Bidens bipinnata</i> L.	x	x		x	
<i>Helenium tennifolicum</i> Nutt		x	x		
<i>Erechtites hieracifolia</i> (L.) Raf.	x	x	x	x	
<i>Cirsium horridulum</i> Michx.		x			
<i>Sonchus oleraceus</i> L.	x	x	x	x	
<i>Sonchus arvensis</i> L.	x				
<i>Taraxacum officinale</i> Weber	x	x	x		
<i>Cichorium Intybus</i> L.	x				