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slower than it ought to be if the results of the uses of organs are seized directly by evolution.

February 2, 1892.

[Paper B.]

NOTES ON THE MINNESOTA SPECIES OF
LACINIARIA.

E. P. Sheldon.

The genus *Laciniaria* is used to designate certain perennial North American herbs, belonging to the natural order Compositæ. So far as has been determined this genus has fifteen living species and attains its greatest predominance in the South Atlantic states.

Speaking somewhat more minutely, they are characterized as follows: Perennial herbs with simple, wand-shaped, very leafy stems, from a tuberous or corm-like root-stock; they bear reversely racemose or spicate heads of handsome rose-purple flowers in late summer or autumn; the leaves are all alternate, entire, rigid and mostly glabrous.

The species usually inhabit dry, open, uncultivated grounds, although certain of them seem to prefer moist, low grounds or wet edges of pine barrens. Most noticeable in this regard are *L. spicata* (L.) O. K., and the peculiar bog-inhabiting forms of *L. scariosa* (L.) Hill.

In general it may be said that *Laciniaria* is found from Ontario and the Saskatchewan on the north to Florida and northern Mexico on the south, and from the Atlantic ocean on the east to the Rocky mountains on the west.

Laciniaria scariosa (L.) Hill is by far the more common species, as it is found throughout the range; and considering its extreme variability and its close relationship to a large number of the other species, it may be taken as a centre around which the rest may be grouped.

In genetic relationship *Laciniaria* is near to *Brickellia* and *Kuhnia*, on the one hand, and *Garberia* and *Carphephorus*, on the other.

It is to be noted that these all belong to the section

Adenostylinæ of the tribe Eupatoriaceæ. A tribe which has but one genus on the European continent, and that they are all typical North American prairie composites which attain their greatest abundance in the southern portion of their range.

Points like these tend more than anything else to throw light on the origin of the American composites and help to explain their present distribution over the North American continent.

We often turn aside from the more far-reaching points of relationship and distribution when studying a group of plants and question their utility.

In the present case a most pleasing answer can be given. First of all their beauty attracts our attention, and to such a degree that many species are artificially grown both in America and in the botanic gardens of the continent. Then again the corm or rootstock, particularly that of *Laciniaria scariosa* (L.) Hill, is largely used in medicine and as a substitute for vanilla.

SYNOPSIS OF MINNESOTA SPECIES.

§1. Pappus very plumose; heads 16-20 flowered, cylindrical with turbinate base; bracts of the involucre much imbricated with herbaceous tips if any; lobes of the corolla pilose inside; leaves all linear and rigid, the lower elongated and grammiform.

1. *L. squarrosa* (L.) Hill.—Pubescent or partly glabrous; stem stout, 6 to 20 inches high; heads few or sometimes numerous in a leafy spike or raceme; bracts of the involucre all herbaceous, lanceolate, rigid and with somewhat pungent tips, squarrose-spreading and prolonged. Dry gravelly or sandy soil, Ontario to Minnesota, Nebraska, Texas and Florida.

In the southern portion of the state, rare.

2. *L. cylindracea* (Michx.) O. K.—Most glabrous, a foot high; heads few or several, 16-20-flowered, an inch or less long; bracts of the involucre all appressed, barely herbaceous, rounded and abruptly mucronate at the tip, the outermost very short. Dry prairies and woodlands, Ontario and Michigan to Minnesota and Missouri.

Frequent in the central portion of the state, but rare north and south.

Specimens from Brainerd (Macmln & Sheld.), Goodhue county (Sandberg), Minneapolis (Herrick), Glenwood (Taylor).

L. cylindracea (Michx.) O. K.—Var. *solitaria* Macmln.* Differs from the type of the species in having a bushy stem 6 to 12 inches high, heads somewhat larger, never spiked, but solitary, terminal, erect or nodding.

This variety has much more the aspect of a pink than a Blazing Star.

Specimens from Brainerd (Macmln & Sheld.), Glenwood (Taylor).

§2. Pappus minutely plumose; heads 3 to 6-flowered; bracts of the involucre acuminate or mucronate, coriaceous-herbaceous, not appendaged; corolla-lobes naked; leaves all narrowly linear and the upper generally acerose.

3. *L. punctata* (Hook.) O. K.—Stems erect, 6 to 30 inches high, from a thick and branching or sometimes globular rootstock; leaves and bracts punctate, rigid; head 4 to 6-flowered, oblong or cylindraceous, from one-half to three-fourths inch long. Mostly numerous and crowded in a dense, often leafy, spike; bracts oblong, abruptly cuspidate—acuminate, often languinous ciliate. Dry prairies and plains. Saskatchewan and Minnesota, west to Montana and Colorado, south to Texas and New Mexico. Common in the prairie region of the state, more rare eastward.

Specimens from Red Wing, Cannon Falls (Sandberg), Blue Earth county (Leiberg), Cedar Lake (Holtz), Montevideo (Moyer), Lake Benton, Minneapolis (Sheldon), Emmet county, Iowa (Cratty), Lindbourg, Kansas (Bodin).

FORMS.

A. *albiflora* n. f.—Six inches to a foot high, spike short, heads 4 to 6, 2 to 6-flowered, bracts abruptly acuminate.

High crests of the Coteau des Prairies, Lincoln county.

B. *corymbosa* n. f.—Heads 1 to 3, borne on the ends of leafy ascending branches, 3 to 5 inches in length, tips of the involucre gradually acuminate, spreading.

* Bot. Gaz. Jan. 1891.

High crests of the Coteau des Prairies, Lincoln county.

§3. Pappus from barbellulate to minutely short plumose under a lense, not to the naked eye.

* Heads subglobose or hemispherical, 15 to 40-flowered; involucral bracts many-ranked, somewhat spreading; corolla lobes short.

L. scariosa (L.) Hill.—Pubescent or glabrate; stem stout, 1 to 5 feet high; lower leaves spatulate or oblong-lanceolate and tapering to a petiole, uppermost small, linear; heads racemose or spicate, the few to numerous involucral bracts broadest and rounded at the summit, either herbaceous or scarious edged and tipped with purple, greatly variable. Dry and sandy ground, Ontario and New England to the Saskatchewan, west to the Rocky mountains and south to Florida and Mexico.

Common, in the southern and central portions of the state.

Specimens from Glenwood, Alexandria (Taylor), Blue Earth county (Leiberg), Minneapolis (Herrick), Brainerd (Macmillan & Sheld.), Idlewild, Lincoln county (Wickersheim), Montevideo (Moyer), Minneapolis (Oestlund), (Kassube), Goodhue county (Sandberg), Minneapolis, Lake Benton, Sleepy Eye, Springfield. (Sheld.)

L. scariosa (L.) Hill. Var. *corymbulosa* Sheld.*—Tall and stout, smooth throughout, except the minutely roughened inflorescence; bearing the single heads at the end of leafy ascending branches which are 2 to 6 inches long; heads longer than in the type; scales of the involucre broadly obovate, dark purple, slightly scarious or not at all.

This plant was first found by Mr. John B. Leiberg in a bog near Mankato.†

Recent search has found it to be the prevailing form in bogs and low grounds throughout the southern and western portions of the state.

Specimens have been examined from Blue Earth county (Leiberg), Verdi, Lake Benton, Sleepy Eye, Waseca, Princeton, Fergus Falls, Minneapolis (Sheldon), Nicollet county

* Bull. Geol. Nat. Hist. Surv. Minn., 9, 77, 1894.

† Upham, Cat. Flora, Minnesota, p. 69, 1883.

(Ballard), Meeker and Kandiyoh counties (Frost), Pope county (Taylor).

FORMS.

(A). *solitaria*, n. f.—Stems slender, 10 to 18 inches high; lower leaves linear-spatulate, gradually becoming smaller as they approach the small subglobose solitary head. Dry ground, rare. Cedar Lake (Holtz).

(B). *globosa*, n. f.—Strict and stout, 6 to 18 inches high from a branching rootstock, heads globose, sessile, bracts spatulate with scarious *white margined* tips. Flowers from *rose purple to cream-colored*.

Crest of the Coteau des Prairies at Verdi, Lincoln county, Minn.

** Heads oblong, 5-flowered; involucre squarrose by the spreading of the colored tips.

L. pycnostachya (Michx.) O. K. Hirsute or glabrous below; stem stout, 3 to 5 feet high, leaves crowded throughout, the lower lanceolate and the upper very narrowly linear; spike dense, cylindrical (5 to 10 inches long), heads (4 to 6 lines long), all sessile; bracts of the involucre 14 to 16, oblong or the inner narrower; the more or less scarious tip purple, usually acute. Prairies, Indiana to Minnesota, south to Arkansas and Texas.

Frequent through the southern portion of the state.

Specimens from Minnesota Lake, Glenwood (Taylor), Springfield, Waseca (Sheldon), Montevideo (Moyer), Minneapolis (Oestlund).

*** Heads from short-oblong to cylindraceous; bracts of the involucre all appressed, obtuse.

L. spicata (L.) O. K.—Glabrous, or somewhat hairy; stem tall and stout, 2 to 5 feet high, very leafy; heads 8 to 13-flowered, one-half inch long, almost erect. Closely sessile and numerous in a dense spike 4 to 12 inches in length. Moist grounds from Massachusetts to Minnesota, and south to Florida and Louisiana.

South half of the state, rare.

Specimens from Blue Earth county (Leiberg), Red Wing, Cannon Falls (Sandberg), Minneapolis (Kassube), Lake Benton, Verdi, Lincoln county, Sleepy Eye.

March 8, 1892.