

*Juncus utahensis* resembles species of the *Ensifolii* group.

Distinction is made as follows:

Stamens 3.....	<i>J. ensifolius</i> Wiks.
Stamens 6.....	
Seeds white-tailed.....	<i>J. utahensis</i> Martin
Seeds only apiculate.....	<i>J. xiphioides</i> Meyer
	<i>J. brunneocens</i> Rydb.
	<i>J. saximontanus</i> A. Nels.

*Juncus utahensis* may be distinguished from *J. nevadensis* S. Wats. by the acute capsule and subterete leaf-blades of the latter species.

Mr. B. Y. Morrison, of the Bureau of Plant Industry, has kindly executed the accompanying illustration.

BUREAU OF PLANT INDUSTRY, WASHINGTON

## TWO UNDESCRIBED PLANTS FROM ARKANSAS

JULIAN A. STEYERMARK

ECHINACEA PURPUREA (L.) Moench, var. **arkansana** var. nov., foliis caulinis 3.5–6 cm. longis, 1–1.5 cm. latis, caulibus tenuibus; capitulis 1–1.2 cm. altis, 1.2–1.5 cm. latis; paleis apicibus longis spinosis terminatis, 10–11 mm. longis; ligulis 2.5–3 cm. longis; acheniis 3.5 mm. longis.—Boggy Springs, Sevier Co., ARKANSAS, July 19, 1937, *Brinkley 259* (TYPE in herbarium of Field Museum).

This variety is smaller in all respects than typical *Echinacea purpurea*. The contrasting set of differences may best be noted in the following table:

ECHINACEA PURPUREA	ECHINACEA PURPUREA VAR. ARKANSANA
cauline 7–19 cm. long	3.5–6 cm. long
leaves 1.5–7 cm. broad	1–1.5 cm. broad
heads 1.5–2.7 cm. high	1–1.2 cm. high
1.1–4 cm. broad	1.2–1.5 cm. broad
rays 4–5.5 cm. long	2.5–3 cm. long
paleas 11–13 mm. long	10–11 mm. long
achenes 4–4.5 mm. long	3.5 mm. long
stems stout	slender

CLEMATIS VERSICOLOR Small, f. **pubescens** f. nov., foliis infra dense puberulis.—Boggy Springs, Sevier Co., ARKANSAS, July 24, 1937, *Brinkley 268* (TYPE in herbarium of Field Museum).

Typical *Clematis versicolor* of southern Missouri and northern Arkansas has perfectly glabrous leaves. In the plant from Sevier Co.



the under surface of the leaves is covered with numerous fine short hairs.

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THE RELATION OF *PINUS RIGIDA* TO PHYSIOGRAPHIC FEATURES AND SOIL TYPES IN CENTRAL MASSACHUSETTS—In the summer of 1935 and 1936 while working on forest succession and soil types in Worcester County, Massachusetts, the writer noticed that *Pinus rigida* Mill., was often found and predominantly so, on certain sandy soils.

In the summer of 1937, I carefully checked the occurrence of pitch pine throughout the 1522 square miles of Worcester County and found that it occurred predominantly (almost exclusively) on soils of the Merrimac and Hinckley series. Occasionally, however, *Pinus rigida* is found on soils of other series, but when this occurs, the trees are found singly in open pastures, to the leeward of dense stands upon the above named soils. The seeds having been carried there by the prevailing wind and there being little competition the pines flourished.

The Merrimac and Hinckley soils are water-lain soils characterized by their relatively high content of sands and gravels. The former soils are found only on terraces, whereas the latter are found on kame terraces, kames,<sup>1</sup> eskers<sup>2</sup> and outwash<sup>3</sup>—all stratified deposits of the glacial period. These sterile sandy physically dry soils are ideal for drought-resisting pitch pine.

The following table contains a mechanical analysis of a Merrimac soil. It is apparent that the soil is excellently drained because of the high percentage of fine gravel, coarse, medium and fine sand, while the percentage of very fine sand, silt and clay—the water-retaining textures—is very low.

MECHANICAL ANALYSIS OF MERRIMAC LOAMY COARSE SAND.

Horizon	f.g.	c.s.	m.s.	f.s.	v.f.s.	silt	clay
0-4 inches. . . . .	13.2	37.0	13.0	18.4	4.5	8.4	6.2
4-6 " . . . . .	18.6	36.5	11.6	16.4	5.1	7.6	4.8
6-20 " . . . . .	20.3	38.9	12.0	15.0	3.8	7.0	3.4
20-36 " . . . . .	30.1	35.4	11.5	16.0	2.6	3.5	1.3

<sup>1</sup> Kames—stratified sandy or gravelly hummocks.

<sup>2</sup> Eskers—irregular ridges of stratified drift.

<sup>3</sup> Outwash—alluvial fan-like plains formed in front of retreating ice during the glacial period.



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