2004-A

# Status Survey of *Eriocaulon koernickianum* (dwarf pipewort) in Oklahoma

Submitted by

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## Species information

### A. Nomenclature, classification, and general taxonomic information

1. Scientific name

*Eriocaulon koernickianum* Van Heurck & Muell.-Arg.

2. Valid synonyms

No valid synonyms exist. Some publications may use the spelling "kornickianum".

3. Classification

Kingdom Plantae
Subkingdom Tracheobionta
Superdivision Spermatophyta
Division Magnolilophyta
Class Liliopsida
Subclass Commelinidae
Order Eriocaulales
Family Eriocaulaceae
Genus *Eriocaulon* L.
Species *Eriocaulon koernickianum* van Heurck & Muell.-Arg.

4. Full bibliographic citation for all binomials

First valid description: In H. F. Van Huerck. 1870. *Observ. Bot. 1: 101.*

4. Type specimen

Charles Wright, Texas.

6. Common name

Gulf pipewort, small-headed pipewort, dwarf pipewort.

7. USDA code

ERKO

8. History of knowledge of the taxon

*Eriocaulon koernickianum* was first collected by Charles Wright in Texas some time between 1837-1852.

9. Current alternative taxonomic treatment

None.

**B. Present legal or other conservation status**

1. Federal

*Eriocaulon koernickianum* currently has no federal status. Prior to 1996, it was a Category 2 for federal listing.

> Category 2="A likely candidate for federal listing as endangered or threatened, but it is necessary to obtain further information regarding possible threats" (Department of the Interior, 1993).

2. State

The status of *Eriocaulon koernickianum* in states reported to include populations of the plant is as follows: Oklahoma: none; Arkansas: SE; Georgia: none; Texas: none.

> SE="The Arkansas Natural Heritage Commission applies this term to native plant taxa which are in danger of becoming extirpated from the state."(Arkansas Natural Heritage Commission, 2001).

**C. Global and state rankings**

1. Global

*Eriocaulon koernickanum* is currently ranked as a G2 species.

> G2="Imperiled globally because of its rarity (6 to 20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to extinction throughout its range" (Oklahoma Natural Heritage Inventory, 2001).

2. State

Oklahoma: S1; Arkansas: S2; Georgia: S1; Texas: S1.

> S1="Critically imperiled...because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because of some factor of its biology making it especially vulnerable to extinction" (Oklahoma Natural Heritage Inventory, 2001).

S2="Imperiled...because of extreme rarity (six to 20 occurrences or few remaining individuals or acres) or because of other factors making it very vulnerable to extinction throughout its range" (Oklahoma Natural Heritage Inventory, 2001).

### D. Related species, technical description, and life history

The pipewort family (Eriocaulaceae Desvaux) includes over 1,200 herbaceous species in 13 genera and is nearly cosmopolitan in its distribution. The family consists of annual or perennial herbs primarily found growing in full sun and wet acidic soils or aquatic habitats. Three genera (*Eriocaulon*, *Lachocaulon*, and *Syngonathus*) are found in the United States. *Eriocaulon* L. includes 400 herbaceous annual or perennial species and is distributed pantropically.

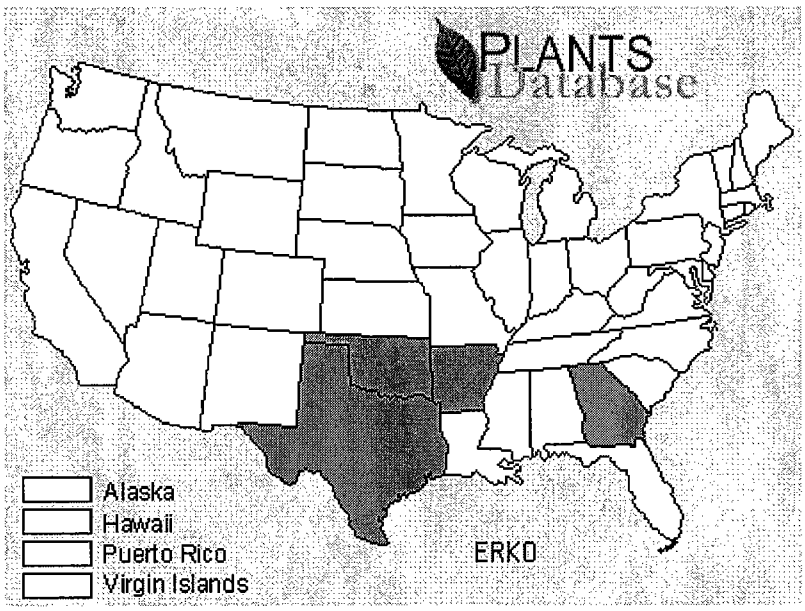
*Eriocaulon koernickianum* is an herbaceous annual or short-lived perennial 5.0-9.0 cm in height. The plant occurs in small tufts from basal rosettes. Stands are typically dense and low growing. Leaves are pale green, thin, linear-attenuate, 1.0-5.0 cm long, and taper evenly from a thin, pale base. Leaf margins are slightly incrassate. The sheath of the scape is 2.0-3.0 cm in length, loose, somewhat inflated, and scarious above. The scape itself is filiform, 5.0-8.0 cm long, twisted, and ridged. Flowers are monoecious and produced in dense, solitary heads. At maturity, the heads are subglobose or short-oblong, 3.0-4.0 mm broad, and dark gray or gray-green with white perianth parts and bracts. Staminate flowers have sepals which are linear-curvate, concave, around 1.0 mm long, and grayish translucent. Petals are subequal and yellowish, with two glanduiferous, tooth-like lobes. Pistillate flowers have sepals which are linear-curvate, around 1.0 mm long, and gray-translucent with pale clawed bases Petals are around 1.0 mm long and spathulate-curvate with broadly rhombic blades, and opaque clawed bases clawed. Petal color is yellowish. Seeds are broadly ovoid and around 0.5 mm long. The surfaces are papillate or rugose and deep reddish brown in color (taken from Kral, 1966 and Watson, 1989).

*Eriocaulon koernickianum* flowers from spring though early fall. Pollination is primarily wind-driven. The pistillate flowers are placed above the staminate flowers in the head, thus limiting self-pollination. Seed set is low, with rates of 40-60% observed in the Oklahoma populations (Watson et al., 1994). Unlike other *Eriocaulon* species, *E. koernickianum* has been found to not reproduce vegetatively. Therefore, recruitment is through seed production only Plants exhibit a high degree of genetic homgenetiy (Watson et al., 1994).

### E. Geographical distribution

*Eriocaulon koernickianum* is found in the Ozark and Ouachita Mountains of Arkansas and Oklahoma. Other populations grow on the Coastal Plain of Oklahoma and Texas. The plant is also found in the eastern United States in the Piedmont region of Georgia. *E. koernickianum* is one of many species with such

a disjunct distribution. Plants are larger vegetatively in the western poulations, however, genetic variation between the two is low (Watson, 1995). Populations are scattered, with 25 known extant and 10 historical (NatureServe, 2002). Within Oklahoma, populations have been reported from Atoka, Muskogee, and Pushmataha counties. Individuals in a population can number from hundreds to thousands.




Distribution of *Eriocaulon koernickianum* (USDA, 2002).

### F. General habitat description

In its western populations, *Eriocaulon koernickainum* is typically found growing on acidic and sandy hillside seeps. Oklahoma populations are positively correlated with the presence of mosses, leaf litter, and bare ground (Watson et al., 1994) and negatively correlated with canopy density (NatureServe, 2002). The plant is found on moist depressions on granite outcrops in the Georgia populations.

## Assessment

### A. Confirmed sites (relocated in 1999)

**1.** Site name: Site has no name, ONHI code is PBR3409527004

Surveyors: Heather Oakley and Newell McCarty, June 14, 1999.

600 flowering genets were observed. Both mature and immature seeds were found. This site is dominated by *Sphagnum* and *Panicum* species and occurs in

a sandy hillside seep. The site appeared to have been disturbed by cattle grazing. Plants were last observed in this area in 1995.

### B. New sites (located in 1999)

No new sites were located in 1999.

### C. Historical sites (not relocated in 1999)

**1.** Site name: Boehler Seeps and Sandhills Preserve

Surveyors: Heather Oakley and Newell McCarty, June 14, 1999.

No plants were observed. Plants were last observed in 1995.

**2.** Site name: Site has no name, ONHI code is PBR3409527003

Surveyors: Heather Oakley and Newell McCarty, June 14, 1999.

No plants were observed. Plants were last observed in 1995.

**3.** Site name: Site has no name, ONHI code is PBR3409527004

Surveyors: Heather Oakley and Newell McCarty, June 14, 1999.

No plants were observed by Oakley and McCarty, however Nature Conservancy employees noted the presence of three plants on June 9, 1999. Plants were previously observed in 1993.

### D. Historical sites (not visited in 1999)

Six other records for *Eriocaulon koernickianum* exist in the ONHI element instance log. It is not known if these were visited in 1999. According to Newell McCarty, all sites were visited in the *early* 1990's. Plants were present in two of these six sites.

### E. Overall assessment of *Eriocaulon koernickianum* in Oklahoma

According to Watson et al. (1994), the number of *Eriocaulon koernickianum* populations in the west has decreased over 50% in the past 20 years. Declining populations can be related to the overall low competitive ability of the plant, resulting from such factors as its annual or weak perennial life history, its lack of vegetative reproduction, its low seed set, its lack of self-pollination, and its genetic homozygosity. *E. koernickianum's* habitat is restricted, but according to

Watson et al. (1994), "potential habitat for the species appears to be plentiful near existing populations". Edaphic conditions were pipewort is present or absent do not differ significantly.

*Eriocaulon koerniciakinum's* decline may in fact be related to fire suppression and the lack of other forms of disturbance. The plant has been reported to flourish in disturbed situations and is probably an early successional species (Watson et al., 1994; NatureServe, 2002). The only recent observation of the plant in Oklahoma was in an area that had been grazed and trampled by cattle.

**Information Sources**

**A. Literature**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Watson, Linda E. 1995. Morphological and genetic divergence among disjunct populations of *Eriocaulon kornickianum*, dwarf pipewort. Unpublished report submitted to U.S. Fish and Wildlife Service, Albuquerque, New Mexico.

**B. Herbarium collections**

All information is from the *Atlas of the Flora of Oklahoma* (Hoagland, 2002).

OCLA=Herbarium of the University of Science and Arts of Oklahoma, Chickasha, Oklahoma.

OKL=Bebb Herbarium, Oklahoma Biological Survey/Department of Botany and Microbiology, The University of Oklahoma, Norman, Oklahoma.

OCLA10538, G. E. Castleberry, 30, July 18, 1983. Pushmataha County, Harrison bog, 5 miles west on highway 3 and 0.5 miles south of Antlers, sandy soil, sphagnum bog, oak woods.

OCLA4183, L. K. Magrath, 11581, June 13, 1981, Pushmataha County, Harrison bog, 5 miles west on highway 3 and 0.5 miles south of Antlers, sandy soil, growing in sphagnum bog.

OCLA5535, L. K. Magrath, 11913, August 18, 1981, Pushmataha County, Harrison bog, 5.1 miles west on highway 3 and 0.5 miles south of Antlers, sandy soil, growing in sphagnum bog.

OKL201925, N. McCarty, s.n., June 12, 1992. Pushmataha County, southwest of Antlers on OK2. T4S R16E Sec. 31.

OKL201924, N. McCarty, s.n., June 12, 1992. Atoka County, 1.2 miles south of Atoka-Pushmataha county line on OK3. Small meadow along west side of road. R4S R14E Sec. 1.

OKL201923, N. McCarty, s.n., June 21, 1992. Pushmataha County, 5.2 mi south of Atoka-Pushmataha county line on OK3. Along sandy seep below tree line along Lamey Slash Creek. T4S R15E Sec. 29.

OKL201922, N. McCarty, s.n., June 27, 1992. Pushmataha County, Boehler Seeps and Sandhills Preserve, about 1.3 miles north of Atoka-Choctaw county line and 0.25 miles west of Boehler.

OKL182533, B. B. Amos, P. Risser, and S. Barber, 765, June 24, 1978. Pushmataha County, approximately 2.4 miles north from junction of 2 and 271 on 2, moist depression in native prairie, many plants within a small area.

OKL201926, N. McCarty, s.n., June 21, 1992. Pushmataha County, 5 miles south of Atoka-Pushmataha county line on OK3, at low water bridge.

OKL58381, M. N. Fisher, 780602-2, June 2, 1978. Pushmataha County, 3 miles south of junction of highways 7 and 271 and 7 miles east of highway 271 on branch of Lamey Slack Creek, T4S R15E Sec. 21 and 28, seepy wet soil along creek.

OKL182531, B. B. Amos, R. Sherwood, and S. Barber, 752, June 6, 1978. Pushmataha County, 3 miles south on highway 271 from Antlers, then 7 mmiles west on section road, along creek in marshy area, approximately 100 yards upstream from roadside.

### C. Knowledgeable persons

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