

## *Erythranthe geyeri* (Torr.) G.L. Nesom (roundleaf monkeyflower) rediscovered in Missouri

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ABSTRACT. — A record of the native plant, *Erythranthe geyeri*, is reported from a spring in Christian County, Missouri. This species was previously known only from historical records in Missouri, and was considered to have been possibly extirpated from the state. This finding represents an important new occurrence record of this species of conservation concern.

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### INTRODUCTION

*Erythranthe geyeri* (Torr.) G.L. Nesom (Phrymaceae) is widely distributed in the United States from Michigan westward, southward throughout much of Mexico (Grant 1924, Barker et al. 2012, Nesom 2012, USDA 2019), and northward throughout much of Canada. We have opted here to use the species name proposed by Nesom (2012). Previously the species was treated with *Erythranthe glabrata* (Kunth) G.L. Nesom for which several subspecies were recognized (Vickery 1990, Yatskievych 2013), including *E. glabrata* var. *jamesii* from Missouri. The conservation status of this and related species is of concern in some states. *Erythranthe geyeri* (as *Mimulus grabratus*) is listed as state endangered in Illinois and threatened in Iowa. A closely related species, *Erythranthe michiganensis* (Pennel) G.L. Nesom (Michigan monkeyflower) from Michigan, is listed as state and federally endangered in that state. In Missouri, *E. geyeri* (as *E. glabrata* var. *jamesii*) is a species of conservation concern, where it is listed as possibly extirpated (Missouri Department of Conservation 2019).

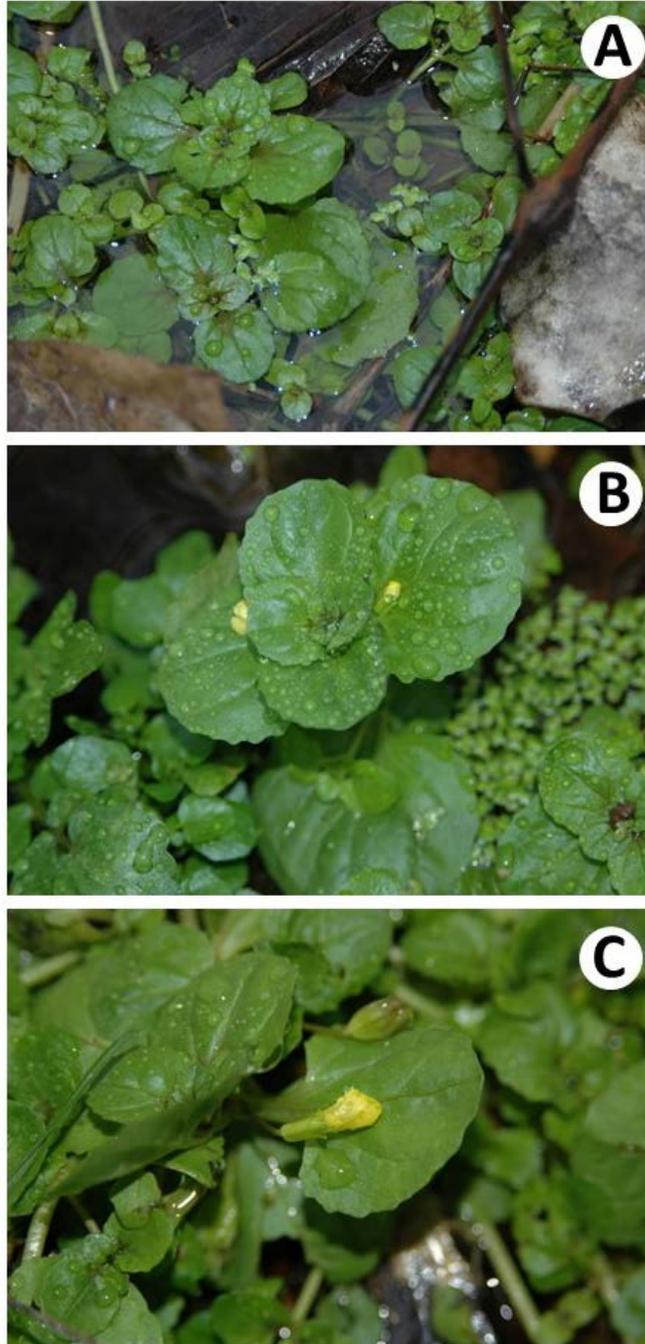
*Erythranthe geyeri* is known only from historical collections from a few counties in Missouri. This species was previously reported from Bates, Barry, Cass, Greene, Holt, Lawrence, and Ste. Genevieve counties (Palmer & Steyermark 1935, Yatskievych 2013, USDA 2019). Here we report a previously unknown population of *E. geyeri* (Figs. 1-3) from Christian County, Missouri. This population was discovered October 22, 2018 at Brown Spring in Christian County during a study by the primary author of ten springs distributed among Greene, Christian, and Stone counties in Missouri. Steyermark (1941) did not report *E. geyeri* from any of the springs he surveyed, but Yatskievych (2013) indicated the habitat of *E. geyeri* was springlets, spring branches, wet ledges, and that it can become an emergent aquatic species. The springs surveyed during this study were all of similar size with approximately third to fourth magnitude flow rates (Vineyard et al. 1974). Nine of the springs flow through a limestone substrate primarily within the

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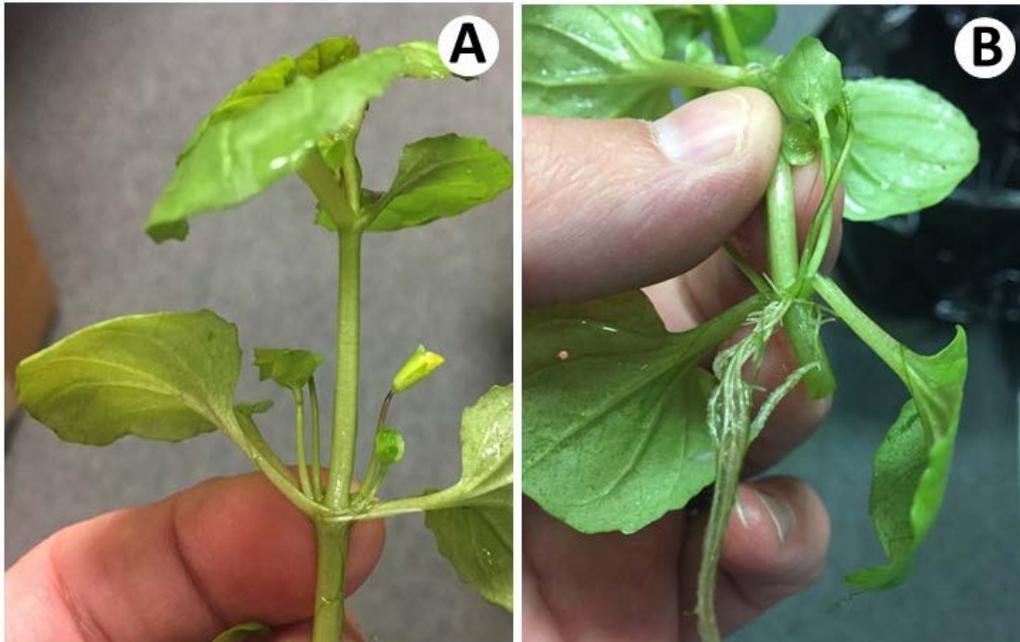
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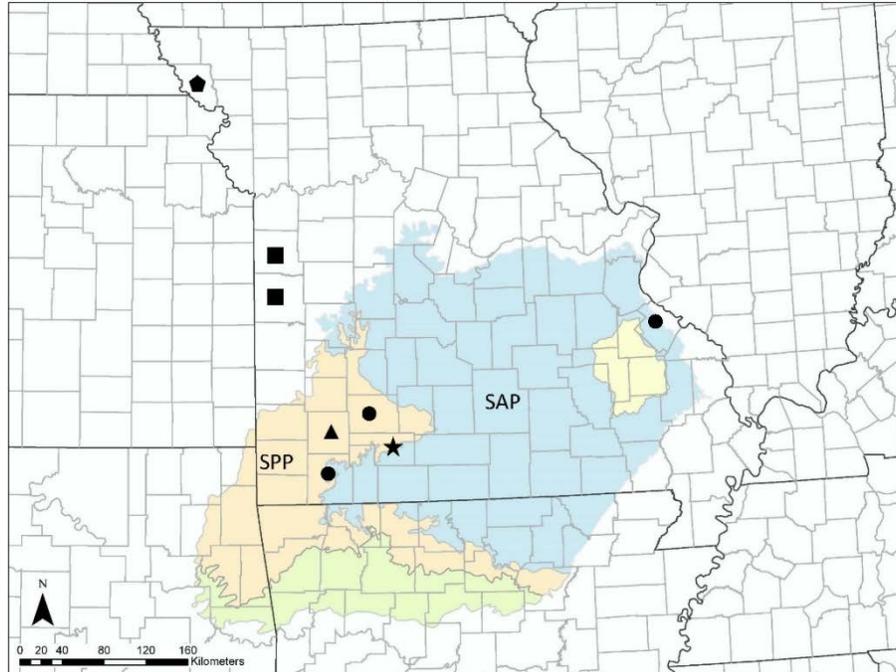
Springfield plateau, but *E. geyeri* was discovered in the one spring that flows through dolomitic substrate along the southwestern portion of the Salem plateau.



**Figure 1:** Roundleaf monkeyflower (*Erythranthe geyeri*) collected from a spring in Christian County, Missouri. **A:** Habititus of the plant in the spring habitat, **B:** Arrangement of the flowers on the plant, **C:** Close-up of a flower.



**Figure 2.** Roundleaf monkeyflower (*Erythranthe geyeri*). **A:** Flower arrangement at a node, **B:** Adventitious roots issuing from a node. All photographs by David Bowles.



**Figure 3:** Map showing the known distribution of *Erythranthe geyeri* in Missouri. Distributional records are: circles (Palmer & Steyermark 1935), squares (Weber et al. 2000), triangle (Yatskievych 2013), pentagon (USDA 2019), and star (this study). SAP=Salem Plateau, SPP=Springfield Plateau.

The population of *E. geyeri* reported here was found growing partially submersed around the spring's margins. No individual plants were found growing fully submersed or beyond the margins of the spring. We found these specimens in flower during late September to early October, and we did not notice flowers prior to that time. The spring is slow-flowing (~0.053 m<sup>3</sup>/sec average) and excavated into a small impoundment located several meters (~51m) downstream of the source. The area surrounding the spring is a manicured lawn where a few roads, houses and other structures are located. Examples of *E. geyeri* were found only in the spring-run downstream of the impoundment. Several other angiosperms, moss and filamentous algae were also observed at the spring (Table 1). Modification of stream channels that increase flow stability and reduce disturbance often benefit aquatic plant colonization and abundance (Bunn & Arthington 2002). The modified spring channel where *E. geyeri* was found may be at least partially responsible for its presence there. The soils around the margins of the spring remain thoroughly saturated year-round and the surrounding manicured lawn may reduce intrusion by other wetland species. We suspect these conditions may reduce competition with other wetland plants and promote the growth of this species. High inputs of dissolved magnesium, an element crucial to photosynthesis, in this dolomitic spring may further provide favorable conditions that support growth of *E. geyeri* (Tränkner et al. 2018).

**Table 1:** Aquatic vegetation associated with the spring where *Erythranthe geyeri* was discovered.

TAXON	COMMON NAME	NICHE HABITAT
<b>Algae</b>		
<i>Cladophora sp.</i>	Green algae	Submersed
<i>Hydrodictyon sp.</i>	Water net	Submersed
<i>Spirogyra sp.</i>	Water silk	Submersed
<b>Mosses</b>		
Fontinalaceae	Moss	Submersed
<b>Flowering Plants</b>		
<i>Lemna minor</i> L.	Common duckweed	Floating, marginal
<i>Poa annua</i> L.	Annual bluegrass	Submersed, emergent
<i>Potamogeton foliosus</i> Raf.	Leafy pondweed	Submersed
<i>Impatiens capensis</i> Meerb.	Spotted Jewelweed	Emergent, marginal
<i>Nasturtium officinale</i> W.T. Aiton	Watercress	Emergent, floating
<i>Euonymus fortunei</i> (Turcz.) Hand.-Maz.	Winter creeper	Marginal
<i>Mentha aquatica</i> L. ( <i>Mentha x piperita</i> )	Watermint (Peppermint)	Emergent, marginal
<i>Erythranthe geyeri</i> (Torr.) G.L. Nesom	Roundleaf monkeyflower	Emergent, marginal
<i>Persicaria longiseta</i> (Bruijn) Kitag	Oriental lady's thumb	Emergent, marginal
<i>Rumex obtusifolius</i> L.	Bitter dock	Emergent, marginal

Wetland areas in southwest Missouri are often small, fragmented, and can be subjected to encroaching human development and other anthropogenic disturbances. We have extensively surveyed multiple spring habitats in southern Missouri and found that Brown Spring contains the only observed population of *E. geyeri*. More information on specific habitat requirements of this species may help clarify the potential distribution of this apparently rare plant in Missouri.

Furthermore, we suggest that *E. geyeri* be retained as a species of concern for conservation status in Missouri until sufficient data shows a wider and more secure distribution of suitable habitat and populations.

*Specimen cited: U.S.A. MISSOURI: CHRISTIAN CO.: Brown Spring, 26 September 2018, Cheri & Bowles s.n. (SMS).*

#### ACKNOWLEDGMENTS

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