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Cicuta bulbifera (Apiaceae) new to Missouri and several notable range extensions at a private wetland in Clark County

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ABSTRACT. — *Cicuta bulbifera* (bulbet-bearing water hemlock), was located along the margins of a privately-owned glacial fen/marsh complex in Clark County, Missouri. This represents the first record for Missouri. This wetland complex hosts large populations of many state-rare, fen-dependent species, including significant range extensions for *Solidago patula* and *Lysimachia quadriflora.*

INTRODUCTION

Cicuta is a genus of four species known from North America and Asia. Historically, the sole species known from Missouri was the widespread and familiar *Cicuta maculata* L., common water hemlock. *Cicuta maculata* occurs in every state in the U.S., and extends from Canada to Mexico (McNeill 2024).

Cicuta maculata is ubiquitous in moist habitats in Missouri, ranging from banks of streams and rivers to moist spots of upland prairies (Yatskievych 2006). *Cicuta bulbifera* L., bulblet-bearing water hemlock, is known primarily from the northern United States, most commonly from northern Minnesota to Pennsylvania and Maine (McNeill 2024). *Cicuta bulbifera* has been documented in a few counties in southern Illinois (SERNAC 2025) and could potentially occur in southeast Missouri or other counties bordering the Mississippi River.

All members of *Cicuta* are considered highly toxic, due to the presence of cicutoxins and oenanthotoxin (Schep et al. 2009); this toxicity is mostly contained in the roots. Both species appear to be excellent host plants for the black swallowtail (*Papilio polyxenes*), as measured by relative growth rate (Finke & Scriber 1988).

DISCUSSION

On 20 July 2023, we discovered thousands of individuals of *Cicuta bulbifera* in a privately owned glacial fen/marsh complex in Clark County, in extreme northeastern Missouri. The Missouri site for *C. bulbifera* has long been of interest to botanists due to the presence of many species rare to the state, although the exact location is withheld due to its location on private property. The site consists of several groundwater seeps flowing out of a sand lens from the adjacent hillside. Most of the observed seeps were under an understory and dominated by watercress (*Nasturtium*

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officinale) until they reached the edge of the marsh, where tree canopy gave way to full sun (**Figure 1**). At this point, the sandy bottom seeps transitioned to deeper muck soil and the plant community shifted to heliophilic species typical of fens, such as *Carex comosa* (S2)*, Epilobium leptophyllum* (S1)*, Dryopteris cristata* (S1)*, Scutellaria galericulata* (S1)*, Liparis loeselii* (S2)*, Lysimachia thyrsiflora* (S1), *Filipendula rubra* (S2), and *Campanula aparinoides* (S1) (all ranks MDC 2025). The preceding species should all be considered associates of *Cicuta bulbifera*.

Figure 1. Shaded spring run out of sandy hillside. *Cicuta bulbifera* occurred on the margins of this spring branch. (*Photo by Reese Worthington*)

Most of these species occurred on the fringes of the complex, presumably where groundwater influence is dominant. Further from the input points, the community shifted to a more typical marsh community. The open marsh was dominated by species such *Typha latifolia* and *Bulb Schoenus fluviatilis,* while *Eupatorium maculatum* var. *bruneri* was abundant and widely distributed across the marsh. These groundwater-fed, fen-like seeps located around the margins of a marsh are most similar to communities seen at Oumessourit Wetland at Van Meter State Park, and many of the above listed species occur at both locations.

The *Lysimachia, Campanula,* and *Eupatorium* were in bloom during our visit. We also noticed that the *Cicuta* throughout the area had narrow leaves with occasional toothing and seemed unfamiliar. Subsequent work on the blooming specimen (*Buback s.n. with R. Worthington*) supported an identification of *C. bulbifera,* and a visit by Worthington on 21 September 2023 resulted in a specimen with bulblets that confirmed the identification (*Worthington s.n.*). Specimens will be accessioned in the Missouri Natural Heritage Herbarium (MNHP) with duplicates sent to MO. Thousands of stems of *C. bulbifera* have been noted occurring in shallow water along the western edge of the area, growing in the fen communities where the seeps enter into the marsh and extending into the marsh habitat, but seemingly limited to areas with groundwater influence. The area occupied by *Cicuta bulbifera* is ca. 4 hectares.

Notable additions to the site flora list include *Carex lacustris* (S2); *Solidago patula*, which appears to be the northernmost collection of this species in Missouri; and *Lysimachia quadriflora,* presumed to be the first collection in Missouri north of the Missouri River (Yatskievych 2013).

Cicuta bulbifera is readily identifiable when the presence of bulblets can be confirmed in the leaf axils (**Figure 2**). The fruits are seldom fertile in this species, and the primary means of spread may be by bulblet (McNeill 2024). Other distinguishing characteristics include narrow, lanceolate leaflets, upper leaflets that are once-compound and the presence of toothing along the margins of the leaflets (McNeill 2024).

Figure 2. *Cicuta bulbifera* at the Clark County, Missouri site. **A.** July photograph showing inflorescence and upper leaves. **B.** September photograph showing bulblets. (*Photos by Steve Buback*)

Given the species range in counties adjacent to the Mississippi River in Illinois and Iowa, it is probable that this occurrence is native. If previous visits did not occur when bulblets are present, then it would be easy to overlook this species throughout the complex. The bulblets are likely spread easily and this population could also be recently introduced. Swink and Wilhelm provide a Coefficient of Conservatism (C value) of 8 for *C. bulbifera,* and list the habitat as "locally frequent in minerotrophic wetlands" (Swink & Wilhelm 1994). A similar C value is recommended for this species in Missouri, as this occurrence is associated with high-quality natural communities and no additional sites have been found despite a large population and searches in nearby habitat.

The discovery of more conspicuous species such as *Solidago patula* and *Lysimachia quadriflora* are more difficult to explain. These species may represent more recent introduction, and future survey work should be conducted to monitor other species that may be extending ranges. The glacial fen/marsh habitat on this private property represents a high-quality natural community in a landscape dominated by human disturbance, and further inventory work of flora and fauna is warranted.

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