

# Final report for: Status survey of a rare lily, *Chamaelirium luteum* (Liliaceae) in Illinois.

Mark E. Mort  
memort@ku.edu

## Introduction

Devil's bit, *Chamaelirium luteum* (Liliaceae), is a dioecious flowering plant species that inhabits moist wooded hillsides throughout its range (Meagher, 1991; Meagher and Antonivics, 1984; Zomlefer, 1997). The range of this species extends from Massachusetts to Florida and westward to southern Illinois and Louisiana. In Illinois this species is quite rare, with only three historic populations in Massac, Hardin, and Pope Counties. The rarity of this species in Illinois could be a function of several factors. First, because Illinois represents an extreme in the range of this species, it is possible that this species is rare due to a lack of suitable habitat in the state.

However, even in other regions, this species is often rare and other factors have been suggested to explain its rare status. For example in New York state, a 14 year monitoring project revealed a steady decline in the number and vigor of mature plants at four different monitoring locations (Utter et al., 1996). In these sites, not only did the number of reproductively mature individuals decline over time, but also there were few to no seedlings found in these sites. Utter et al (1996) suggested that the successional stage of the habitat may be an important factor in the demography and status of this species. For example, *C. luteum* populations in more mature forests are generally smaller, probably due to a reduction in the number of canopy gaps in these habitats. Thus, the rarity of this species in Illinois could also be related to the status of the habitats in which the species has been historically found.



The primary goal of the proposed research was to conduct field surveys to determine the size, number, and successional status of populations of *C. luteum* in Illinois.

## Materials & Methods

Field surveys: The location of the historical populations of *C. luteum* was determined from literature and from herbarium records. In the Spring of 2001, the P.I. attempted to relocate these populations. Field surveys were conducted to locate the populations of this species in Hardin and Pope Counties. These surveys were conducted on foot, by hiking into the areas where the species had

previously been located. Each survey was conducted for a minimum of two days each.

## Results

A total of seven days were spent attempting relocate the historical populations of *C. luteum* in Illinois. Despite the fact that the PI revisited populations that had previously existed, these populations were not relocated. Because these populations were not located, it is not possible at this time to comment upon the probability of the species still existing in Illinois. However, below I suggest some possible future efforts for others interested in this species

## Future Directions

Eventhough the populations of *C. luteum* were not relocated in this study, it is possible that this species is still present in Pope, Massac, and Hardin Counties. The surveys conducted in 2001, were limited in scope. Future efforts should focus on more extensive field work in these counties. In addition, given that the distribution of this species may be dramatically affected by the successional status of the habitats in which it exists, it would be beneficial to not only revisit the historical populations, but also to survey adjacent localities that are at an earlier successional stage. For example, it is possible that although not present in the same localities, that *C. luteum* is present in those habitats that have experienced relatively recent disturbance.



If populations are relocated in Illinois, it would be beneficial to obtain GPS coordinates for each of these populations to facilitate relocating these in the future. Furthermore, if the size of the population permits, it would be important to sample a small amount of leaf material for subsequent DNA analyses. Such studies would permit an estimate of genetic diversity within and between these populations and would provide important insights for the formulation of a recovery plan for this rare species in Illinois.

## Literature Cited

- Meagher, T. R. 1991. Analysis of paternity within natural populations of *Chamaelirium luteum* II. Patterns of male reproductive success. *American Naturalist* 137: 738-752.
- Meagher, T. R. & J. Antonovics. 1984. The population biology of *Chamaelirium luteum*, a dioecious member of the lily family: life history studies. *Ecology* 63: 1690-1700.

Utter, J. M., A. J. Pisani, G. C. Cantore, S. J. Rognalsen, & A. M. Wagner. 1996. Decline of four populations of a rare lily (*Chamaelirium luteum*). *New York Natural History Conference IV, Proceedings and Abstracts*.

Zomlefer, W. B. 1997. The genera of Melanthiaceae in the southeastern United States. *Havard Papers in Botany*.

### **Summary of Expenditures**

The support provided by the IDNR Wildlife Preservation Fund was used to offset the cost of travel while conducting the surveys described above.

A spokesperson from Shamir Medical Center stressed that the study of the Pfizer coronavirus vaccine's connection to a rare disease should not deter vaccinations. An illustrative photo of the Pfizer COVID-19 vaccine. (photo credit: MARC ISRAEL SELLEM/THE JERUSALEM POST). Advertisement. The Pfizer coronavirus vaccine has been linked to an increased chance of developing thrombotic thrombocytopenic purpura (TTP), a rare blood disorder, Israeli researchers said Monday. TTP is an autoimmune disease that causes blood clots to form in various organs of the body. According to the National Institutes of Health, these clots can limit or block the flow of oxygen-rich blood to key organs like the brain, kidneys and heart, resulting in serious health problems. Genetic analysis of male reproductive contributions in *Chamaelirium luteum* (L.) gray (Liliaceae). Authors: P E Smouse T R Meagher. Genealogical analysis is a powerful tool for analysis of reproductive performance in both natural and captive populations, but assignment of paternity has always been a stumbling block for this sort of work. Statistical methods for determining paternity have undergone several phases of development, ranging from straightforward genetic exclusion to assignment of paternity based on genetic likelihood criteria. In the present study, we present a genetic likelihood-based iterative procedure for fractional allocation of paternity within a progeny pool and apply this method to a population of *Chamaelirium luteum*, a dioecious member of the Liliaceae. A survey of the vascular plant ora was conducted at the Solon Dixon Forestry Education Center in south-central Alabama. Over 2000 vascular plant specimens were collected from the 2144 ha site comprising 152 families, 498 genera and 1015 species. This represented a density of 47 species/km<sup>2</sup> and accounted for 25% of all known vascular plant species from the state of Alabama, highlighting the unusually rich biodiversity of this site. In *Precious Heritage: The Status of Biodiversity in the United States* (edited by BA Stein, LS Kutner, JS Adams), pp. 159-200. Oxford University Press, New York, New York. MELANTHIACEAE *Chamaelirium luteum* (L.) Gray. *Stenanthium densum* (Desr.) Zomlefer & Judd, d (As *Zigadenus densus* (Desr.) Illinois Natural History Survey Division of Biodiversity and Ecological Entomology. 1816 South Oak Street Champaign, Illinois 61820. Portions of a conservation assessment for this species in New England authored in 2003 by Dorothy J. Allard of Montpelier, Vermont, were used for several sections of this report, and these have been acknowledged in the appropriate places. I would like to thank Dorothy for the use of this material. The lily genus *Chamaelirium* contains a single species, *Chamaelirium luteum* (L.) A.Gray, found only in eastern North America (Utech 2002). The species is most common in temperate to warm-temperate, moist meadows, thickets, rich forested slopes, and mountain coves from 0-1,100 meters in elevation.