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© 44. **Seed germination of the Illinois-threatened *Agalinis auriculata* (Michx.) Blake (Orobanchaceae).** Molano-Flores, B., Koontz, J., and Feist, M. A. *Castanea* 72:116-118. 2007.

Scientific Note

Seed Germination of the Illinois-Threatened *Agalinis auriculata* (Michx.) Blake (Orobanchaceae)—*Agalinis auriculata* (Michx.) Blake (= *Tomanthera auriculata* [Michx.] Raf. {Orobanchaceae}), eared false-foxglove, is an annual hemiparasitic species that occurs sporadically throughout the eastern and central United States (Gleason and Cronquist 1991, NatureServe 2005, United State Department of Agriculture-Natural Resources Conservation Service 2004). Based on historical records, *A. auriculata* was once more common (Pennell 1935), however it is now threatened in Illinois and endangered in Indiana, Kentucky, Maryland, Michigan, Minnesota, Ohio, Pennsylvania, and Tennessee (Illinois Natural Heritage Database 2004, United State Department of Agriculture-Natural Resources Conservation Service 2004). NatureServe (2005) has ranked this species as G3/N3 meaning *A. auriculata* is rare or uncommon globally/nationally. *Agalinis auriculata* is presumed to be extirpated in Michigan, New Jersey, and Texas; possibly extirpated in Alabama, the District of Columbia, and West Virginia; critically imperiled in Arkansas, Indiana, Kentucky, Maryland, Minnesota, Mississippi, Ohio, Oklahoma, Pennsylvania, South Carolina, Virginia, and Wisconsin; and imperiled in Illinois, Iowa, Kansas, Missouri, and Tennessee (NatureServe 2005). The decline of this species has been linked primarily to habitat loss (e.g., development, succession to woody vegetation, Herkert and Ebinger 2002) and fragmentation, and to habitat management practices (i.e., mowing during flowering period; NatureServe 2005). Aspects of the biology of the species (e.g., seedling survivorship and availability of hosts [Molano-Flores et al. 2003]) may also serve as potential contributors to its decline.

Agalinis auriculata has a scabrous stem that can reach 8 dm in height. The leaves are opposite, sessile, lanceolate, or lance-ovate and purplish-green in color. One diagnostic character for the species is the two small outgrowths at the base of each of the upper leaves that resemble ear lobes (= auricles). In Illinois, *A. auriculata* flowers from August through September. Flowers are perfect with a purple corolla that has a pale-pink throat and red-purple spots. The species is self-compatible and pollinated mainly by bees (Mulvaney et al. 2004, Robertson 1928).

The fruit is a capsule with ellipsoid to ovoid seeds that have a netted surface texture. *Agalinis auriculata* can be found in mesic to wet prairies, disturbed prairies, shrubby prairies, old fields, and red cedar-oak barrens (NatureServe 2005). In Illinois, the species is found mostly in prairies and savannas (Herkert and Ebinger 2002). It has been reported in 24 counties, but only 11 out of 102 have extant populations (Herkert and Ebinger 2002, Iverson et al. 1999, Illinois Natural Heritage Database 2004).

Several studies have been conducted on *Agalinis auriculata* ranging from its reproductive biology to its hemiparasitic nature (Baskin et al. 1991, Cunningham and Parr 1990, Kondo 1973, Molano-Flores et al. 2003, Mulvaney 2002, Mulvaney et al. 2004, Mulvaney et al. 2006, Musselman 1972). One aspect of the biology of this species that has received considerable attention is seed germination (Baskin et al. 1991, Cunningham and Parr 1990, Molano-Flores et al. 2003). Although these studies have increased our knowledge of seed germination requirements (Baskin et al. 1991, Cunningham and Parr 1990) and conditions that favor germination and seedling survivorship (Molano-Flores et al. 2003), information on seed germination differences among populations is lacking. The purpose of this study is to determine if there are seed germination differences (i.e., variability in the percentage of seeds that germinate) among populations of *A. auriculata* in Illinois. These data will aid in developing a better preservation strategy for this threatened species in Illinois.

A total of five populations of *A. auriculata* were sampled for this study. Two populations more than 8 km apart were located at the Midewin National Tallgrass Prairie, Will County (Midewin 1, 1773 individuals; Midewin 2, 156 individuals); two populations 1.6 km apart were located at the Richardson Wildlife Foundation, Lee County (both over 500 individuals); and one population was located near the town of Loda, Iroquois County (23 individuals). Due to the rare status of the species, we sampled only one fruit from randomly selected individuals in each population. At all populations except Loda, we had planned to collect 30 fruits; however, at the time of sampling (October 2001) deer had browsed many of the plants at the Richardson Wildlife Foundation thus reducing the number with mature fruits. Thirty fruits were collected from Midewin 1, 30 from Midewin 2, 9 from Richardson 1, 14 from Richardson 2, and 21

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