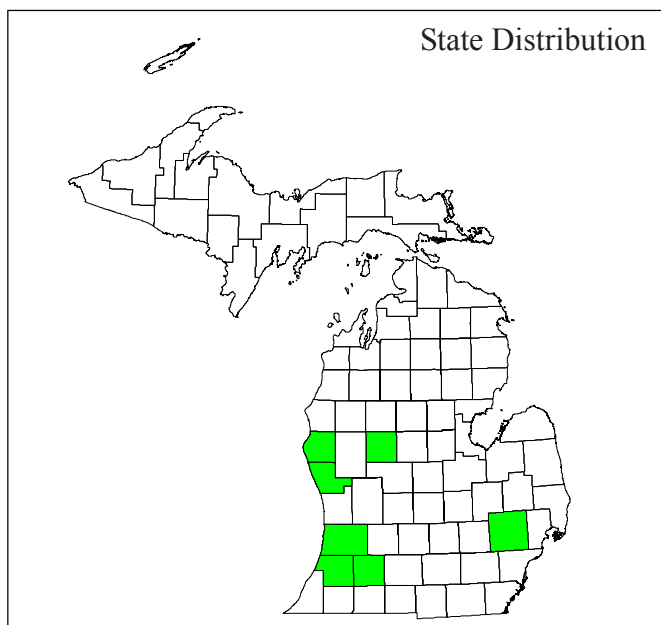
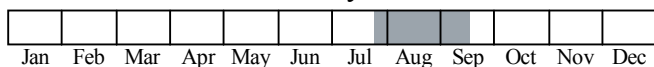




Photos by Dan Tenaglia, [missouriplants.com](http://missouriplants.com)



Best Survey Period



**Status:** State threatened

**Global and state rank:** G5/S2

**Other common names:** forked bluecurls

**Family:** Lamiaceae (mint family), also known as Labiatae.

**Taxonomy:** This North American genus is separated into five sections with a total of 16 species. *T. dichotomum* is one of three species that falls into the Sect. *Streptopodium* (Lewis 1945).

**Range:** *T. dichotomum* ranges throughout eastern North America, stretching from Maine south to Florida, west to Texas and Oklahoma, and north through Missouri and Illinois. It reaches the northwestern limit of its range in Michigan and Ontario. It is considered rare in Indiana and Ontario (NatureServe 2006).

**State distribution:** In Michigan, *T. dichotomum* is found primarily in dry oak savanna regions in the western portion of Lower Michigan. Populations are concentrated in two regions: the border of Van Buren and Kalamazoo Counties and an area in southern Oceana and northern Muskegon Counties. Single occurrences are also known from Mecosta and Allegan

Counties. An Oakland County population has not been observed in over 90 years.

**Recognition:** *T. dichotomum* is an annual herbaceous plant reaching up to 70 cm in height. The terminal stems and numerous lateral branches are covered in minute, dense, glandular hairs, and bear opposite, oval, entire leaves that give off an aromatic lemon-like fragrance when crushed. The pale blue flowers are borne at the ends of lateral and terminal branches, and have 4 small upper petals and one larger lower petal that is spotted with dark blue. The calyx (leaf-like bracts at the base of the flower) has 5 lobes, the 2 lower lobes much shorter than the 3 upper ones. The style and 4 stamens arch over the ovary and lower petal. Fruits are borne as a cluster of four tiny,



The stamens and style arch over the spotted lower petal, facilitating insect pollination.



glabrous nutlets. Only one other species of *Trichostema* is found in our region, *T. brachiatum*, which is distinguished by its calyx lobes being uniform in length and the lower flower petal being only slightly longer than the lateral petals. It is also found predominantly in rocky limestone areas of Drummond Island and Thunder Bay, though it has also been collected in sandy areas in southeast Michigan.

**Best survey time/phenology:** In Michigan, bastard-pennyroyal is best sought late in the summer when flowering in late July into August, but can also be recognizable into September and even October while fruiting.

**Habitat:** *T. dichotomum* is found in dry oak savannas and oak barrens, often in prairie-like openings with acidic, sandy soil. Apparently thriving in recently disturbed areas, it is known from sandy microsites exposed by wind, prescribed fire, and anthropogenic (human-caused) disturbance like the edges of dry railroad grades where they pass through prairie areas. Common associated species include *Quercus alba* (white oak), *Sassafras albidum* (sassafras), *Rhus copallina* (winged sumac), *R. aromatica* (fragrant sumac), *Rubus flagellaris* (northern dewberry), *Andropogon scoparius* (little bluestem), *Danthonia spicata* (poverty grass), *Carex pensylvanica* (Pennsylvania sedge), *Cyperus filiculmis* (slender sand sedge), *Aristida purpurascens* (three-awned grass), *Monarda fistulosa* (wild bergamot), *M. punctata* (horsemint), *Fragaria virginiana* (wild strawberry), *Gnaphalium obtusifolium* (sweet everlasting), *Ambrosia artemisiifolia* (common ragweed), *Polygala polygama* (racemed milkwort), *Krigia virginica* (dwarf dandelion), *Lespedeza capitata* (round-headed bush-clover), *Solidago canadensis* (Canada goldenrod), and *S. nemoralis* (gray goldenrod).

**Biology:** Not emerging until mid-summer, *T. dichotomum* flowers in August. Pollination occurs by bees and other insects, which use the large, spotted, lower petal as a landing platform. As they search for nectar, the overhanging, arching stamens dust pollen on the insects, which transmit the pollen to a similarly arching style on visits to other flowers. Fruits are produced late in summer and into fall, and overwinter prior to germinating the following summer. As an annual, all plants arise from seed in a given year,

making seed production important and seed-banking critical during years with poor flowering or seed-set.

**Conservation/management:** Requiring sandy, open areas, *T. dichotomum* likely benefits from natural disturbance like prescribed fire which burns off accumulated leaf litter, prepares a mineral seed bed, and sets back both woody and herbaceous competition. Due to its late flowering and fruiting time, spring or early summer burns are likely to be more beneficial than fall burns. Removal of encroaching native and exotic woody vegetation will also benefit this species. Herbaceous exotic species also pose a threat, in particular *Centaurea maculosa* (spotted knapweed), a pernicious invader of dry sandy areas that also releases toxic chemicals into the soil that inhibit other plants. Despite many issues related to management needs, habitat destruction remains the largest threat overall, especially since the natural openings occupied by the species also make ideal building sites, grazing areas, and landings during logging operations. Four of the largest populations are protected in natural areas (two on Forest Service land and two on private land) and receive periodic management to maintain habitat.

**Comments:** The name of the genus means “hair-like stamens.” The popular common name “blue curls” also refers to the stamens as well as style, which arch gracefully over the petals, facilitating insect pollination.

**Research needs:** Few studies regarding the species are known, and any research would be beneficial. Of particular value would be investigations into best management practices to maintain the species such as fire return interval, fire seasonality, as well as germination requirements for this sometimes sparse annual.

**Related abstracts:** Oak barrens, dry sand prairie, leadplant, dropseed, tall green milkweed, Leiberg’s panic grass, paniced hawkweed, whiskered sunflower, eastern box turtle, frosted elfin, grizzled skipper, Karner blue, leadplant flower moth, ottoe skipper, prairie warbler, and red-legged spittlebug.



**Selected references:**

- Gleason, H.A. and A. Cronquist. 1991. Manual of Vascular Plants of Northeastern United States and Adjacent Canada. Second edition. The New York Botanical Garden, Bronx, NY. 910 pp.
- Lewis, H. 1945. A Revision of the Genus *Trichostema*. Brittonia. Vol. 5(3):276-303.
- NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: March 7, 2007).
- Swink, F. and G. Wilhelm. 1994. Plants of the Chicago Region, 4<sup>th</sup> ed. Indiana Academy of Science, Indianapolis, IN. 921 pp.
- Voss, E.G. 1986. Michigan Flora. Part III: Dicots (Pyrolaceae – Compositae). Bulletin of the Cranbrook Institute of Science and University of Michigan Herbarium. Ann Arbor, MI. 622 pp.

**Abstract citation:**

- O'Connor, R.P. 2007. Special Plant Abstract for *Trichostema dichotomum* (bastard-pennyroyal). Michigan Natural Features Inventory. Lansing, MI. 3 pp.

Copyright 2007 Michigan State University Board of Trustees.

Michigan State University Extension is an affirmative-action, equal-opportunity organization.

Funding for abstract provided by the Michigan Department of Transportation.

