

## *Saxifraga tridactylites* — a new, weedy saxifrage for Missouri

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ABSTRACT. — *Saxifraga tridactylites*, native to the Old World, is reported new to Missouri, from a ruderal area in Meramec State Park, Franklin County. The species differs from all other members of the Saxifragaceae in Missouri in its annual habit, alternate, narrowly lobed, succulent cauline leaves, and viscid glandular pubescence. A detailed description based on local material is provided, and the North American distribution and likely expansion are discussed.

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### INTRODUCTION

Rueleaf Saxifrage, *Saxifraga tridactylites* L. (Fig. 1) is a small annual native to the Old World, ranging from the Arctic Circle southward in Europe, extending into northern Africa and southwestern Asia (Brouillet & Elvander 2009, Hutchinson 1972, Polunin 1969). In its native range, it occurs in sandy or rocky sites, particularly in calcareous conditions. Scott (1995) lists the habitat in Scotland as “lime-rich grasslands and old walls in low areas”, while Stace (1997) characterizes the species as occupying “bare dry ground on walls, rocks and sand, mostly calcareous”, and being “locally common throughout most of the British Isles”.

In recent years, the species has become established in the New World. Brouillet and Elvander (2009) included the species as an adventive in coastal areas near Victoria, British Columbia, where it was listed as occurring in moist rock crevices and open sandy headlands. More recently, it has been collected in the southeastern United States; Weakley (2015) lists it from “gravel and thin soils along roads and highways” and maps it from Alabama, Mississippi, and Tennessee.

### DISCUSSION

During spring 2019, before the Missouri Native Plant Society meeting at Meramec State Park, I stopped at the park boat launch area along the Meramec River, where I discovered a population of several hundred individuals of *Saxifraga tridactylites* in the parking area bordering the boat ramp, growing in thin silty soil over cracked pavement along a concrete curb. Associates included *Hordeum pusillum*, *Plantago pusilla*, *Plantago virginica*, *Poa annua*, *Sagina decumbens*, *Veronica peregrina*, and *Viola bicolor*.

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**Figure 1.** *Saxifraga tridactylites* in Derbyshire, England, May 2015. Photo courtesy Parkiwiki; <https://creativecommons.org/licenses/by-sa/4.0/legalcode>

*Specimen cited:* **U.S.A. MISSOURI:** FRANKLIN CO.: Meramec State Park, ca. 4.4 miles east of Sullivan, in parking area for boat ramp along west side of Meramec River, 38.2039°N 91.0986°W, 3 May 2019, *Ladd 35149* (MO).

In Yatskievych's (2013) key to Saxifragaceae, the species would key to *Micranthes* Haw., but would obviously not match any of the three members of that genus documented from Missouri, all of which are perennials with entire, exclusively basal leaves. *Micranthes* was formerly included within a broad concept of *Saxifraga*, but recent studies (e.g. Soltis et al. 2001) document that *Saxifraga* is polyphyletic, and *Saxifraga* sensu stricto differs from *Micranthes* in having both basal and cauline leaves, as well as smooth, tuberculate, or papillate seeds as opposed to the ribbed seeds of *Micranthes*. Additionally, *S. tridactylites* is the only annual in either genus in the North American flora, and is unique among Missouri members of the Saxifragaceae in both being an annual and having well-developed, alternate cauline leaves.

Because the species is not included in local floras, and because many existing literature accounts omit key field features, a full description is included here, based primarily on Missouri material. Diminutive annuals to 15 cm tall (winter annuals *fide* Grime 1988); becoming red with age; stems, pedicels, calices, and foliage with abundant, short, erect, gland-tipped hairs ca. 0.10–0.15 mm long; well-developed individuals with several erect stems originating near the base; sparingly and remotely branched above; leaves alternate, thick, fleshy and succulent when fresh (this character not apparent when dried), to 2 cm long, tending to be disposed in the lower half of the plant, the proximal half of the leaf tapering uniformly to a narrow base, the distal half expanded to 1 cm broad and divided into  $3 \pm$  parallel, elongate, narrow lobes, sometimes with 1–3 secondary lobes; leaves in the inflorescence becoming reduced to small, often entire, widely spaced bracts; inflorescence typically more than half of total plant height, somewhat cymose, appearing open, with alternate axillary flowers borne singly on slender erect pedicels to 2 cm long; petals 5, white, entire, 2–3 mm long, broadly clawed; calyx initially divided ca. 40% of its length into 5 erect sepals, these initially smaller than the petals but expanding to 6 mm in fruit; stamens 10, slightly shorter than the petals, with subglobose anthers; ovaries mostly inferior in flower, appearing less so in fruit (described by various authors as semi-inferior to mostly inferior — e.g. Brouillet & Elvander 2009, Stace 1997); styles 2, small, erect, basally united; capsules erect, to  $5 \times 4$  mm; seeds dark brown, 0.3–0.4 mm long, with longitudinal rows of minute blunt tubercles.

According to Hutchinson (1972), the fleshy yellow nectary at the base of the style produces droplets of liquid in sunny weather, suggesting insect pollination, although he notes that the flowers are also effectively self-pollinated. While all Missouri material examined had perfect flowers, Hutchison also noted the occurrence of dioecious flowers in this species. Di Musciano et al. (2018) consider populations of this species in the mountains of central Italy to be self-pollinated.

Reisch (2007) reported that *Saxifraga tridactylites* is “spreading enormously” in calcareous anthropogenic habitats in Europe. Given its rapidly increasing presence along roadsides and interstate highway weigh stations in the southeastern states, as well as the large climate tolerance indicated by its native range, it is likely that this species will expand across the Midwest as well as other parts of North America. Its diminutive stature, annual habit, predilection for sites with minimal established vegetation, and apparent preference for calcareous substrates indicate that it will not be an ecological threat to most natural areas or native habitats, but will likely proliferate along roadsides, parking areas, and similar sites, as well as possibly becoming established on thin soils over bedrock in disturbed limestone and dolomite glades and bluff summits. Future searches of suitable habitats will likely reveal more Missouri populations.

#### LITERATURE CITED

- Brouillet, L. and P.E. Elvander. 2009. *Saxifraga*. In: Flora of North America Editorial Committee, eds. Flora of North America North of Mexico. New York and Oxford: Oxford University Press. Vol. 8, pp. 132-146.

- Di Musciano, M., M.L. Carranza, L. Frate, V. Di Cecco, L. Di Martino, A.R. Frattaroli, and A. Stanisci. 2018. Distribution of plant species and dispersal traits along environmental gradients in central Mediterranean summits. *Diversity* 10(3), 58; <https://doi.org/10.3390/d10030058>
- Grime, J. 1988. *Comparative Plant Ecology*. Berlin, GE: Springer.
- Hutchinson, J. 1972. *British Wild Flowers*, vol. 2. Rutherford, NJ: Fairleigh Dickinson University Press.
- Polunin, O. 1969. *Wildflowers of Europe*. London: Oxford University Press.
- Reisch, C. 2007. Genetic structure of *Saxifraga tridactylites* (Saxifragaceae) from natural and man-made habitats. *Conservation Genetics* 8(4): 893-202.
- Scott, M. 1995. *Scottish Wild Flowers*. London: HarperCollins.
- Soltis, D.E., R.K. Kuzoff, M.E. Mort, M. Zanis, M. Fishbein, L. Hufford, J. Kuntz, and M.K. Arroyo. 2001. Elucidating deep-level phylogenetic relationships in Saxifragaceae using sequences for six chloroplast and nuclear regions. *Annals of the Missouri Botanical Garden* 88: 669-693.
- Stace, C. 1997. *New Flora of the British Isles*, second ed. Cambridge, UK: Cambridge University Press.
- Weakley, A.S. 2015. *Flora of the Southern and Mid-Atlantic States*, working draft 21 May 2015. Chapel Hill: University of North Carolina Herbarium.
- Yatskievych, G. 2013. *Steyermark's Flora of Missouri*. Vol. 3. St. Louis: Missouri Botanical Garden Press.