

Vegetative key to *Galium* of Missouri

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ABSTRACT. – A vegetative key is presented for 16 species of *Galium* (Rubiaceae) and one related species. Fifteen species of *Galium* occur in the Missouri flora and one is frequently cultivated and may become established in the state. Eleven of the state's *Galium* taxa are native, including several species widely distributed in various natural communities.

INTRODUCTION

Representatives of the genus *Galium*, commonly called Bedstraws, occur in a variety of community types throughout Missouri, including wetlands, woodlands, forests, cliffs, glades, prairies, and disturbed areas. Many of these species are widespread across Missouri, being found in almost every county, while others are much more restricted in their distribution. The genus is not exceptionally difficult, but a vegetative key could be useful to field botanists and others learning Missouri's flora, especially those needing to identify specimens that are not yet or are past flowering or fruiting.

Galium is relatively easily identified as a genus as low-growing, weak-stemmed, herbaceous plants with whorled leaves at each node. Of the 16 species known from Missouri, 11 are native; nine of these native species are perennial and two are annual. Three of the four adventive taxa are annual. Additionally, *Galium odoratum* is sold as an ornamental perennial under the common name "Sweet Woodruff". Although not currently naturalized in Missouri, it is included here in the event that it escapes cultivation. A distinct and reliable vegetative difference between specimens of *G. anglicum* and *G. divaricatum* examined here could not be found. The following key uses inflorescence characters from Lipscomb and Nesom (2007) to distinguish the species in this complex.

Sherardia arvensis is found in lawns and similar disturbed areas throughout southern Missouri. Those unfamiliar with the species might be forgiven for assuming it is a species of *Galium* due to its scabrous texture, whorled leaves and Rubiaceae flowers, and so it is included here. *Mollugo verticillata* is sometimes mistaken as a species of *Galium*, but unlike species of Missouri *Galium*, it is completely glabrous and forms a prostrate habit.

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VEGETATIVE KEY TO *GALIUM* IN MISSOURI

1. All or almost all leaves ≤ 10 mm long, short-lanceolate or elliptic.
 2. Leaves with long to medium length hairs; leaf tips usually without minute spine-like projections; various habitats.
 3. Upper stems glabrous to sparsely hairy; leaves with medium length, bristly hairs mostly on margins and veins; number of leaves per node often variable, usually 4-6; native species of glades and occasionally other dry, open habitats.....*G. virgatum*
 3. Upper stems moderately to densely hairy; leaves covered with relatively long, spreading hairs; number of leaves per node usually consistent, either 4 or 6 leaves per node along the whole stem; exotic species of lawns, pastures, and other disturbed areas.
 4. Nodes with 6 leaves.....*Sherardia arvensis*
 4. Nodes with 4 leaves.....*G. pedemontanum*
 2. Leaves with minute hairs (visible with magnification); leaf tips often with small spine-like projections; exotic species of disturbed areas (not reliably distinguished vegetatively).
 5. Terminal flowers and base of inflorescence separated by 2-3 branch points, branches ascending.....*G. anglicum*
 5. Terminal flowers and base of inflorescence separated by 3-6 branch points, branches spreading.....*G. divaricatum*
1. All or almost all leaves >10 mm long, linear, lanceolate, elliptic, ovate, or oblong-spatulate.
 6. Most nodes with 6-8 leaves.
 7. Leaves linear or nearly so, ≤ 2 mm wide.....*G. verum*
 7. Leaves elliptic or oblong-spatulate, ≥ 1.5 mm wide.
 8. Stems with conspicuous spreading, unhooked, usually dense hairs.....
.....*Sherardia arvensis*
 8. Stems glabrous or with hooked hairs.
 9. Plants with many hooked hairs (easily adhering to clothes, etc.); largest leaves oblong-spatulate.....*G. aparine*
 9. Plants glabrous or with a few hooked hairs (not or weakly adhering to clothes, etc.); leaves elliptic.
 10. Mature leaves 5-15 mm wide; plants often aromatic.
 11. Stems glabrous to moderately hairy; nodes usually without a ring of dense pubescence (do not confuse with hairs on leaf bases); widespread native species.....*G. triflorum*
 11. Stems glabrous; nodes usually with a ring of dense pubescence; cultivated perennial not yet found naturalized in Missouri.....*G. odoratum*
 10. Mature leaves 2-7 mm wide; plants not aromatic.
 12. Leaves 4-7 mm wide, tips pointed; known from one historic collection in DeKalb county(northwest Missouri).....*G. asprellum*
 12. Leaves ≤ 3 mm wide, tips rounded (but often with a spiny projection); common and widespread in Missouri
.....*G. concinnum*

6. Most nodes with 4-6 leaves.
13. Leaf tips tapering to definite points (rhombic-elliptic or lanceolate) but without a spine-like projection at the tip; almost always with 4 leaves per node; leaves with 1-3 lateral veins.
14. Leaves ovate to broadly elliptic, with 3 lateral veins.....*G. circaezans*
14. Leaves lanceolate to narrowly elliptic; leaves with 1-3 lateral veins.
15. Largest leaves ≤5 mm wide, often with 3 apparent veins; glacial relict species known from one population on calcareous cliffs in Shannon county (southeast Missouri).....*G. boreale*
15. Largest leaves ≥5 mm wide; often with only 1 apparent vein, sometimes with 2 lateral veins weakly apparent; widespread Ozark woodland species.....*G. arkansanum*
13. Leaf tips mostly rounded (short-ovate or linear), sometimes with a spine-like projection at the tip; 4-6 leaves per node (almost always 4 in *G. pilosum*); leaves with one lateral vein.
16. Leaves broadly elliptic, about 2-3 times longer than wide, mature leaves to 20 mm wide; stems hairy.....*G. pilosum*
16. Leaves more narrowly elliptic, about 3-5 times longer than wide, mature leaves <7 mm wide; stems glabrous or roughened with minute bristles.
17. Bristles on leaf margins and midveins retrorsely barbed; stems roughened, especially below the nodes and on younger branches; most plants with at least some main stem nodes with 5-6 leaves.....*G. tinctorium*
17. Bristles on leaf margins and midveins directed antrorsely or spreading; stems smooth; most plants with 4 leaves per node (sometimes 5).....*G. obtusum*

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LITERATURE CITED

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