

Key to most of the Wisconsin species of *Galium* (Rubiaceae)

1. Ovary and **fruit spreading-bristly**, or **leaves with 3 prominent longitudinal veins**, or (usually) plant with both these conditions (ovary smooth in some plants of *G. boreale*; leaves with only the midrib prominent at base of the blade in some others).
2. Leaves all or mostly in **whorls of 6–8** (–9) with only one longitudinal vein (the midrib) prominent at base of the blade; plant ± reclining or trailing.
3. **Stem and leaf margin rough-scabrous** with **retorse** (or at least divergent) broad-based barbs (may also have slender hairs at or above the nodes); leaves linear-oblongate (usually broadest beyond the middle, tapering more abruptly to apex than to base); annual. This is a circumpolar species of deciduous forests and thickets, especially in disturbed areas, presumably native, but apparently spreading northward. The greater roughness of the upper surface of the leaves, as well as the retrorse (or at least spreading) barbs on the margins, are generally good distinctions from *G. triflorum*, also common in deciduous forests.
***G. aparine* L. [cleavers]**



3. **Stem smooth** or nearly so (occasionally with some spreading hairs) and **leaf margin antrorse-scabrous**; leaves narrowly (rarely broadly) elliptic (tapered ± equally to apex and base); perennial. Deciduous, coniferous, and mixed forests, even swamps (especially cedar if not too wet), fens, river and stream banks; spreading (or persisting) on shores and in clearings. Although the stem is sometimes roughened (or even pubescent), this species is rather easily distinguished from *G. aparine* by the antrorse barbs or minute bristles on the leaf margins (usually best seen by viewing the leaf from beneath) and the more elliptic leaf shape. The mature fruits (excluding the hooked bristles) are up to 2 (occasionally 2.5) mm long and thus smaller than is usual in *G. aparine*.

***G. triflorum* Michx. [fragrant bedstraw]**



2. Leaves all in **whorls of 4** (or fewer), often with a pair of weaker longitudinal veins besides the midrib at base of the blade; plant erect.
4. Branches of the inflorescence with **lateral flowers (and fruits) mostly sessile** or nearly so (pedicels if any less than 1 mm long); corolla yellow-green to deep maroon.

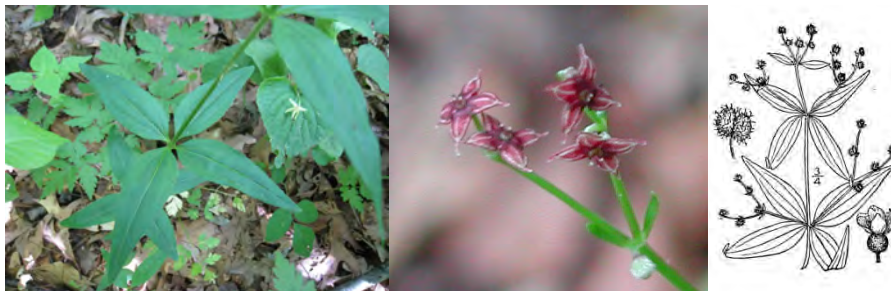
5. **Principal leaves broadly ovate-elliptic, obtuse**, mostly less than 2.5 times as long as broad; internodes and outside of corolla usually pubescent; corolla greenish. Forests, ranging from dry oak-hickory to rich beech-maple (rarely in swampy or coniferous sites). Sometimes difficult to distinguish from *G. lanceolatum*, at least by leaf shape, but generally **more pubescent**, green-flowered, and with leaves more obtuse and shorter.

G. circaezans Michx. [wild licorice]



5. **Principal leaves** (not the lowest) broadly **lanceolate** (widest below the middle), **acute**, (2–) 2.6–4.2 (–5.5) times as long as broad; **internodes and outside of corolla glabrous**; **corolla maroon**. Deciduous forests (beech-maple more often than oak-hickory or northern hemlock-hardwoods). This is one of the few plants blooming in hardwoods in summer.

G. lanceolatum Torr. [yellow wild licorice]



4. Branches of the inflorescence with **all flowers (and fruits) distinctly pediceled**; corolla white to whitish green. Leaves linear-lanceolate, the principal ones mostly 4–14 times as long as broad, with 1–2 pairs of longitudinal veins (besides the midrib) prominent about half or more the length of the leaf; fruit with bristles none or if present not hooked at the tip (at most curved). Upland, ± open forests of oak, hickory, aspen, and/or pine; fields, meadows, prairie remnants; fens, tamarack swamps, thickets; banks of ditches, streams, and lakes. A variable plant, the fruit may be bristly or smooth, the leaves narrowly linear or somewhat lanceolate (but always with 3–5 prominent longitudinal veins at the base), and the stems glabrous or occasionally pubescent.

G. boreale L. [northern bedstraw]



1. **Ovary and fruit smooth** or at most roughened (with tubercles or a few appressed spicules) and **leaves with only one prominent longitudinal vein** (i.e., the midrib).

6. **Leaves sharply cuspidate or awned** at apex, (5–) 6–12 in a whorl.

7. **Stems smooth, glabrous** or puberulent, **erect** or ascending; **leaves 8–12** per whorl at main nodes.

8. Corolla yellow, with acute but scarcely apiculate lobes; internodes puberulent (at least in inflorescence); leaves narrowly linear, strongly revolute, more densely pubescent on the nearly hidden lower surface than on the upper surface. The dense, attractive, bright yellow flowers have a strong aroma. The distinctive needle-like leaves may be as many as 12 at a node. Native to Europe and the Middle East, escaping from cultivation. Fields, meadows, roadsides, railroads, golf courses and untended lawns.

***G. verum* L. [yellow bedstraw]**



8. Corolla white or greenish with at least some lobes often apiculate with prolonged tips; internodes glabrous (rarely puberulent); leaves usually \pm oblanceolate, flat or very slightly revolute, nearly or quite glabrous (except on margins). Largest leaves 2.5–4 cm long, thin and membranous, sparsely scabrous on the margins. An introduction from Europe.

***G. sylvaticum* L. [woodruff, Scotchmist]**



7. **Stems smooth or retrorse-scabrous** (not puberulent), **reclining** on or supported by other plants; **leaves 5–6** in a whorl at main nodes.

9. Margins of leaves smooth or weakly antrorse-scabrous; midrib smooth; leaves linear to very narrowly elliptic-oblong. Deciduous forests, including beech-maple and oak-hickory; banks, floodplain forests along streams. An occasional specimen of *G. boreale* with very small leaves might be mistaken for *G. concinnum*, but the former has leaves all blunt-tipped and only 4 per whorl.

***G. concinnum* Torr. & A. Gray [shining bedstraw]**



9. Margins of leaves and midrib beneath strongly retrorse-scabrous; leaves narrowly elliptic to obovate. Mature fruit less than 2 mm long, smooth or nearly so, on slender, smooth, straight pedicels; plant a much-branched perennial, native. Sprawling over and clinging to other plants in wet thickets, cedar swamps, borders of rivers and streams, marshes and wet meadows; clearings and disturbed moist ground. A rough, clambering plant, rather variable and some individuals smoother than others.

***G. asprellum* Michx. [rough bedstraw]**



6. Leaves merely acute to rounded (not cuspidate or awned) at apex, not over 4–6 in a whorl.

10. Flowers all or mostly (7–) 10–25 per inflorescence (i.e., beyond the distal reduced but leaf-like bract); corolla ca. 2–4 mm broad, 4-lobed; nodes glabrous or nearly so. The leaves are generally 5–6 in well-developed whorls, with margins spreading- or antrorse-scabrous. This is a rather showy species, thanks to the numerous white flowers. An irregularly circumpolar species, ranging west in North America only to Lake Michigan and northern Ontario. Wet gravelly, rocky, or sandy shores and banks; moist ground, meadows, swampy hollows.

***G. palustre* L. [marsh bedstraw] – special concern of NE Wisconsin**



10. Flowers 1–6 (–8) per inflorescence; corolla less than 2 mm broad (3- or 4-lobed) or nodes pubescent.

11. Corolla 2–3 (–4) mm broad (i.e., ca. 1 mm or more long), 4-lobed, the lobes longer than broad; nodes \pm bearded with short hairs; leaf margins scabrous-ciliate with short, conical (broad-based, symmetrical) \pm spreading hairs (or tiny prickles).

12. Leaves less than 2.5 mm broad (to 3.5 mm in shade forms), \pm linear with revolute margins, all or mostly reflexed, the midrib beneath smooth or nearly so; mature fruit ca. 1–1.8 mm long, on pedicels 1–4 mm long. A northern (but not Arctic) species ranging westward in North America to Minnesota, Alberta, and the Northwest Territories. Peatlands and marshy ground along streams and lakes.

***G. labradoricum* (Wiegand) Wiegand [northern marsh bedstraw]**



12. Leaves (at least the broadest) 2.5–6 (–7) mm broad, narrowly elliptic, the midrib beneath usually nearly or quite as bristly-ciliate as the margins; mature fruit ca. 2–2.8 mm long, the longest pedicels 3.5–7 (–12) mm long; deciduous forests (usually beech-maple, not oak-hickory), moist ground (even floodplains) along rivers and streams, shrubby thickets, occasionally in grassy or disturbed ground.
***G. obtusum* Bigelow [blunt-leaved bedstraw, wild madder]**



11. Corolla not over 2 mm broad (i.e., less than 1 mm long), usually 3-lobed (some flowers sometimes 4-lobed), the lobes no longer than wide; nodes glabrous; leaf margins smooth or usually scabrous with short retrorse deltoid barbs. The little retrorse barbules that make the leaf margins scabrous are short-conical, broadly triangular in aspect, like miniature rose prickles, and make *G. trifidum*, *G. tinctorium*, and *G. brevipes*, rather easy to separate from *G. obtusum* and *G. labradoricum*, which have longer, straighter, and more slender bristly hairs along the leaf margins (as well as bearded nodes).

13. Pedicels ± densely (but minutely) retrorse-scabrous, the longer ones (6–) 7–17 (–18) mm long, curved toward the tip at maturity, usually 2 or 3 subtended by a whorl of leaves at ends of branchlets, without a common peduncle. The very slender, even filiform, arcuate, scabrous (seen under a good lens) pedicels, make this species rather easy to recognize except when very young. The leaves are usually more linear than in *G. tinctorium*. Shores of lakes and ponds, river banks, fens, swamps, ditches, hummocks in marshes.

***G. trifidum* L. [northern three-lobed bedstraw, small bedstraw]**



13. Pedicels smooth, not exceeding 8 mm long, and usually straight at maturity, often 2 or 3 on a peduncle (which may be scabrous).

14. Pedicels 0.5–3.5 (–4.5) mm long and often curved at maturity, solitary or in pairs in leaf axils or at ends of branches but not on a common peduncle; corolla not over 1 mm wide; mature fruit 0.8–1.2 mm long; leaves mostly 2.5–7 mm long. Typically forms dense ± prostrate tangled mats. The very small pedicels (usually ± recurved), fruits, corollas, and leaves, if all are displayed, are distinctive. Marshy ground, conifer thickets; calcareous shores and bottoms, interdunal hollows, and ditches.

***G. brevipes* Fernald & Wiegand [limestone swamp bedstraw] – special concern**



14. Pedicels (at least the longest) 3–8 mm long and nearly always straight at maturity, often on a peduncle; corolla ca. 1–1.8 mm wide; mature fruit 1–1.8 (–2) mm long; leaves mostly 5.5–14 (–22) mm long. *Galium tinctorium* is larger in some or all respects than *G. brevipes*, but it is not always easy to separate the two. A few collections with some pedicels arcuate but (unlike *G. trifidum*) smooth, up to twice as long as in *G. brevipes*, are tentatively referred to *G. tinctorium*. The larger corolla and fruit (insofar as present) on these specimens would rule out *G. brevipes*, and the pedicels are less slender than in *G. trifidum*. Marshy ground, wet shores and thickets, cedar and tamarack swamps, peatlands, swamps and pond borders. More to be expected in peaty, mucky places than in sandy ones.

***G. tinctorium* L. [southern three-lobed bedstraw, stiff bedstraw]**

