

## FOUR NEW SPECIES OF GOLDENROD FROM THE EASTERN UNITED STATES.

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The *Solidagos* here described are all kindred plants, but the first seems to connect more with the American *virgaurea* types and the other three rather with the *speciosa* group. The latter would all probably be referred to *S. rigidiuscula*, if to any recognized species.

Consulting on the one hand the original description<sup>1</sup> and on the other the material in the National Herbarium, by *S. rigidiuscula*, we should understand a plant 50 to rarely 90 cm. high with the leaves thick, crowded throughout, none of them much enlarged, the inflorescence (at least normally) narrow and dense, the heads distinctly smaller than those of *S. speciosa*. This would admit several Northern specimens with somewhat thinner leaves and a much less xerophytic aspect, which may eventually be regarded as distinct, but would exclude forms from east of Lake Michigan with the lower leaves more separated and enlarged. It would also exclude *S. venulosa* Greene,<sup>2</sup> a plant ranging from Texas to Kansas, sharply distinguished by its larger heads. The three new species all have the heads rather small, but differ in inflorescence and foliage.<sup>3</sup>

*Solidago castrensis* Steele, sp. nov.

Stem erect, 60 to probably 75 cm. high, rather slender, very smooth, glabrous nearly or quite to the inflorescence, upwards increasingly though moderately hispidulous; foliage sparse, the lower internodes 3 to 5 cm. long, those above gradually somewhat shortened; about five of the lower leaves clearly petiolate, the longest petioles 5 cm. long, somewhat margined but involute and appearing slender, a few of the lowest with vestiges of a hispid ciliation near the insertion; largest leaves 12 to 14 cm. long, their blades narrowly elliptic-obovate, 25 to 35 mm. wide, acute or often apiculate, at length cuneately narrowed into the petiole, serrate for at least the upper half with strongly mucronate teeth; remaining leaves subpetiolate or at last merely attenuate at the base, more finely serrate or sometimes almost entire; all the leaves moderately thick, coriaceous, the slightly upturned margin obscurely roughened, otherwise smooth and glabrous,

<sup>1</sup>Torr. & Gray, Fl. N. Amer. 2: 205. 1842.

<sup>2</sup>Pittonia 5: 138. 1903.

<sup>3</sup>The note may be here appended that the plant intended by me in Contributions, volume 13, page 371, under the name *Solidago missouriensis* was *S. glaberrima* Mart.

with two or three pairs of fairly distinct pinnate veins, the reticulation obvious but not obtrusive; bracts leaf-like and exceeding the clusters for more than half the length of the inflorescence, this loose at the base, more compact above, cylindraceous, the racemes usually only 2 cm. long, but sometimes more developed, slightly if at all compounded, rather acutely ascending; heads narrowly campanulate, 5.5 to 6.5 mm. deep; longer tegules<sup>1</sup> linear to linear-oblong, obtuse, especially in broader states, the tips sometimes wider than the body, sometimes with an incipient isthmus, an oval, herbaceous spot on the back extending as a line far downward; disk flowers 8 to 10; ray flowers 6 to 8; blade of rays oval, 2 mm. long, 1 to 1.2 mm. wide; achenes small, glabrous.

Type in the U. S. National Herbarium, no. 670444, collected at Camp Douglas, Juneau County, Wisconsin, September 9, 1890, by Dr. E. A. Mearns (no. 96).

Besides the type specimen there are from the same collector and the same locality another sheet of the same number, but dated September 13, and two others numbered 98 dated September 9. There are two sheets of *Mearns* 96 which belong apparently to two other species.

The specimens more resemble *S. erecta* than does any other Western material seen, having not only a cylindraceous inflorescence but a similar distribution of the foliage. I think, however, that the species really connects most directly with *S. sciaphila*<sup>2</sup> and *S. gillmani*,<sup>3</sup> a view countenanced by the location; in any case it is not remote from these. It differs from *S. erecta* in its much lower stature, its less spreading branches, the more petiolate tendency of the lower leaves, and its smaller heads and narrower rays and tegules. It differs from *S. sciaphila* in its much narrower and differently shaped leaves, these also somewhat thicker and firmer, and in its somewhat smaller heads with less herbaceous involucre. It is a much less heavy plant than *S. gillmani* and erect in habit, with far smaller heads.

***Solidago chandonnetii* Steele, sp. nov.**

Stem 50 to 75 cm. high, of medium thickness, somewhat decumbent at the base and moderately arcuate, also irregularly somewhat flexuous, glabrous well into the inflorescence, the summit and the distal part of the branches thinly clothed with short, stout, ascending hairs; lower internodes little longer than the upper, the leaves rather numerous but not crowded; foliage habit unequally fusiform, the leaves longest about one-third the distance from base to inflorescence; none of the leaves much lengthened, the largest about 12 cm. long, the lower all petiolate, the upper subpetiolate or at last merely with an attenuate base; blades of the lower leaves oblong, at least a few of them ovately narrowed or even rounder at the apex, those of the middle leaves obovate-lanceolate, acute or nearly so, the remaining leaves reducing to oblanceolate, continuing 3 cm. long up to the inflorescence; all the leaves of medium thickness, firmly coriaceous, roughened on the slightly upturned margin, otherwise smooth and glabrous, pinnately veined but the veins conspicuous only in the lower leaves, rather densely reticulate all over, the lines somewhat more prominent beneath; inflorescence paniculate, ovoid, in weaker specimens more narrowly so, rather dense, the racemes contiguous or a little separated, the upper racemes simple, the lower moderately compounded, the heads numerous; heads narrowly campanulate, only 4 to 5 mm. deep; medial tegules oblong, the inner linear-oblong, both varying somewhat in width, ovately tipped or more rounded; all firm in texture, slightly herbaceous in the middle as indicated by a brown line, somewhat glutinous, minutely double-keeled, the ridges tending to form a loop above, but this mostly obscure; disk flowers about 6 to 8, ray flowers about 5 to 7.

<sup>1</sup> Involucre bracts.

<sup>2</sup> Contr. Nat. Herb. 13: 371. 1911.

<sup>3</sup> Op. cit. 367.

Type in the U. S. National Herbarium, no. 691211, collected at Perham, Otter-tail County, Minnesota, August 6, 1912, by Rev. Z. L. Chandonnet.

The National Herbarium has a second specimen of the same collection and another from the same locality, August 10, 1911, *Chandonnet* 3789; also (later received) from the same collector, unnumbered, two specimens from the Otter-tail River, August 13, 1912; three from Perham, August 22, 1912; and two from Luce, Ottertail County, August 23, 1912. There is besides these also a sheet with two good plants from Zumbrota, Goodhue County, Minnesota, August, 1892, *C. A. Ballard*.

The habitat is indicated as sometimes dry, sandy soil, sometimes prairie.

This species differs from *S. rigidiuscula* in its sparser, biserial foliage and its ovoid panicle. It has in its foliage a distinct look toward *S. fisheri*, but it is a lower and relatively stouter plant with a larger and more dense inflorescence, smaller heads, and heavier involucres.

The National Herbarium is indebted to Father Chandonnet for other important communications.

***Solidago fisheri* Steele, sp. nov.**

Stem 80 to 90 cm. high, reducible to 60 cm., slender, smooth nearly or quite to the inflorescence, there thinly or distally more thickly, hispidulous; lower and upper stem leaves well differentiated; four or five lower internodes 3 to 5 cm. long, the corresponding leaves (excluding imperfect ones at base) well petioled, the largest 11 to 17 cm. long, the blades oblong or, especially below, narrowly obovate, 20 to 42 mm. wide, obtuse or apiculate, rather finely feather-veined, reticulate in the intervals, the margin entire or commonly with a few low teeth or crenations toward the summit, the petioles always margined, rather variable in length and breadth; remaining leaves subpetiolate nearly throughout, gradually reduced in length and breadth, entire; all the leaves slightly thick and somewhat coriaceous, rather firm, smooth except the margin, apparently rather green when fresh; inflorescence paniculate, narrowly ovoid or cylindraceous, 15 to 21 cm. long, sometimes reduced, rather loose, the slender branches placed at an angle of about 45 degrees, only a few of the longest racemes at all compounded, the bracts of the inflorescence linear to filiform, the pedicels slender, the longer 3 to 5 mm. long; heads narrowly campanulate, 5 to 6 mm. long; lower tegules oblong, the following linear-oblong, both ovate at the tip, rather thick and firm; disk flowers 5 to 7; ray flowers 5 to 9; rays oblong-oblancheolate; achenes very small, glabrous.

Type in the U. S. National Herbarium, no. 619303, collected at Michigan City, Laporte County, Indiana, August 12, 1909, by George L. Fisher (no. 107). On sand hills.

The National Herbarium has three other specimens from the same source, and a small specimen almost surely the same from sandy bluffs at Kilbourn, Wisconsin (August 26, 1909, *Steele* 40). The type sheet bears two large individuals.

***Solidago jejunifolia* Steele, sp. nov.**

Stem about 77 cm. high, light colored, striate-angled, smooth to the inflorescence, the summit with the branches thinly clothed with very short, coarse, ascending hairs; internodes 2 to 3 cm. long for nearly half the leafy segment, the upper moderately shorter, a few reduced to 1 cm.; longest leaves about the fourth to the sixth from the base, 7 to 8 cm. long, somewhat petiolate, the blade oblanceolate or lanceolate, 9 mm. wide, acute or nearly so, the petiole flat and rather broad, the leaves below shorter, a little broader and doubtless more blunt, the leaves above linear-oblancheolate, ovately acute at the tip, short-attenuate at the base; all the leaves rather thick, firmly coriaceous, hispidulous-

ciliate, otherwise smooth and glabrous, light colored; inflorescence about 20 cm. long, rather even in width, after pressing, 5 or 6 cm. wide, loose below, denser above, the branches slender, strongly ascending, the racemes with 7 to 12 heads, a few of the middle ones very slightly compounded, the peduncles slender, 2 to 4 mm. long; heads campanulate, 5 mm. long; involucre scarcely at all herbaceous, the tegules double-keeled but the lines not obviously looped above, the middle tegules oblong, ovately tipped; flowers about 17 to 20, of these 5 to 8 radiate, the rays oblanceolate-oblong, 2.5 mm. long; achenes glabrous.

Type in the U. S. National Herbarium, no. 619303, collected on Indian River, Cheboygan County, Michigan, August 8, 1890, by C. F. Wheeler.

Allied to *S. fisheri*, but differing conspicuously in its greatly reduced foliage and in its cylindraceous instead of ovoid inflorescence; also substantially in its lower stature and relatively stouter habit and in the slightly shorter but fuller heads. There is only one specimen, but the essential characters are entirely clear.