

A NEW SPECIES OF *STEPHANOMERIA* (ASTERACEAE) FROM NORTHWESTERN WYOMING

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ABSTRACT

Stephanomeria fluminea, a new species known only from northwestern Wyoming, is similar to the widespread *S. tenuifolia* (Torrey) H. M. Hall in characteristics of its heads, cypselae and pappus bristles, but has a distinct vegetative appearance because of its large cauline leaves that remain green at flowering. The new species grows only on raised, cobble benches in the shifting gravel beds of creeks and rivers, a habitat that is unique among all species of *Stephanomeria*.

Within *Stephanomeria* Nuttall, a widespread western North American genus of six annual and ten herbaceous perennial species, the reproductive structures, particularly the cypselae and pappus bristles, have provided the most useful characters to distinguish species. This is particularly so with the two perennial species *S. tenuifolia* (Torrey) H. M. Hall and *S. pauciflora* (Torrey) Nelson; for example, Cronquist (1994) states, "The only consistently dependable difference between the two lies in the pappus." Another notable example is the presence versus absence of a narrow, longitudinal groove or shallow channel on each face of the seeds that distinguishes *S. virgata* Benth. from all other annual stephanomerias (Gottlieb 1972). Emphasis on reproductive structures, though extremely valuable in this genus, has lessened attention to various vegetative traits.

Here, I describe a new species of *Stephanomeria* that closely resembles *S. tenuifolia* in characters of its heads, cypselae and pappus bristles. The new species has been collected since 1894, and generally was referred to this congener, but it differs markedly in vegetative appearance and, importantly, in its unusual and specialized habitat. The new species, known only from northwestern Wyoming, has large leaves all along its stems and branches that remain green at flowering whereas the cauline leaves of *S. tenuifolia* are very reduced and bract-like, rarely measuring as much as 15×1 mm. The new species grows only on impermanent, slightly raised, cobble benches in the flat, gravelly beds of creeks that flood and churn after spring snow melt, a habitat that is unique among all species of *Stephanomeria*. The habitats of *S. tenuifolia* are described as crevices in volcanic, granite and sandstone outcrops, open rocky ridges and slopes, and the bases of cliffs.

Stephanomeria fluminea Gottlieb sp. nov. (Fig. 1).—TYPE: USA, Wyoming, Teton Co., gravel bars in Pilgrim Creek, north of trailhead in Bridger-Teton National Forest, north of boundary with Grand Teton National Park, T46N R114W

sect. 20 E½, 7200 ft (2200 m), 15 Aug 1998, **Gottlieb and Ford 9807** (Holotype: DAV; Isotypes: COLO, MO, MONT, NY, RM, UC). $2n=16$ (from chromosome counts of root tip cells of two seedlings grown from seed collected at the type locality).

Ab *S. tenuifolia* (Torrey) H. M. Hall foliis caulinis magnis, viridibus sub anthesi, foliis ad ½ altitudines caulium (32–)35–46(–60) $\times$ 3–5 mm, foliis ad ⅓ altitudines caulium (28–)30–40(–50) $\times$ 2–3.5 mm, et habitatione distincta in lectis fluviorum differt.

It differs from *S. tenuifolia* in that the cauline leaves are large and green at anthesis, the leaves at half stem height are (32–)35–46(–60) $\times$ 3–5 mm, the leaves at ⅓ stem height are (28–)30–40(–50) $\times$ 2–3.5 mm, and its habitat in the beds of streams is distinctive.

Herbaceous perennials from creeping rhizomes; stems, branches and leaves densely short-tomentose throughout; stems 1–8, 15–40 cm. Basal leaves in a rosette, oblong-ob lanceolate, entire or very sparsely toothed; cauline leaves persistent along entire stem, (32–)35–46(–60) $\times$ 3–5 mm at ½ stem height, (28–)30–40(–50) $\times$ 2–3.5 mm at ⅓ stem height, green at flowering, oblong-ob lanceolate, margins entire. Heads terminal and axillary on peduncles 2–10 mm long. Involucre with 5 equal phyllaries, 8–10 mm long, subtended by a calyculus of bractlets 2–4 mm long. Receptacles epaleate. Florets 5(6). Cypselae tan, 4–4.4 mm, each face with a central, narrow, longitudinal groove, the faces smooth (not bumpy or rugulose) but with a scaberulous vestiture of minute upward pointing hairs, generally not ribbed between adjacent faces. Bristles of the pappus white, 30–40, plumose throughout, not widened at bases, occasionally connate in pairs at basal 0.1–0.2 mm, otherwise free, persistent.

Representative specimens. Wyoming, Park Co. **Hartman 19617** (RM), 27 Aug 1984, S. Fk. Shoshone R. between Robinson and Younts Crs.; Sub-

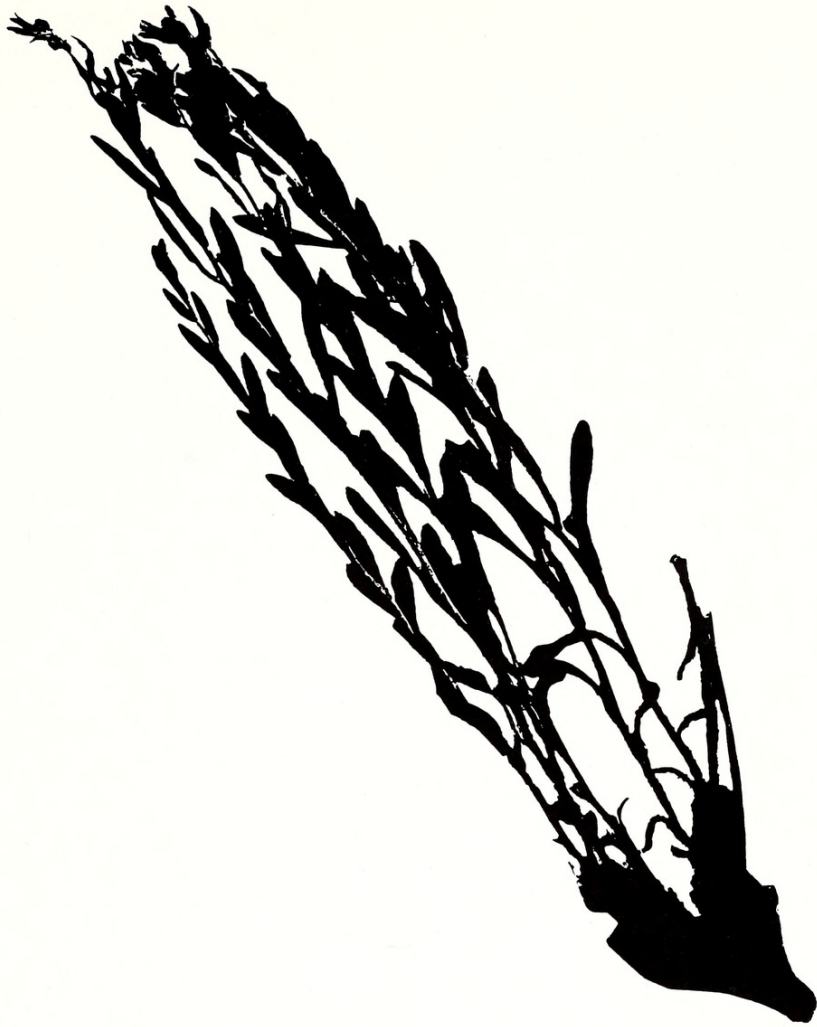


FIG. 1. Silhouette of *Stephanomeria fluminea*.

lette Co. **Payson and Payson 3076** (RM), 19 Aug 1922, Hoback R. Canyon near Cliff Cr.; Teton Co. **Beetle 5062** (WSC, WTU), 11 Aug 1947, 5 mi N of Moran; **Dorn 4726** (COLO, NY, RM), 28 July 1987, Pacific Cr.; **Evert 32257** (RM), 25 July 1996, Pilgrim Cr.; **Fertig 16286** (RM), 13 Aug 1995, Cottonwood Cr., Fish Cr. drainage; **Gottlieb and Ford 9803** (DAV, GH, MO, NY, RM, UC), 13 Aug 1998, Pacific Cr.; **Hartman 28285** (RM), 25 Aug 1990, S. Fk. Fish Cr. between Purdy and Hackamore Crs.; **A. Nelson 925** (RM, UTC), 15 Aug 1894, Bacon Cr., Fish Cr. drainage; **B. E. Nelson 20332** (RM), 25 Aug 1990, S. Fk. Fish Cr.; **Reed 1065** (RM), 10 Aug 1947, Pacific Cr.; **N. Snow 1386** (RM), 23 July 1987, Pacific Cr.; **Venrick 366** (MO), 13 Aug 1960, Pacific Cr.; **L. Williams 320** (RM), 3 Aug 1931, Snake River bottom, Jackson Hole; **L. Williams 976** (GH, MO, NY, RM, UTC), 31 July 1932, Snake River bottom gravel.

All but one of the known populations of *S. fluminea* are located in channels of creeks and rivers that flow westerly into the Snake River in the general region of Jackson Hole, Wyoming. A single collection is from a different drainage: **Hartman 19617** from east of the continental divide in the channel of the South Fork of the Shoshone River.

In the summer of 1998, the population in the Pilgrim Creek type locality included between 1000 and 2000 plants, and the one at the collection site in Pacific Creek numbered between 250 and 500 plants. All individuals examined in these populations had large cauline leaves.

Other populations, however, growing in creek beds to the south, had numerous individuals with shorter, more narrow leaves that appear to be intermediate in size between those of *S. fluminea* and the very reduced bractlike leaves of *S. tenuifolia*. For example, plants with intermediate leaf sizes were collected at Spread Creek near Hwy. 26/89/191 (**Gottlieb and Ford 9810**, DAV), the Gros Ventre River near Hwy. 26/89/191 (**Gottlieb and Ford 9806**, DAV), and Fish Creek (**Gottlieb and Ford 9805**, DAV), in the upper Gros Ventre drainage, 34 miles east of Hwy. 26/89/191. At Fish Creek, cauline leaves on seven plants averaged 28.1×1.9 mm at $\frac{1}{2}$ stem height and 19.7×1.1 mm at $\frac{2}{3}$ stem height. On the Gros Ventre River, just east of the highway bridge on Hwy. 26/89/191, cauline leaves on seven plants averaged 36.0×1.4 mm at $\frac{1}{2}$ stem height and 23.4×0.9 mm at $\frac{2}{3}$ stem height. Specimens probably collected from the same Gros Ventre site in 1933 (**L. Williams 1321**, MO and

UTC) had cauline leaves less than 20×1.5 mm. Intermediate dimensions were also evident on the cauline leaves on some specimens in another collection of Williams from the Snake River bottom in Jackson Hole (976, acc. 161207, RM), but other specimens from the same collection (*Williams* 976, GH, NY, RM, and UTC) show large cauline leaves, typical of *S. fluminea* as well as several with leaves having intermediate sizes. The shorter and narrower leaves on plants from these localities and their greater variability suggest they might be a consequence of interspecific hybridization between *S. fluminea* and *S. tenuifolia*.

Stephanomeria tenuifolia, though apparently not common in the region, has been collected (*Weh-meyer, Martin, and Loveland* 5414, GH, MO, NY) from near Red Hill Bridge over the Gros Ventre River, about 15 miles east of Hwy. 26/89/191. Many other collections of *S. tenuifolia* have been made along both the North Fork and the South Fork of the Shoshone River in adjacent Park County, to the north and east of Jackson Hole (for example, *Hartman* 59574, 54931 and 60004; *Rosenthal* 2221; *Evert* 8796, 9504 and 9423; all RM). The two species can be expected to make contact at numerous places in the region where creeks flow beneath rocky cliffs and other outcrops.

Individual genotypes of *S. fluminea* are probably often multiplied when their rhizomes are broken apart as the cobbles beneath them shift and grind during spring floods. These fragments can be moved to new sites where they may reroor. Indeed, rhizomes that reroor would seem to be particularly adaptive in the rocky creek bed habitat of this species. At Pacific Creek, we found plants with shoots

that emerged from large, multi-year root crowns and that had at least one previous year's dried stems still attached as well as plants with shoots growing from slender rhizomes with no evidence of previous shoot growth. In addition, we found several plants as much as 15 cm apart above ground that arose from a common rhizome.

All of the creek bed habitats where *S. fluminea* is now found were covered 18,000 to 20,000 years ago by the massive Pinedale glacier (Good and Pierce 1996), suggesting the possibility that the species evolved relatively recently after the glacier retreated.

ACKNOWLEDGMENTS

I thank Ellen Dean, director of the University of California, Davis, herbarium, for her helpfulness and the many courtesies she extended to me while I was preparing the taxonomic treatment of *Stephanomeria* for the Flora of North America. I thank John L. Strother for many helpful comments on the original manuscript, and both him and Alan R. Smith for translating the species diagnosis into Latin. I thank the curators of the following herbaria for loans of specimens: COLO, GH, IDS, MO, MONT, MON-TU, NY, RM, UTC.

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