

PSEUDOSTELLARIA OXYPHYLLA (CARYOPHYLLACEAE), A LONG OVERLOOKED SPECIES FROM NORTHERN IDAHO

Ronald L. Hartman

Rocky Mountain Herbarium
Department of Botany
University of Wyoming
Laramie, Wyoming 82071-3165, U.S.A.
rhartman@uwyo.edu

Richard K. Rabeler

University of Michigan Herbarium
3600 Varsity Drive
Ann Arbor, Michigan 48108-2287, U.S.A.
rabeler@umich.edu

ABSTRACT

Stellaria oxyphylla B.L. Rob. has been rediscovered in northern Idaho; a taxon rarely noted in the literature since its original description in 1898. Our study indicates that *Stellaria oxyphylla* is congeneric with *Pseudostellaria*, thus the new combination is provided. The three western North American members of *Pseudostellaria* have six capsular valves that dehisce by rolling back tightly 2 or 3 revolutions, forming a shallow dish, thus exposing the seeds. *Pseudostellaria oxyphylla* differs from *P. sierrae* Rabeler & R.L. Hartman and *P. jamesiana* (Torr.) W.A. Weber & R.L. Hartman in having internodal lines of hairs (0.5–5 mm wide) on the stems and branches of the inflorescences, but like the last taxon, the stems of *P. oxyphylla* are square in cross section. In general appearance, *P. oxyphylla* is most similar to *P. jamesiana*, the congener widely distributed in the western United States. *Pseudostellaria oxyphylla* and *P. sierrae* share a reduction in stamen number from 10 to 5 and seeds with elongate, rounded tubercles each with 5 to 12 or more minute stipitate glands or conical projections, respectively. *Pseudostellaria oxyphylla* is found along stream banks, often under and near conifers.

RESUMEN

Se ha redescubierto *Stellaria oxyphylla* B.L. Rob. en el norte de Idaho; un taxon raramente presente en la bibliografía desde que se describió en 1898. Nuestro estudio indica que *Stellaria oxyphylla* es congénica con *Pseudostellaria*, por lo que se hace una nueva combinación. Los tres miembros del oeste de Estados Unidos de *Pseudostellaria* tienen seis valvas en su cápsula, que se abre enrollándose hacia atrás 2 ó 3 vueltas, formando un plato plano, exponiendo de este modo las semillas. *Pseudostellaria oxyphylla* difiere de *P. sierrae* Rabeler & R.L. Hartman y *P. jamesiana* (Torr.) W.A. Weber & R.L. Hartman por tener líneas de pelos internodales (0.5–5 mm de ancho) en los tallos y ramas de las inflorescencias, pero como el último taxon, los tallos de *P. oxyphylla* son cuadrados en sección transversal. En su aspecto general, *P. oxyphylla* es más semejante a *P. jamesiana*, el congénere ampliamente distribuido en el oeste de los Estados Unidos. *Pseudostellaria oxyphylla* y *P. sierrae* comparten una reducción en el número de estambres de 10 a 5, y semillas con tubérculos alargados y redondeados, cada uno con 5 a 12 o más glándulas estipitadas diminutas o proyecciones cónicas, respectivamente. *Pseudostellaria oxyphylla* se encuentra a lo largo de los bancos de torrentes, a menudo debajo y cerca de coníferas.

Stellaria oxyphylla B.L. Rob. has rarely appeared in the literature since it was described in 1898. Most recently, the taxon was relegated to synonymy under *Stellaria calycantha* (Ledeb.) Bong. as C.L. Hitchcock considered it "the robust extreme" of that taxon (Hitchcock et al. 1964). Rabeler (1986) considered *Stellaria oxyphylla* distinct from the *S. calycantha* complex and placed it tentatively

under *Pseudostellaria jamesiana* (Torr.) W.A. Weber & R.L. Hartman. Our recent collaboration on the Caryophyllaceae for Flora of North America (Hartman & Rabeler in prep.), necessitates that we resolve the taxonomic status of this plant. Recent field work has provided new material and information on the geographic and ecological distribution of this taxon. Populations of *P. oxyphylla* appear restricted to stream margins in the St. Joe Mountains, Kootenai and Shoshone counties, Idaho, an area where *P. jamesiana* is absent. It likely represents a taxon of conservation concern but intensive field studies are warranted.

After studying the available material of *Stellaria oxyphylla* again, especially in light of our recent description of *Pseudostellaria sierrae* Rabeler & R.L. Hartman and its relationship to *P. jamesiana* (Rabeler & Hartman 2002), we conclude that these species are congeneric. We here make the following new combination, *Pseudostellaria oxyphylla* (B.L. Rob.) R.L. Hartman & Rabeler. The description, illustration (Fig. 1), and geographic and ecological notes supplement the only other published account of the species—the type description.

We investigated the relationship between the North American and Asian species of *Pseudostellaria* when *P. sierrae* was described (Rabeler & Hartman 2002); an overview of the genus can also be found in that article. At least one synapomorphy unites the western United States members of *Pseudostellaria*: six capsular valves that dehisce by rolling back tightly 2 or 3 revolutions, forming a shallow dish exposing the basal placentae with 1 or 2 seeds that may persist, at least briefly, prior to dispersal. In general appearance, *P. oxyphylla* is most similar to *P. jamesiana*. *Pseudostellaria oxyphylla* and *P. sierrae* share a reduction in stamen number from 10 to 5 and have seeds with elongate, rounded tubercles each having 5 to 12 minute stipitate glands or conical projections, respectively. All three taxa have rhizomes with occasional axillary buds, but unlike *P. oxyphylla*, *P. jamesiana* has tuberous thickenings of the rhizomes, while *P. sierrae* has tuberous, cigar-like thickened roots. Considerable excavation of the rhizomes of several plants of *P. oxyphylla* did not reveal additional perennating structures. Unfortunately, very few fully mature seeds are preserved for these taxa on herbarium specimens; this is especially true for *P. jamesiana*. Unlike *P. sierrae* (northern California) and *P. jamesiana* (widespread), with geographical ranges that overlap in part, *P. oxyphylla* appears to be disjunct from the latter taxon.

Pseudostellaria oxyphylla (B.L. Rob.) R.L. Hartman & Rabeler, comb. nov. (**Fig. 1**). BASIONYM: *Stellaria oxyphylla* B.L. Rob., Bot. Gaz. (Crawfordsville) 25:165, pl. 13, fig. 5, 1898. *Alsine oxyphylla* (B.L. Rob.) A. Heller, Cat. N. Amer. pl., ed. 2, p. 4. 1900. TYPE: U.S.A. IDAHO. KOOTENAI CO.: on St. Joseph's River [?], Wies[s]ner's Peak, Sandberg, MacDougal, and Heller 608, 8 Jul 1892 (fl), 1,800 m (HOLOTYPE: GH!; ISOTYPES: CAS!, NY!, PH!, POM!, US!).

Perennial, mostly glabrous herb, erect to sprawling, 20–25 cm tall, with stems arising singly, at varying intervals, along rhizomes. Roots vertical to spreading, filiform, 1–8 cm long or more; rhizomes often extensive, branched, whitish to

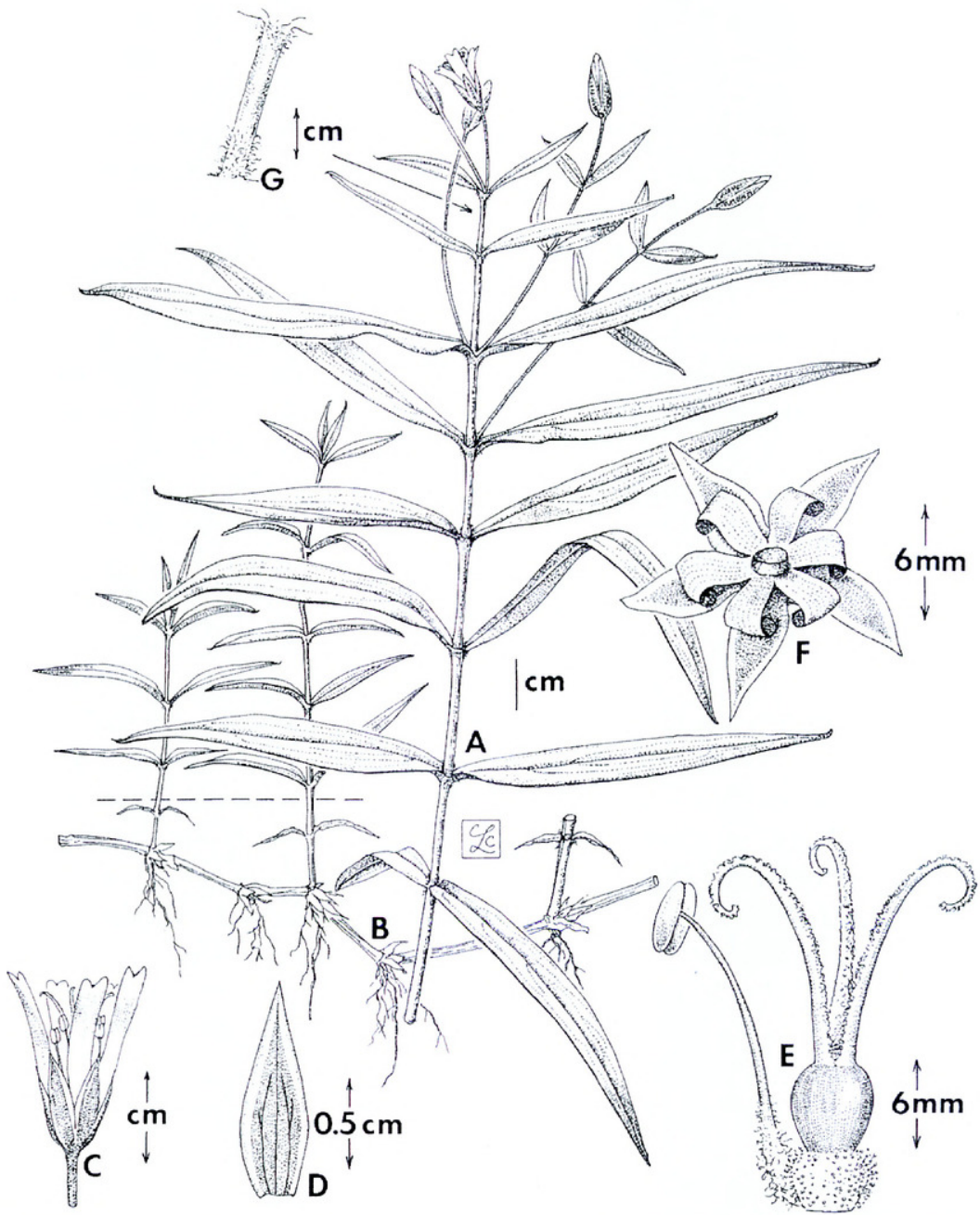


FIG. 1. *Pseudostellaria oxyphylla*. A. and B., habit, the stem in A. detached from the base with rhizome, to the right in B. C. Flower. D. Sepal. E. Gynoecium with one stamen attached. F. Capsule, dehiscent, with subtending calyx. G. Upper internode, side opposite the internodal line of pubescence.

tan, square in cross section to rounded with age, 0.5–1 mm in diameter, shiny, internodes 0.1–2 cm long or more, when internodes contracted achlorophyllous bracts often dense, overlapping, axillary buds 2–3 mm long. Stems mostly simple, square in cross section, internodes 1–5 cm long or more below, 1–2.5 cm long in inflorescence, glabrous except for a dense, internodal line of pubescence, 0.5–5 mm wide, trichomes straight to curly, most recurved, uniseriate of 5–9

elongate cells (possibly somewhat glutinous as evidenced by debris adhering to older material). Leaves opposite, sessile, the primary leaves 8–11 pairs on main stem, lanceolate to lance-elliptic, ascending to spreading, $6\text{--}12 \times 0.7\text{--}1.2$ cm, little reduced above, exstipulate, bases connate with transverse margin 0.3–0.6 mm wide, leaf surface flat, often pustulate ($30\times$), margins often revolute, smooth to granular or sometimes papillate, sparsely ciliate proximally, midrib often sparsely pubescent adaxially, smooth, shiny, and often prominent abaxially. Inflorescence consisting of paired flowers, or one abortive, on pedicels often terminating secondary branches in the distal 3–7 axils, progressively reduced upward from pairs of normal leaves to scarious bracts, lanceolate to linear-lanceolate, 2–10 mm long; pedicels 1.5–4.5 mm long. Flowers perfect, chasmogamous, regular; sepals, inner lanceolate, outer narrowly ovate, $6.5\text{--}7 \times 1.5\text{--}2.5$ mm, glabrous, margins narrowly scarious, ciliolate in proximal half, midrib and lateral pair of nerves obscure, becoming evident in fruit, acute to acuminate, in fruit proximal $1/5$ of sepals often with a thickened, elliptical patch; petals 5, white, strap-shaped, expanding to twice the width distally, $8\text{--}9 \times 1.5\text{--}2$ mm, broadly notched, notch 0.8–1 mm deep, the lobes rounded; stamens 5, each with a circular, thickened, basal gland 2–2.5 times the filament width, alternating with the petals, filaments 4–4.5 mm long, anthers yellow; ovary 3-carpellate, with 6–12 ovules; styles 3, 3.5–4 mm long, stigma terminal and adaxial, linear, minutely papillate ($30\times$). Capsule ovoid, 4–4.5 mm long; valves 6, dehiscing by rolling back tightly 2–3 revolutions, forming a shallow dish exposing the basal placentae and plump funiculi. Seeds 1–2, reddish-brown, 2.5–2.6 mm long, circular, plump, radicle prominent, mature seeds with most tubercles broadly conical to elongate, rounded, interdigitating, each with 8–12 or more stipitate glands ca. 0.015 mm long or less ($50\times$).

During the August visit to Pine Creek, most of the inflorescences were brown; most of the fruit aborted. This is likely a consequence of the dry summer. Similarly, it is very difficult to find fruiting material and seeds of *Pseudostellaria jamesiana*, in part because the fruits and seeds frequently abort or mature late in the fall and thus are seldom collected.

While this species has been known for over a century, to our knowledge it had been collected only twice, and never in fruit. The only collection subsequent to the type was gathered by J.H. Christ in 1940 (*Christ 10949*, NY). In August of 2000, Hartman relocated it and returned in June of 2001 to obtain additional material. The known geographic range appears restricted to the St. Joe Mountains and vicinity: extreme west-central Shoshone and southeastern Kootenai counties, Idaho.

Specimens examined: U.S.A. **Idaho. Kootenai Co.:** St. Joseph River [?], Wies[s]ner's Peak, 1,800 m., 8 Jul 1892, Sandberg, MacDougal, & Heller 608 (HOLOTYPE: GH; ISOTYPES: CAS, NY, PH, POM, US); Pine Creek, just before Middle Fork Pine Creek, on jeep trail to Mount Wiessner, T47N R1E S15, 2,800 ft., 25 Aug 2000, Hartman 70411 (MICH, MONT, RM); Pine Creek, 0.5 air mi NE of Middle Fork Pine Creek, T47N

R1E S12, 2,700 ft., 25 Aug 2000, *Hartman 70410* (MICH, RM), 12 Jun 2001, *Hartman 71073* (ID, MICH, NY, RM, UC, WTU). **Shoshone Co.:** cliffs along St. Joe River, 7 mi N of Calder, 19 May 1940, *Christ 10949* (NY).

The only floristic work that treats *Stellaria oxyphylla* as a recognized taxon is the unpublished "Manual of the Flora of Northern Idaho" by Carl Epling and Joseph Ewan dated 1941 (page 258 of 1121 page manuscript, original at MO; copies at RM, UC, provided by Alan Whittemore).

Several locations were visited along the St. Joseph River, including the segment in the vicinity of Christ's collecting site, but *Pseudostellaria oxyphylla* was not relocated. The habitat is given as "cliffs," perhaps at their bases. According to the late Douglass Henderson, "Christ's labels are to be viewed as "probably inaccurate"" (letter to Rabeler, Sep 1987).

After Hartman discovered populations of the taxon along Pine Creek, south of Pinehurst, he hiked the switchbacks from the southwest to the saddle, ca. 6,000 feet elevation, between Latour Peak (6,408 feet) and Mount Wiessner (6,185 feet). Neither suitable habitat for nor populations of *Pseudostellaria oxyphylla* was encountered on the slopes and drainages.

ECOLOGY

Pseudostellaria oxyphylla appears restricted to banks along perennial streams and rivers and adjacent moist sites; often under conifers or at the edge of coniferous forests. Due in part to an often extensive rhizome system, 20 to 100 or more flowering stems were found scattered in these sites that often dry out over the summer. On Pine Creek, the scattered populations were found over a 2.5 mile stretch of the creek valley.

ACKNOWLEDGMENTS

We wish to thank Carolyn Crawford for the illustration and the curators of CAS, GH, NY, PH, POM, and US for loans to Rabeler, ID, MONT, MONTU, WS for loans to Hartman, and CAS, MO, and UC for visits by Hartman and Rabeler.

REFERENCES

- HITCHCOCK, C.L., A. CRONQUIST, M. OWNBEY, and J.W. THOMPSON. 1964. Vascular plants of the Pacific Northwest. Part 2. Univ. Wash. Publ. Bot. 17(2):1–597.
- RABELER, R.K. 1986. Revision of the *Stellaria calycantha* (Caryophyllaceae) complex and taxonomic notes on the genus. Ph.D. diss., Michigan State Univ., East Lansing.
- RABELER, R.K. and R.L. HARTMAN. 2002. *Pseudostellaria sierrae* (Caryophyllaceae), a new species from California. *Novon* 12:82–86.
- ROBINSON, B.L. 1898. New species and extended ranges of North American Caryophyllaceae. *Bot. Gaz. (Crawfordsville)* 25:165–171.



Hartman, Ronald L and Rabeler, Richard K. 2004. "PSEUDOSTELLARIA OXYPHYLLA (CARYOPHYLLACEAE), A LONG OVERLOOKED SPECIES FROM NORTHERN IDAHO." *SIDA, contributions to botany* 21, 175–179.

View This Item Online: <https://www.biodiversitylibrary.org/item/34585>

Permalink: <https://www.biodiversitylibrary.org/partpdf/163450>

Holding Institution

Missouri Botanical Garden, Peter H. Raven Library

Sponsored by

Missouri Botanical Garden

Copyright & Reuse

Copyright Status: In copyright. Digitized with the permission of the rights holder.

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.