Engellaria (Caryophyllaceae), a new North American genus segregated from Stellaria

Engellaria (Caryophyllaceae), un nuevo género norteamericano segregado de Stellaria

Abstract:

**Background and Aims:** Stellaria traditionally comprises 150-200 species, mainly distributed in the temperate regions of Eurasia and North America. Molecular studies demonstrated that Stellaria is polyphyletic and includes about 120 species. The genus has a high phenotypic variability which has led to nomenclatural disorders, making the identification of the various species difficult. A note is presented about a taxon currently accepted under the genus Stellaria - *Stellaria obtusa* - which should be recognized as a separate genus, here proposed as Engellaria gen. nov.

**Methods:** This study is based on examination of specimens of American and European herbaria and analysis of relevant literature.

**Key results:** Available molecular data show that *Stellaria obtusa* is not included in the Stellaria s.s. clade, but instead is basal to another clade comprising the genera Honkenya, Schiedea, and Wilhelmsia. *Stellaria obtusa* was, therefore, compared with these three groups and with morphologically similar apetalous members of *Stellaria* s.s. (*S. crispa*, *S. media*, *S. pallida*, and *S. irrigua*). The results obtained lead to the recognition of *S. obtusa* as a separate new North American monotypic genus. A diagnostic key of the apetalous members belonging to the American Caryophyllaceae genera is proposed. Finally, the names *Stellaria obtusa* and *S. washingtoniana* (= *S. obtusa*) are lectotypified based on specimens deposited, respectively, at UC (isolateotypes at GH, NY, and YU) and GU (isolateotypes at BM, CAN, CAS, CS, DOV, F, GH, K, MIN, MSC, NY, US, and VT). For the name *Alsine viridula* (= *S. obtusa*) the holotype was found at US (isotypes at CAS, F, GH, NY, OSC, RM, and UC).

**Conclusions:** *Stellaria obtusa* does not belong to the genus *Stellaria*. The present study shows that the combined use of morphological data and phylogenetic analyses helped to clarify the taxonomic position of difficult plant groups, as in *Stellaria*.

**Key words:** *Engellaria obtusa*, molecular data, morphology.

Resumen:

**Antecedentes y Objetivos:** Stellaria tradicionalmente incluye 150-200 especies principalmente distribuidas en las regiones templadas de Eurasia y América del Norte. Estudios moleculares mostraron que Stellaria es polifilética e incluye aproximadamente 120 especies. El género tiene una alta variabilidad fenotípica que ha llevado a desórdenes nomenclaturales lo que dificulta la identificación de las diversas especies. Se presenta una nota sobre un taxón actualmente aceptado bajo el género Stellaria - *Stellaria obtusa* - que debe reconocerse como un género separado, aquí propuesto como Engellaria gen. nov.

**Métodos:** El trabajo está basado en la revisión de especímenes de herbarios americanos y europeos y en el análisis de la literatura.

**Resultados clave:** Datos moleculares disponibles muestran que *Stellaria obtusa* no está incluida en el clado Stellaria s.s., pero que es basal a otro clado que comprende los géneros Honkenya, Schiedea y Wilhelmsia. *Stellaria obtusa*, por lo tanto, fue comparada con estos tres grupos y con los miembros apétalos morfológicamente similares de Stellaria s.s. (*S. crispa*, *S. media*, *S. pallida* y *S. irrigua*). Los resultados obtenidos conducen al reconocimiento de *S. obtusa* como un nuevo género monotípico norteamericano separado. Se propone una clave diagnóstica de los miembros apétalos pertenecientes a los géneros americanos de Caryophyllaceae. Finalmente, los nombres *Stellaria obtusa* y *Stellaria washingtoniana* (= *S. obtusa*) se lectotypifican basado en especímenes depositados, respectivamente, en UC (isolateotypes en GH, NY y YU) y GU (isolateotypes en BM, CAN, CAS, CS, DOV, F, GH, K, MIN, MSC, NY, US y VT), respectivamente. Para el nombre *Alsine viridula* (= *S. obtusa*) el holotipo se encontró en USA (isotypes en CAS, F, GH, NY, OSC, RM y UC).

**Conclusiones:** *Stellaria obtusa* no pertenece al género Stellaria. El presente estudio muestra cómo el uso combinado de datos morfológicos y análisis filogenéticos ayudó a aclarar la posición taxonómica de grupos de plantas difíciles, como Stellaria.

**Palabras clave:** datos moleculares, Engellaria obtusa, morfología.

1University of Rome Sapienza, Department of Planning, Design, and Technology of Architecture, via Flaminia 72, 00196 Rome, Italy.

2Author for correspondence: d.iamonico@yahoo.it

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Introduction

*Stellaria* L. (Caryophyllaceae) is a genus traditionally comprising 150-200 species distributed in the temperate regions of Eurasia and North America and at the higher altitudes of tropical areas (Hernández-Ledesma et al., 2015; Tikhomirov, 2016), being most diverse in the mountains of central Asia (Sharples and Tripp, 2019). Based on recent molecular studies (Greenberg and Donoghue, 2011; Sharples and Tripp, 2019), it was shown that various species are not included in the *Stellaria sensu stricto* clade. In light of this new view, *Stellaria* s.s. should be reduced to about 120 species (Morton, 2005) to 112 (Sharples, 2019). The genus is taxonomically problematic because of its high phenotypic variability which has led to nomenclatural disorders making the identification of the various species difficult. A worldwide revision of *Stellaria* is still lacking. Taxonomic studies of *Stellaria* were mostly part of comprehensive floras: Clapham et al., 1952 (for the British Isles), Chater and Heywood, 1993 (for Europe), Wu and Ke, 1996 and Shilong and Rabeler, 2001 (for China) or Morton, 2005 (for North America). In addition, few molecular papers have been published (e.g., Greenberg and Donoghue, 2011; Sharples and Tripp, 2019; Sharples, 2019).

As part of my ongoing studies on Caryophyllaceae (e.g., Iamonico 2013, 2014, 2015, 2018; Iamonico and Donina, 2015), I here present a note about a taxon currently accepted under the genus *Stellaria* - *Stellaria obtusa* Engelm. - which, however, should be removed and recognized as a separate genus, which I name *Engellaria* gen. nov. (see the taxonomic treatment).

Material and Methods

The present research is based both on the analysis of the relevant literature and examination of specimens preserved at BM, CAN, CAS, CS, DOV, F, GH, HFLA, K, MIN, MO, MSC, NEBC, NY, OSC, RM, UC, US, VT, and YU (herbarium acronyms according to Thiers, 2021 (continuously updated)).

The distribution map was based on data from herbarium specimens and the following online sources: Hartman and Rabeler (2012), and EOL, 2020 (continuously updated). The following characters, which are relevant for the studied taxa according to literature (mainly Morton and Rabeler, 1989) and personal experience, were measured on the examined specimens (or images; see “Additional examined material”) using a millimeter ruler and an optical stereoscope Olympus SZ40 (Schönwalde-Glienicke, Germany): length and width of the leaves (the width was measured at the widest part of the blade), size of the seeds (both longest and shortest diameter), ratio length/width of the leaf blades, and fruit dehiscence/indehiscence.

Results and Discussion

Phylogenetic data from the literature

Greenberg and Donoghue (2011: 1642-1643) demonstrated that *Stellaria* is polyphyletic, highlighting that several taxa are not included in the *Stellaria sensu stricto* clade, but they are instead related to other genera, i.e. *Geoarpom* Mack., *Honkenya* Ehrh., *Lepyrodictis* Fenzl ex Endl., *Minuaria* Loefl., *Schiedea* Cham. & Schtl., and *Wilhelmsia* Rchb. The non-*Stellaria* species *sensu Greenberg and Donoghue* (2011: 1642, Fig. 2) occur, in their cladogram, in two different and not closely related clades, i.e., clade no. 10 (which corresponds to the tribes Scleranthaceae Bercht. & J. Presl (see Reveal, 2011 for the correct citation of this name) and Saginaceae J. Presl as recognized by Harbaugh et al. (2010)) and clade no. 15 (which corresponds to the tribe Alsinaceae as recognized by Harbaugh et al. (2010)). Among these divergent species, *Stellaria obtusa* appears to be least related to the rest of the *Stellaria* members, being part of the tribe Scleranthaceae *sensu Harbaugh et al. (2010)* and sister to a clade comprising the genera *Honkenya*, *Schiedea*, and *Wilhelmsia* (see Greenberg and Donoghue, 2011: 1642, Fig. 2). This latter clade is sister to another well-supported clade (bootstrap value=97) including nine species. Six out of these nine latter species were later recognized as part of the following two other genera: *Mononeuria* Rchb. (*M. cumberlandensis* (Wofford & Kral) Dillenb. & Kadereit (≡ Arenaria cumberlandensis Wofford & Kral), *M. glabra* (Michx.) Dillenb. & Kadereit (≡ Arenaria glabra Michx.), *M. minima* (Mack.) Dillenb. & Kadereit (≡ Geocarpon minimum Mack.), *M. nuttallii* (Torr. & A. Gray) Dillenb. & Kadereit (≡ Stellaria nuttallii Torr. & A. Gray), *M. uniflora* (Walter) Dillenb. & Kadereit (≡ Stellaria uniflora Walter)) and *Triplateia* Bartl. (*Triplateia moehringioides* (Moç. & Sessé ex DC.) Kuntze (≡ Hymenella moehringioides Moç. & Sessé ex DC.)). The other three taxa (*S. minutifolia* Maguire, *S. ovata* Willd.}
ex D.F.K. Schltdl, and S. howardii Maguire) are still considered as part of the genus *Stellaria* but, according to Dillenberger and Kadereit (2014: 68), they form a clade (no. 4 in Dillenberger and Kadereit, 2014) which is sister to some *Minuartia* members. They need further study and are part of an ongoing study by the author of the present paper (Iamonico, in prep.).

**Morphological data**

Comparison of *Stellaria obtusa* with molecularly closely related genera (*Honckenya*, *Schiedea* and *Wilhelmsia*)

*Honckenya* is a monotypic genus native to the coastal areas of temperate and arctic North America, as well as northern Eurasia (Halliday, 1993; Wagner, 2005b; Sánchez Vilas, 2007: 21). The single morphologically variable species *H. peploides* (L.) Ehrh. is comprised of four subspecies, distinguished by habit, stem diameter, internode length, leaf shape and size, and pedicel length (Wagner, 2005b): subsp. *diffusa* (Hornem.) Hultén ex V.V. Petrovsky, subsp. *major* (Hook.) Hultén, subsp. *peploides*, and subsp. *robusta* (Fern.) Hultén (see Kurtto, 2001; Wagner, 2005b). As a whole, *H. peploides* is clearly a different lineage from *Stellaria obtusa*, displaying the following diverging characters between *H. peploides* and *S. obtusa*: size of leaves (up to 46 × 20 mm in *H. peploides* vs. up to 12 × 12 mm in *S. obtusa*), inflorescence (few-flowered inflorescence in *H. peploides* vs. always solitary in *S. obtusa*), sepals (5 in *H. peploides*, usually 4 in *S. obtusa*), petals (present in *H. peploides*, absent in *S. obtusa*), length of sepals (3.5-7 mm in *H. peploides* vs. 1.5-3.5 mm in *S. obtusa*), length and dehiscence of capsule (up to 2-3.5 mm opening by 6 valves in *H. peploides* vs. up to 0.5-0.7 mm in *S. obtusa*).

*Schiedea* is a genus endemic to the Hawaiian Islands (Wagner et al., 2005). All *Schiedea* species are characterized morphologically by having various features which clearly distinguish this genus from *Stellaria obtusa* (Table 1). These features refer to habit (shrubs, subshrubs and vines vs. perennial herbs in *S. obtusa*), leaves (entire to minutely toothed vs. entire in *S. obtusa*), inflorescence architecture (dichasia, monochoasia or paniculate-like vs. flowers axillary and solitary in *S. obtusa*), and seed size (diameter: 0.6-1.8 mm in *Schiedea* vs. up to 0.5-0.7 mm in *S. obtusa*).

*Wilhelmsia* is a monotypic genus occurring in arctic northwestern North America (Canada in Northwest Territories and Yukon, and USA in Alaska) and eastern Asia (Russian Far East, Siberia) (Wagner, 2005a). The single species, *W. physodes* (Fisch. ex Ser.) McNeill, differs from *Stellaria obtusa* in several characters, i.e. pubescence (respectively, glandular pubescent vs. glabrous to finely pubescent), leaf size (2-8 × 5-15 mm in *W. physodes* vs. 7-12 × 2-12 mm in *S. obtusa*), petals (present in *W. physodes*, absent in *S. obtusa*), sepal length and colour (4.5-6 mm, often purple in *W. physodes* vs. 1.5-3.5 mm, green in *S. obtusa*), capsule width, colour and dehiscence (7-10 mm, purplish opening by 3 valves in *W. physodes* vs. 1-2 mm, green to pale-green opening by 6 valves in *S. obtusa*), and seed diameter (1.2-1.5 mm in *W. physodes* vs. 0.5-0.7 mm in *S. obtusa*) (Table 1).

Comparison of *Stellaria obtusa* with apetalous *Stellaria* sensu stricto members

*Stellaria obtusa*, an apetalous species, displays a unique morphology among the apetalous *Stellaria* species (*S. crispa* Cham. & Schltdl., *S. dicranoides* (Cham. & Schltdl.) Fenzl (Fenzl’s species is here accepted as a member of *Stellaria* according to the treatment by Morton (2005) who, however (see also Harbaugh et al., 2010: 195), reported that *S. dicranoides* is of uncertain generic position and it could be placed under the genus *Arenaria* L.), *S. media* L. s.l., *S. pallida* (Dumort.) Crép., *S. irrigua* Bunge (= *S. umbellata* Turcz. according to Sharples and Tripp, 2019) (Table 2). *Stellaria crispa* usually has longer leaves (4-25 mm vs. 7-12 in *S. obtusa*), acute to acuminate sepals with 3 prominent veins (vs. obtuse with obscure veins in *S. obtusa*), styles that are about 1 mm long (vs. <0.5 mm long in *S. obtusa*), and ovoid capsules that are more than 1.5 times as long as wide (vs. globose).

*Stellaria media* is a highly variable species. The forms having flowers without petals differ from *S. obtusa* by the following characters: stems pubescent all around or with 1-2 lines of hairs (vs. stems glabrous (rarely hairy)), larger leaves (10-20 × 5-10 mm vs. 7-12 × 2-12 mm in *S. obtusa*), inflorescences 5- to many-flowered (vs. flowers solitary in *S. obtusa*), sepals pubescent (vs. glabrous), larger seeds...
**Engellaria** Iamonico gen. nov.

**TYPE:** *Engellaria obtusa* (Engelm.) Iamonico (basionym: *Stellaria obtusa* Engelm.).

*Engellaria* includes perennial herbs which display entire leaves, solitary flowers, usually 4 sepals (rarely 5), green, 1.5-3.5 mm long, petals absent, styles 0.3-0.5 mm long, capsule dehiscent by 6 valves, pale-green, 2-3.5 mm long, 1-2 mm wide, seeds 0.5-0.7 mm in diameter.

Distribution: see the description of *Engellaria obtusa*.

Etymology: my first idea was to dedicate the new genus to George Engelmann (1809-1884), an American physician and botanist who first described *Stellaria obtusa*, the single member of *Engellaria*. However, the name *Engelmannia* (derived from the surname Engelmann) has been published four times (*Engelmannia* A. Gray ex Nutt. (in 1840), *Engelmannia* Klotzsch (in 1841), *Engelmannia* Torr. & A. Gray (in 1842), *Engelmannia* Pfeiff. (in 1845)) and

### Taxonomic treatment

Based on the discussion above about molecular data and morphology of *Stellaria obtusa* and the related taxa, I here propose a new monotypic genus in the Caryophyllaceae. See Table 1 for a comparison with the similar genera.

| Engellaria Iamonico | Honckenyia Ehrh. | Schiedea Cham. & Schltrld. | Wilhelmsia Rchb. |
|---------------------|-----------------|--------------------------|-----------------|
| Habit               | perennial herbs | shrubs, subshrubs and vines | perennial herbs |
| Leaf succulence, size (mm, length × width), and margins | not succulent, 7-12 × 2-12, entire | succulent, 4-46 × 0.5-20, often crenulate | not succulent, 5-15 × 2-8, serrulate or toothed at least along the distal half of the blade |
| Inflorescence       | solitary flowers | few-flowered or solitary flowers | dichasia/monochasia or panicule-like |
| Petals (number)     | absent | mostly 5 | absent |
| Sepals length (mm) and colour | 1.5-3.5, green | 3.5-7, green | 2.0-12.0, often purple |
| Styles (mm)         | 0.3-0.5 | 1-2 | up to 11 |
| Capsule size (mm, length × width), colour, and dehiscence | 2.3-3.5 × 1-2, pale-green, opening by 6 valves | 5-12.0 × 5-10, green to yellowish, opening by 3 valves | 1.5-12 × 0.5-6, green (sometimes with apex purple), opening by 4-11 valves |
| Seed diameter (mm)  | 0.5-0.7 | 2.0-4.0 | 0.6-1.8 |

((0.8)1-1.3 mm vs. 0.5-0.7 mm in *S. obtusa*), capsule shape (ovoid-pyrfiform vs. globose in *S. obtusa*).

*Stellaria pallida* is an annual species (*S. obtusa* is perennial), with stems with 1 line of hairs for each node (vs. glabrous (rarely hairy) in *S. obtusa*), narrower leaves at average (0.9-7 vs. 2-12), 3- to many-flowered inflorescences (vs. flowers solitary in *S. obtusa*), and an ovoid capsule (vs. globose in *S. obtusa*).

*Stellaria irrigua* has ± elliptic or lanceolate leaves, 1-10 × 1-3 mm (vs. ovate, 7-12 × 2-12 mm in *S. obtusa*), 3- to many-flowered inflorescences (vs. flowers solitary in *S. obtusa*), with bracts (vs. bractless), sepals with 3 prominent veins (vs. obscure veins in *S. obtusa*), and conic capsule (vs. globose).

### Table 1: Morphological comparison between *Engellaria* Iamonico and the related genera

| Characteristics | Engellaria Iamonico | Honckenyia Ehrh. | Schiedea Cham. & Schltrld. | Wilhelmsia Rchb. |
|-----------------|---------------------|-----------------|--------------------------|-----------------|
| Habit           | perennial herbs     | shrubs, subshrubs and vines | perennial herbs |
| Leaf succulence | not succulent       | succulent        | not succulent            |
| Petals (number) | absent              | mostly 5        | absent                   |
| Sepals length   | 1.5-3.5             | 3.5-7           | 2.0-12.0, often purple   |
| Styles (mm)     | 0.3-0.5             | 1-2             | up to 11                |
| Capsule size    | 2-3.5 × 1-2         | 5-12.0 × 5-10   | 1.5-12 × 0.5-6,         |
| Seed diameter   | 0.5-0.7             | 2.0-4.0         | 0.6-1.8                 |

Distribution: see the description of *Engellaria obtusa*. 

Etymology: my first idea was to dedicate the new genus to George Engelmann (1809-1884), an American physician and botanist who first described *Stellaria obtusa*, the single member of *Engellaria*. However, the name *Engelmannia* (derived from the surname Engelmann) has been published four times (*Engelmannia* A. Gray ex Nutt. (in 1840), *Engelmannia* Klotzsch (in 1841), *Engelmannia* Torr. & A. Gray (in 1842), *Engelmannia* Pfeiff. (in 1845)) and
my proposal would be illegitimate (later homonym according to the Art. 53.1 of the ICN, see Turland et al., 2018; note that also the Klotzsch’s, Torrey & Gray’s and Pfeiffer are homonyms and therefore illegitimate). So, with the aim to maintain “Engelmann” in the generic epithet, I created a name which results from a merge of “Engelmann” (Engel-) and “Stellaria” (-laria).

Proposed vernacular name: Engelmann’s starwort.

Species richness: a monotypic genus comprising the species Engellaria obtusa (Engelm.) Iamonico.

Table 2: Morphological comparison between Engellaria obtusa (Engelm.) Iamonico, and the apetalous members of Stellaria L. Concerning S. media (L.) Vill. the description refers to the apetalous forms.

|                | Engellaria obtusa (Engelm.) Iamonico | Stellaria crispa Cham. & Schltdl. | Stellaria dicranoides (Cham. & Schltdl.) Fenzl | Stellaria irrigua Bunge | Stellaria media (L.) Vill. | Stellaria pallida (Dumort.) Crép. |
|----------------|--------------------------------------|-----------------------------------|-----------------------------------------------|-------------------------|---------------------------|----------------------------------|
| Habit          | perennial, creeping                   | perennial, forming mats           | perennial, forming cushions                   | perennial, erect or forming clumps | annual/biennial, prostrate to ascending pubescent all around or with 1-2 lines of trichomes | annual, prostrate                 |
| Stem           | glabrous (rarely hairy)              | glabrous                          | glabrous                                       | glabrous                | one line of hairs below each node |                                  |
| Leaf shape and size (length × width, mm) | ovate, 7.0-12.0 × 2.0-12.0           | broadly elliptic to ovate, 4.0-25.0 × 2.0-15.0 | oblongate to obovate, 3.0-5.0 × 1.0-1.5         | elliptic or lanceolate, 1.0-10.0 × 1.0-3.0 | ovate to broadly elliptic, 10.0-20.0 × 5.0-10.0 | ovate to elliptic, 3.0-15.0 × 1.0-7.0 |
| Inflorescence  | flowers solitary                      | flowers solitary                   | inflorescence few-flowered or flowers solitary | inflorescence usually few-flowered | inflorescence 5- to many-flowered | inflorescence 3- to many-flowered |
| Sepal          | obtuse, glabrous, with obscure veins  | acute to acuminate, glabrous, with 3 prominent veins | obtuse, glabrous, with 3 prominent veins      | obtuse, glabrous, with obscure veins | acute, pubescent, with obscure veins |                                  |
| Styles (mm)    | <0.5                                 | ~ 1.0                             | ~ 1.0                                          | ~ 0.25                  | 0.5-1.0                    | 0.2-0.5                          |
| Capsules       | globose (length ~ width)              | ovoid (length >1.5 times width)    | ovoid (length ~ 1.5 times width)               | conic (length ~ 1.5 times width) | ovoid-pyriform (length ~ 1.5 times width) | ovoid (length ~ 1.5 times width) |
| Seeds (mm)     | 0.5-0.7                              | 0.7-1.0                           | 1.0-1.1                                        | 0.5-0.7                 | (0.8)1.0-1.3                | 0.5-0.9                          |

Chorology: see Engellaria obtusa.

Inclusion of Engellaria in the diagnostic key of Caryophyllaceae sensu Rabeler and Hartman (2005): on the basis of the generic diagnosis above and the description of Engellaria obtusa (below), I here propose a subkey for the apetalous members belonging to the American Caryophyllaceae genera characterized by having leaves without stipules, sepals free, and fruits a capsule (steps 25-29 of the diagnostic key from Rabeler and Hartman (2005)).
1a. Capsule cylindric with 8 or 10 valves; sepals usually 4-5 ......................................................... 2
1b. Capsule ovoid or globose with up to usually 6 valves; sepals usually 4-6 ........................................... 3
2a. Capsule valves usually 8; styles usually 4 ................................................................. Moenchia Ehrh.
2b. Capsule valves usually 10; styles usually 5 ................................................................. 6
3a. Sepals 4(-5) .......................................................................................... 4
3b. Sepals 5(-6) .......................................................................................... 5
4a. Capsule valves 4-5; styles 4-5 ............................................................. Sagina L.
4b. Capsule valves 6; styles 3(-4) ........... Engellaria Iamonico
5a. Capsule valves or teeth 2 times the number of styles .. 6
5b. Capsule valves or teeth equal in number of styles ........................................................................... 7
6a. Styles 3(5); capsule valves (3, 4) 6 (8, 10); seeds usually yellowish to brown, smooth or tuberculate when shiny .................................................................................................................................... Stellaria L.
6b. Styles 3; capsule valves 6; seeds dark brown or black, always shiny, smooth or obscurely tuberculate ........ ......................................................................................................................................... Arenaria L.
7a. Stamens 5 ................................................................. Mononeuria Rchb.
7b. Stamens 10 ................................................................. Sabulina Rchb.

Engellaria obtusa (Engelm.) Iamonico, comb. nov. Fig. 1.

≡ Stellaria obtusa Engelm., Bot. Gaz. 7(1): 5. 1882. TYPE: UNITED STATES OF AMERICA. Colorado, Anthracite Ck (Creek), Colorado, 1881, T. S. Brandegee s.n. (lectotype designated here: UC120055! (image available at UC, 2021a); isolateotypes: GH00037991!, GH00037990! (image available at HUH, 2021), NY00353081! (image available at NYBG, 2021a), YU001676! (image available at YU, 2021)).
≡ Alsine obtusa (Engelm.) Howell, Fl. N. W. Amer. 1: 83. 1897, nom. inval. (isonym, Art. 6.3 Note 2 of the ICN, Turball et al., 2018).

Perennial herbs, rhizomatous (rhizome usually white), creeping (hemicryptophytes); stems prostrate, often matted (not forming cushions), branched, (3-)5-20(-25) cm long, with internodes as long as or longer than the leaves, usually glabrous; leaves sessile or shortly petiolate with blades ovate (7-9(-12) × 2-12 mm (sizes are given as length × width through the text)), glabrous (ciliate near the margin), shiny, margins entire and ciliate in the proximal part, base rounded or cuneate, apex acute; flowers solitary, axillary, without bracts, 1.5-2 mm in diameter; petals 0.6-0.7 mm long, ciliate, white, yellowish to brown, smooth or obscurely tuberculate when shiny; ovary 1-loculed at maturity; style usually 3, 0.3-0.5 mm long; ovary 1-loculed at maturity (rarely 3-loculed in young individuals); ovules numerous; capsules pale-green, globose, 2-3.5 × 1-2 mm, about 2 times the length of the sepals, opening by 6 valves; seeds grayish-black or dark-brown, elliptic, 0.5-0.7 mm in diameter, finely reticulate.
Iamonico: *Engellaria* gen. nov. (Caryophyllaceae)

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Vernacular names: blunt-sepaled starwort (E-Flora BC, 2020), Engelmann’s starwort (here proposed), Rocky Mountain starwort (Morton, 2005; Hartman and Rabeler, 2012), Rocky Mountain chickweed (Hassler, 2020).

Habitat: moist areas in woods, shaded edges of creeks, slopes; altitude: 300-3400 m a.s.l.

Chorology (Fig. 2): endemic to western North America in Canada (British Columbia, Alberta), and USA (California, Colorado, Idaho, Montana, Oregon, Utah, Washington, Wyoming).

Chromosome number: 2n=26, 52, c. 65, c. 78 (Hartman, 1971; Morton and Rabeler, 1989).

Conservation status: I prefer not carrying out the IUCN assessment of *Engellaria obtusa*, since I think that further distribution data are needed. As a consequence, this species is to be considered as DD (Data Deficient) according to the IUCN criteria (IUCN, 2016).

Typification of *Stellaria obtusa*: Engelmann (1882: 5) validly published the name *Stellaria obtusa* with a diagnosis (in English), the provenance (“Western Colorado on the tributaries of Gunnison River, alt. 9000 to 10,000 feet”), the habitat (“in damp grounds”) and the collector (“T. S. Brandegee”).

I found pertinent specimens at GH (barcodes 00037990, and 00037991), NY (barcode 00353081), UC (barcode 120055), and YU (barcode 001076), but no sheets...
at MO (where Engelmann would have written the description of *S. obtusa*) were traced. Therefore, this strengthens the case for selecting a lectotype from material at another herbarium. All five specimens are part of T. S. Brandegee’s collection and were collected by him in 1881 in “Anthracite Ck, Colorado” (as reported on the original labels). Anthracite Creek (= Ck) is a river in Gunnison County. The data on the labels match Engelmann’s protologue of *Stellaria obtusa*, the plants were collected before 1882 (year of collection 1881) and the morphology matches Engelmann’s diagnosis. The GH, NY, UC, and YU specimens are part of the original material used by Engelmann (1882: 5) to propose the new species. Since the UC specimen appears to be the best preserved, I here designated it as the lectotype of the name *Stellaria obtusa*, whereas the GH, NY, and YU specimens are isolecotypes (Arts. 9.3 and 9.4 of the ICN, Turland et al., 2018). The abovementioned specimens bear recently printed labels. The UC specimen mentions “NEOTYPE of: *Stellaria obtusa* Engelm. Bot. Gaz. (Crawfordsville) 7: 5. 1882. = *Stellaria obtusa* Engelm. Det.: Richard K. Rabeler 1986 Michigan State University Herbarium (MSC)”. The GH and NY ones bear “ISONEOTYPE of: *Stellaria obtusa* Engelm. Bot. Gaz. (Crawfordsville) 7: 5. 1882. = *Stellaria obtusa* Engelm. Det.: Richard K. Rabeler 1986 Michigan State University Herbarium (MSC)”, and the YU bears “ISOTYPE A DUPLICATE OF THE HOLOTYPE *Stellaria obtusa* Engelm. Bot. Gaz. 7: 5. 1882”. No published paper, in which a neotypification by R. K. Rabeler was proposed, was traced and, as a consequence, the statements occurring on the printed labels of GH, NY, and UC specimens cannot be considered

Figure 2: Distribution map of *Engellaria obtusa* (Engelm.) Iamonico.
as an effective typification. Moreover, since original material exists, a lectotypification is required (Arts. 9.3 and 9.4 of the ICN, see Turland et al., 2018), whereas a neotypification is appropriate “if no original material exists” (see Art. 9.8 of the ICN). The “isotype” indication on the YU specimens cannot be retained neither, since the holotype was not cited by Engelmann (1882: 5) (see Art. 9.1 of the ICN, Turland et al., 2018, and the considerations given by McNeill, 2014).

Note on the type of Alsine viridula: Alsine viridula was validly published by Piper (1913: 207) through a detailed diagnosis followed by data regarding the provenance, habitat, collector, date of collection, and herbarium (“Type in the U.S. National Herbarium, no. 249940, collected on ridges south from Wiessner Peak, Idhaio, July 28, 1895, by J. B. Leiberg (no. 1396). Growing in springy places in canyons, altitude 1700 meters. Also collected along rivulets in woods, altitude 1400 meters, in the Blue Mountains, Columbia County, Washington, July 1896, C. V. Piper, no. 2328”).

I located eight relevant specimens at CAS (barcode 0000308), F (barcode 281494), GH (barcode 00037575), NY (barcode 342333), OSC (barcode 04665), RM (barcode 0002118), UC (barcode 154382), and US (barcode 00103237). All these specimens bear the following original label: “PLANTS OF NORTHERN IDAHO. REGION OF THE COEUR D’ALENE MOUNTAINS. Spring places in canyons Ridges south from Wiessner’s Peak alt. 1700 m No. 1396 John B. Leiberg collector, July 28, 1895”. The information on this label matches information reported by Piper (1913: 207) in the protologue. Moreover, the morphology of the exsiccata also matches Piper’s diagnosis. According to the considerations by McNeill (2014); Piper’s (1913) statement “Type in the U.S. National Herbarium, no. 249940” clearly indicates the author had the intention to identify the US specimen as the holotype. As a consequence, all other seven specimens found are isotypes (Arts. 9.1 and 9.5 of the ICN, Turland et al., 2018).

According to the current concept of Stellaria (Morton, 2005; Sharples and Tripp, 2019), all the specimens of original material found are identifiable as Engellaria obtusa and, as a consequence, Alsine viridula can be synonymized with it.

Additional examined material: names of plants are given in alphabetical order. Specimens, under each species, are given in alphabetical order of the names of the countries and chronological order of the dates of collection.

Engellaria obtusa: UNITED STATES OF AMERICA. Colorado, Rio Blanco Co., Flat-Tops Wilderness, Marvine Creek, trail between trailhead and Slide Lake, locally abundant along the edge of trails, in aspen forest with abundant tall herbs, 11.VI.1988, W. A. Webere 17890 (NY03328683). Idaho, Caribou Co., Grays Range, Gravel Creek Campground, 22 airline miles, north-northeast of Soda Springs, 6700 ft, 19.VII.1971, N. H. Holmgren 5518 (NY00482982). Cassia Co., Mt. Independence, vicinity of Independence Lake, Picea engelmannii, Abies lasiocarpa, Pinus flexilis forest, 09.VIII.2008, J. F. Smith 7732 (NY01264791). Franklin Co., moist soil under willows in headwaters of Logan River, 2 miles north of Utah state line, 8000 feet, 15.VII.1958, L. C. Anderson 1348 (NY00482990); Franklin Co., Wasatch Range, Bear River Range, along Beaver Creek on the south side of the Egan Basin Road, 11.7 km (7.3 miles) north of U.S. Highway 89, among willows in moist ground, 8100 ft, 21.VII.2010, N. H. Holmgren 16267 (NY01207811). Washington, Lake Cushman, deep woods, in clayey ground, VIII.1895, C. V. Piper 2238 (GH00283957, syntype of the name Stellaria washingtoniana).

Honckenya peploides: CANADA. Baffin Island, 1978, P. Wood s.n. (BM001050332). UNITED KINGDOM. England, Mablethorpe, 12.VI.1893, F. A. Lees s.n. (BM013414807). Humberston, Marine sand, 02.VI.1905, E. A. Woodruffe-Peacock s.n. (BM013414808). UNITED STATES OF AMERICA. Massachusetts Plymouth, Plymouth, 24.VIII.1935, C. Darling s.n. (GH00698566). New Hampshire Rye, Rye, 10.III.1959, S. K. Harris 21019 (NEBC00698555). New York, Suffolk Co., 28.VIII.1920, W. C. Ferguson s.n. (NY3266682).

Stellaria crispa: CANADA. British Columbia, Gordon Head, Victoria, woods, 6.VIII.1921, F. W. Hunnewell 7705 (GH01755808). Hoheae Island Kyuquot, sea level, 29.VI.1958, J. W. Eastham 129 (GH01755809). UNITED STATES OF AMERICA. Idaho, about Lake Waha, Nez Perces
Co., 2000-3500 feet, 25.VI.1896, A. A. and E. G. Heller 3367 (P05437041); 12 miles west of Salmon, under alders and birches along small creek entering on south side of Salmon River, 12.VII.1945, J. H. Christ and W. W. Ward 14685 (NY03317726); South Fork of the Boise River, road from Featherville, W of Mann Creek, seep, slope along road, 24.VI.2009, J. F. Smith 8131 (NY03317710). Washington, Mount Adams, 15.VIII.1882, T. Howell s.n. (P05437044).

Stellaria dicranoides: UNITED STATES OF AMERICA. Alaska, Cape Lisburne. W. Eskimoland, 1849, B. C. See- man s.n. (K000723558); Healy, 1922, J. P. Anderson 1626 (NY03317779); Mt. Distin, 04.VI.1938, J. P. Anderson s.n. (GH01755881); Mt. Austin, 04.VI.1938, J. P. Anderson, A. R. Hodgdon 8106 (GH01755882); Mt. Copper, NW slope to summit of Mt. Eielson, 24.VI.2009, J. F. Smith 8131 (NY03317710). Washington, Mount Adams, 15.VIII.1882, T. Howell s.n. (P05437044).

Stellaria media: CAMEROON. Northwest Region Bui Elak Summit of Mount Oku, 10.VI.1996, S. Cable 3083 (K000337575). FRANCE. 78 Yvelines, Poigny-la-Forê, env. de Rambouillet, Poigny, 13.X.1055, P. Jovet s.n. (P02599326). GERMANY. Bayern, Lkr. Garmisch-Partenkirchen, S Bad Kohlgrub, TK 8332/3, Bergwiesen, Fichtenwaldrand, 1484 m, 31.VII.2001, R. Willing and E. Willing 14599D (B-10-0070647). ITALY. Lazio, Rome Province, Appia Antica Regional Park, “Acquedotti” Park, walkways, 03.V.2020, D. Iamonico s.n. (HFLA). UNITED KINGDOM. Kew Gardens, Birdcage Walk, Kew Green, in grass at the base of a lime tree (zone 118), 23.VI.2008, T. A. Cope RBG115 (K000914072). UNITED STATES OF AMERICA. Wisconsin, Grant Co., along railroad, at Walnut Street, 28.IV.2012, M. Nee 59060 (NY03328371).

Stellaria pallida: ITALY. Lazio, Rome Province, Appia Antica Regional Park, “Acquedotti” Park, walkways, 03.V.2020, D. Iamonico s.n. (HFLA). MALAWI. Southern Region, Zomba District, Zomba Plateau, near Ku Chave Inn, 1530 m, weed on Hotel rock garden, 14.III.1970, R. K. Brummit 9178 (P05138272). POLAND. Silesia, Breslau, an der Chaussee nach Hundsfeld, 14.VI.1993, C. G. Baenitz s.n. (US03610250). UNITED KINGDOM. Kew Gardens, Birdcage Walk, Kew Green, in grass at the base of a lime tree (zone 118), 10.IV.2013, T. A. Cope RBG564 (K000914610). UNITED STATES OF AMERICA. Florida, Nassau Co., along base of walls of Fort Clinch, Fort Clinch State Park, 29.III.1982, D. S. and H. B. Correll 53453 (NY03328715). Ohio, Wyandot Co., 4.5 km NE of Upper Sandusky, Indian Mill, small park opposite the Mill, flood plain of Sandusky River, 06.V.2012, M. Nee 59115 (NY03328714).

Stellaria irrigua (= S. umbellata): RUSSIA. Aksu et Sarchan, 1841, G. S. Karelin and I. P. Kirilov 1305 (K000723680); In muscosis rupium summarum alpium Alatau ad fontes fluviorum Aksu et Sarchan, 1842, G. S. Karelin and I. P. Kirilov 1305 (K001327006). UNITED STATES OF AMERICA. California, 7 miles north of ft Bidwell, Warner mts., 8.VII.1955, R. J. Wetherby 1618 (NY00453086). Montana, Glacier National Park, open rocky slope, along the trail from Many Glacier Hotel to Piegan Pass, 11.VIII.1919, P. C. Standley 17485 (US03607539). Utah, Wasatch Co. Uinta Mountains, 18.VIII.1998, N. H. Holmgren 13411 (NY01192094). Wyoming, Gunnison Co., Northern Gunnison Basin, West Elk Fork Creek, ca 12 air mi ENE of Crawford, 28.V.1998, K. J. Taylor 7464 (GH01845069).

Wilhelmsia physodes: NORTH AMERICA. 1849 (HOOKERIANUM HERBARIUM 1867), s. coll. s.n. (K000742026). CANADA. Edmund’s Island at Rampant House on the Yukon - Alaska border, scattered in Aspen woods, 06.VII.1951, C. C. Loan 551 (GH01624268); Yukon, Ogilvie Mts., river flats along Dempster Rd. Mile 57, 2500-4200 ft, 09.VII.1966, R.T. Polsid 162 (GH01624269); Nisling River Valley, 2700 ft, sand and gravel river bar, 23.VII.1980, W. J. Cody and J. H. Ginn 28277 (NY03329338). RUSSIA. Magadan, regio Tschukotschi, alluvium, 05.VIII.1966, V. Petrovsky 5625 (P06673352). UNITED STATES OF AMERICA. Alaska, railroad embankment, Cantwell, 18.VIII.1939, A. Nelson and R. A. Nelson 4207 (NY03329354).

Author contributions
DI conceived and designed the study, reviewed the collections, wrote the manuscript, edited the revised version and approved the final manuscript.
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