

## A REVISION OF *FACCHINIA* (*MINUARTIA* S.L., CARYOPHYLLACEAE)

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*Facchinia* Rchb. (Alsinoideae–Caryophyllaceae), earlier found not to be part of *Minuartia* s.str., is here revised. The genus contains seven species, one of which has two subspecies. Seven new combinations are made: *Facchinia cerastiifolia* (Ramond ex DC.) Dillenb. & Kadereit, *F. cherlerioides* (Sieber) Dillenb. & Kadereit, *F. cherlerioides* subsp. *aretioides* (Port. ex J.Gay) Dillenb. & Kadereit, *F. grignensis* (Rchb.) Dillenb. & Kadereit, *F. herniarioides* (Rion) Dillenb. & Kadereit, *F. rupestris* (Scop.) Dillenb. & Kadereit, and *F. valentina* (Pau) Dillenb. & Kadereit. Keys to *Minuartia* s.str., the Old World segregate genera of *Minuartia* s.l., and to the species and subspecies of *Facchinia* are provided. All taxa are described and mapped, and some are illustrated.

*Keywords.* Caryophyllaceae, *Facchinia*, *Minuartia*, taxonomic revision.

### INTRODUCTION

A recent molecular phylogenetic analysis of *Minuartia* L. (Dillenberger & Kadereit, 2014) shows that the genus in the circumscription of, e.g., Mattfeld (1922) and McNeill (1962) is highly polyphyletic, as had been shown earlier by Fior *et al.* (2006), Harbaugh *et al.* (2010) and Greenberg & Donoghue (2011). In *Minuartia*, Dillenberger & Kadereit (2014) identified 10 clades none of which were sister to each other. Of these 10 clades, *Minuartia* sects. *Minuartia* and *Plurinerviae* McNeill were retained as *Minuartia* s.str., and all others were accommodated in other genera (Dillenberger & Kadereit, 2014), one of which is *Facchinia* Rchb. *Facchinia* was first described by Reichenbach (1841a) with the single species *F. lanceolata* (All.) Rchb. (Reichenbach, 1841b), formerly treated as a member of *Alsine* L. (e.g. Mertens & Koch, 1826) and later as a member of *Minuartia* (e.g. Mattfeld, 1921). The current name for *Facchinia lanceolata* is *Minuartia rupestris* (Scop.) Schinz & Thell. subsp. *clementei* (Huter) G.Halliday ex Greuter & Burdet. *Facchinia lanceolata* is part of a clade of seven species which is sister to *Sagina* L. and *Colobanthus* Bartl. (Dillenberger & Kadereit, 2014). In order to accommodate the findings of Dillenberger & Kadereit (2014) taxonomically, we here present a taxonomic revision of *Facchinia*.

## MATERIAL AND METHODS

We examined 500 herbarium specimens and photographs of specimens of *Facchinia* from BOZ, F, G/G-DC, GRM, LJU, M/MSB, MJG, PR, STR, TO, VAL, W, WU and Z/ZT. Additional photographs were available online from HAL and JE (accessible via Virtual Herbaria: <http://herbarium.univie.ac.at/database/search.php>), P (accessible via MNHN: <http://science.mnhn.fr/institution/mnhn/search>), and MA (accessible via GBIF: <http://www.gbif.es/>). Specimens that are photographs are cited as “photograph specimen” and specimens of real plants that were seen only as photographs are cited as “[photo!]”. Specimens were examined with a Zeiss Stemi SV 11 binocular microscope at 66× magnification.

## TAXONOMIC TREATMENT

Since plants of *Facchinia* may initially be identified as *Minuartia* s.l. based on the combination of three styles and three capsule teeth, we here provide a key to *Minuartia* s.str. and Old World segregates of *Minuartia* s.l.

- 1a. Cotyledons accumbent (radicle applied to margins of both cotyledons); sepals acute; capsule teeth 3 or 6, when 3 flowers usually pink \_\_\_\_\_ 2
- 1b. Cotyledons incumbent (radicle lying along back of one cotyledon); sepals acute or obtuse; capsule teeth 3; flowers white, when pink sepals obtuse \_\_\_\_\_ 3
- 2a. Flowers subperigynous, petals and stamens arising on or at top of a very short calyx tube; inner stamens frequently adnate to petals; seeds not pyriform;  $x = 9$  \_\_\_\_\_ **Rhodalsine** J.Gay
- 2b. Petals and stamens arising from a hypogynous disc; petals and stamens always free at base; seeds pyriform;  $x = 11$  \_\_\_\_\_ **Eremogone** Fenzl
- 3a. Leaves linear-lanceolate, oblanceolate, lanceolate or oblong-elliptical; flowers never with episepalous staminodes \_\_\_\_\_ 4
- 3b. Leaves linear-setaceous to subulate, or flowers with episepalous staminodes \_\_\_\_\_ 8
- 4a. Sepals acute, ovate to linear-lanceolate \_\_\_\_\_ 5
- 4b. Sepals obtuse, oblong \_\_\_\_\_ 7
- 5a. Sepals 3- to 5-veined, when 5-veined, marginal nerves not conspicuous beyond the middle of sepal length;  $2n = 36$  \_\_\_\_\_ **Facchinia** Rchb.
- 5b. Sepals many-veined ( $\geq 5$ ), when 5-veined, marginal nerves conspicuous beyond middle of sepal length;  $2n = 32$  \_\_\_\_\_ 6
- 6a. Petals longer than sepals, obovate \_\_\_\_\_ **Mcneillia** Dillenb. & Kadereit
- 6b. Petals shorter than sepals, ovate \_\_\_\_\_ **Minuartiella** Dillenb. & Kadereit
- 7a. Seeds fimbriate-cristate; plants with long, acute, multicellular hairs;  $x = 11, 12, 13, 21, 23$  \_\_\_\_\_ **Pseudocherleria** Dillenb. & Kadereit

- 7b. Seeds smooth or subtly sulcate; plants glabrous or with unicellular hairs;  $x = 13$  \_\_\_\_\_ **Cherleria** L.
- 8a. Sepals obtuse, oblong;  $x = 13$  \_\_\_\_\_ **Cherleria** L.
- 8b. Sepals acute, ovate to linear-lanceolate \_\_\_\_\_ 9
- 9a. Sepals with 5–9 veins and petals always present; when sepals with 1–3 veins, calyx strongly hardened at base;  $x = (13, 14) 15$  \_\_\_\_\_ **Minuartia** L. s.str.
- 9b. Sepals usually with 1–3 veins, when veins more than 3, petals absent or sepals obscurely veined; calyx not hardened at base \_\_\_\_\_ **Sabulina** Rchb.

**Facchinia** Rchb., Deut. Bot. Herb.-Buch.: 204; [Syn. Red.] 63. 1841. – *Alsine* sect. *Facchinia* (Rchb.) Griseb., Spicil. Fl. Rumel. 1: 202. 1843. – Type: *F. lanceolata* (All.) Rchb. (designated by J.J. Swart, ING card 13200, 1 Apr. 1961).

*Schmidtia* Sieber, Hesperus 1813: 67. 1813, non Steud. ex J.A.Schmidt 1852 (nom. cons.), nec Tratt. 1816, nec Moench 1802. – Type: *S. cherlerioides* Sieber [“cherlerioides”].

*Siebera* Hoppe, Flora 2: 24. 1819, non J.Gay 1827 (nom. cons.), nec Rchb. 1828, nec *Sieberia* Spreng. 1817. – *Alsine* sect. *Siebera* (Hoppe) Pax, Nat. Pflanzenfam. [Engler & Prantl] 3(1b): 83. 1889. – *Minuartia* sect. *Siebera* (Hoppe) Graebn. in Asch. & Graebn., Syn. Mitteleur. Fl. 5(1): 752. 1918. – Type: *S. cherlerioides* Hoppe.

*Someraueria* Hoppe, Flora 2: 26. 1819, inval. Art. 36.1b. – *Cherleria* a. *Someraueria* (Hoppe) Rchb., Consp. Regn. Veg. [H.G.L.Reichenbach]: 206. 1828. – *Alsine* d. *Someraueria* (Hoppe) Endl., Enchir. Bot. (Endlicher): 505. 1841. – *Minuartia* sect. *Someraueria* (Hoppe) Mattf., Bot. Jahrb. Syst. 57(Beibl. 126): 31. 1921. – Type: *S. quadrifaria* Hoppe (designated by Löve & Löve in Preslia 46: 127. 1974; indicated as “*S. aretioides* Hoppe”, that is *S. quadrifaria* Hoppe mixed up with its synonym *Arenaria aretioides* Sommerauer).

*Dufourea* Gren., Actes Soc. Linn. Bordeaux 9: 25. 1827, non Ach. 1809, nec Bory ex Willd. 1810, nec Kunth 1818 [1819]. – *Alsine* e. *Dufourea* (Gren.) Endl., Enchir. Bot. (Endlicher): 505. 1841. – Type: *D. cerastiifolia* (DC.) Gren. (designated here).

*Alsine* 4. *Aretioideae* Fenzl, Gen. Pl. [Endlicher] 965. 1840. – *Alsine* sect. *Aretioideae* (Fenzl) Fenzl, Fl. Ross. (Ledeb.) 1: 350. 1842. – Type: *A. aretioides* Sommerauer.

*Alsine* 5. *Lanceolatae* Fenzl, Gen. Pl. [Endlicher] 965. 1840. – *Alsine* sect. *Lanceolatae* (Fenzl) Fenzl, Fl. Ross. (Ledeb.) 1: 350. 1842. – *Minuartia* subg. *Minuartia* sect. *Lanceolatae* (Fenzl) Graebn. in Asch. & Graebn., Syn. Mitteleur. Fl. 5(1): 756. 1918 (excl. ser. *Graminifoliae* Mattf. and ser. *Dianthifoliae* Mattf.). – Type: *A. lanceolata* (All.) Mert. & W.D.J.Koch.

*Minuartia* sect. *Lanceolatae* ser. *Cerastiifoliae* Mattf., Repert. Spec. Nov. Regni Veg. Beih. 15: 136. 1922. – Type: *M. cerastiifolia* (Ramond ex DC.) Graebn.

*Minuartia* sect. *Lanceolatae* ser. *Grigneensis* Mattf., Repert. Spec. Nov. Regni Veg. Beih. 15: 130. 1922. – Type: *M. grigneensis* (Thomas) Mattf. [“*grigneensis* (Reichb.) Mattf.” (designated by McNeill in Notes Roy. Bot. Gard. Edinburgh 24: 144. 1962)].

Perennial herbs, woody below; caespitose to erect, axes usually glandular-pubescent, rarely glabrous; leaves entire, linear to lanceolate or oblong-elliptical (Fig. 1), opposite, sessile and connate, with 3–7 veins, often only the middle vein prominent, often ciliate and glandular-pubescent, rarely glabrous. Pedicels usually glandular-pubescent, rarely glabrous. Flowers actinomorphic, sepals 4 or 5, with 3–5(–7) veins, acute, often glandular-pubescent, rarely glabrous; petals 4 or 5 or rarely absent, lanceolate, white; stamens 8 or 10; styles 3 (rarely 4); capsules with 3 (rarely 4) valves; seeds reniform.  $2n = 36/72$  (Favarger, 1959, 1962; Çelebioğlu *et al.*, 1990).

*Distribution.* Alps, Pyrenees and mountains near Valencia (E Spain; Fig. 2).

*Habitat and ecology.* Mostly above 1300 m and on calcareous substrate. Flowering: July to August.

*Facchinia* can be distinguished from other members of *Minuartia* s.l. by the combination of acute sepals with 3–5(–7) veins and linear or lanceolate to oblong-elliptical leaves and a diploid chromosome number of  $2n = 36/72$ .

The only species of *Facchinia* known to Reichenbach (Reichenbach, 1841b), *F. lanceolata* (All.) Rchb., was selected as type of the genus. Older names for the genus are *Schmidtia* Sieber (1813), *Somerauera* Hoppe (1819), *Siebera* Hoppe (1819) and *Dufourea* Gren. (1827). Whereas *Dufourea* Gren. is a later homonym of *Dufourea* Ach. (1809, Teloschistaceae), *Somerauera* is a provisional name following Art. 36.1b of the Code (McNeill *et al.*, 2012) and therefore not validly published. *Siebera* Hoppe and *Schmidtia* Sieber are later homonyms of *Siebera* Spreng. (1817, Orchidaceae) and *Schmidtia* Moench (1802, Asteraceae), respectively.

#### Key to the species of *Facchinia*

- 1a. Sepals and (when present) petals 4; leaves convex in cross section; plants forming dense cushions,  $\leq 5$  cm high \_\_\_\_\_ 2
- 1b. Sepals and petals 5; leaves flat; plants laxly caespitose, procumbent with ascending axes or erect, often  $> 5$  cm \_\_\_\_\_ 3
- 2a. Leaves ciliate; plants of siliceous rocks (Valais, Aosta, Ticino and Adamello group) \_\_\_\_\_ **4. F. herniarioides**
- 2b. Leaves not ciliate; plants of calcareous rocks (northern and southern calcareous Alps) \_\_\_\_\_ **2. F. cherlerioides**
- 3a. Plants completely glabrous; leaves linear (Bergamo Alps) \_\_\_\_\_ **3. F. grignensis**
- 3b. Plants (glandular-)pubescent, at least above; leaves linear or (ovate-)lanceolate (Pyrenees, E Spain, Alps except Bergamo Alps) \_\_\_\_\_ 4
- 4a. Plants usually taller than 10 cm; leaves linear; on Buntsandstein (E Spain) \_\_\_\_\_ **7. F. valentina**
- 4b. Plants up to 10 cm; leaves (ovate-)lanceolate; mostly on calcareous rocks (Alps, Pyrenees) \_\_\_\_\_ 5

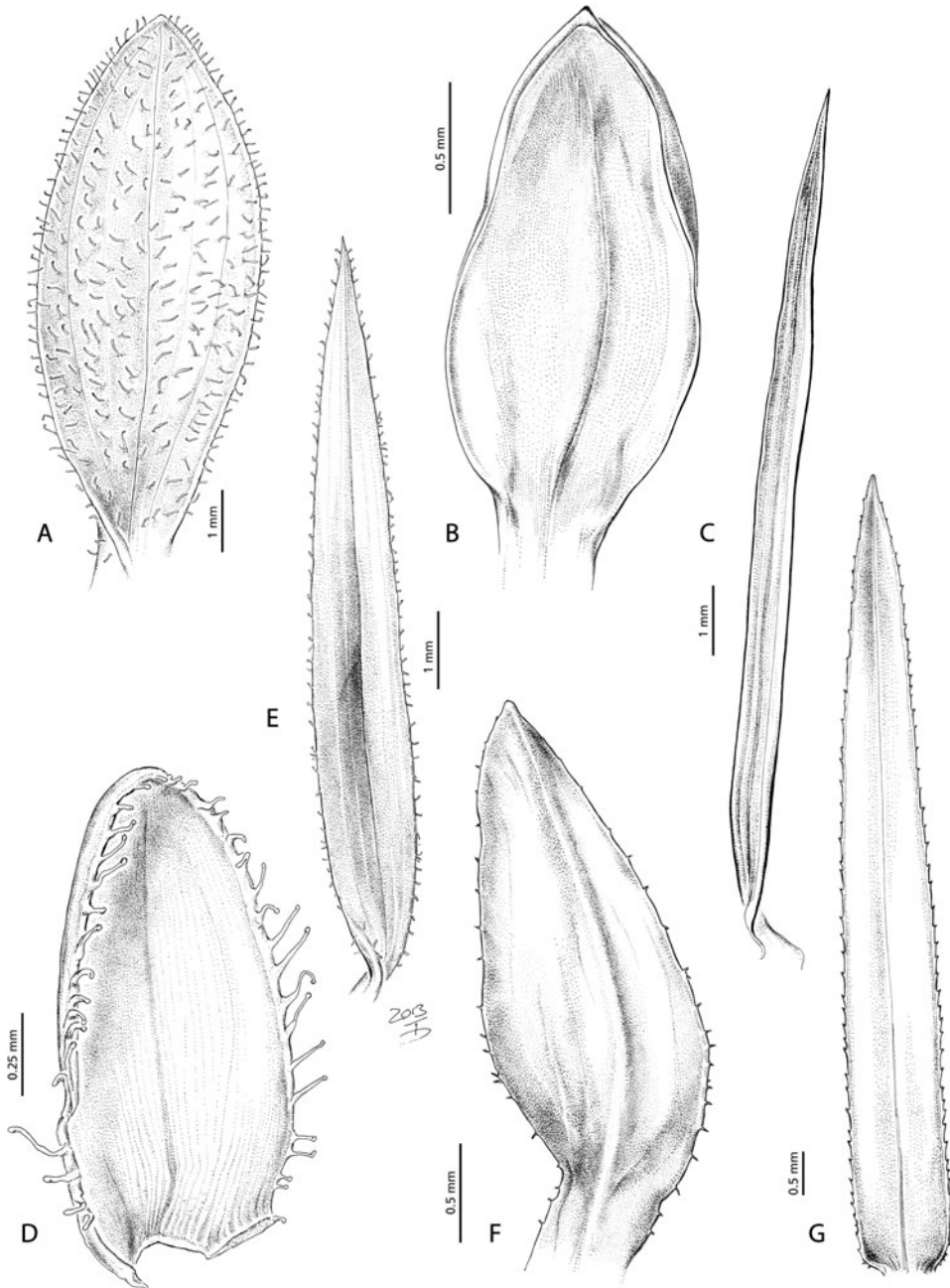


FIG. 1. Middle cauline leaves of A, *Facchinia cerastiifolia*; B, *F. cherlerioides*; C, *F. grignensis*; D, *F. herniarioides*; E, *F. lanceolata*; F, *F. rupestris*; G, *F. valentina*.

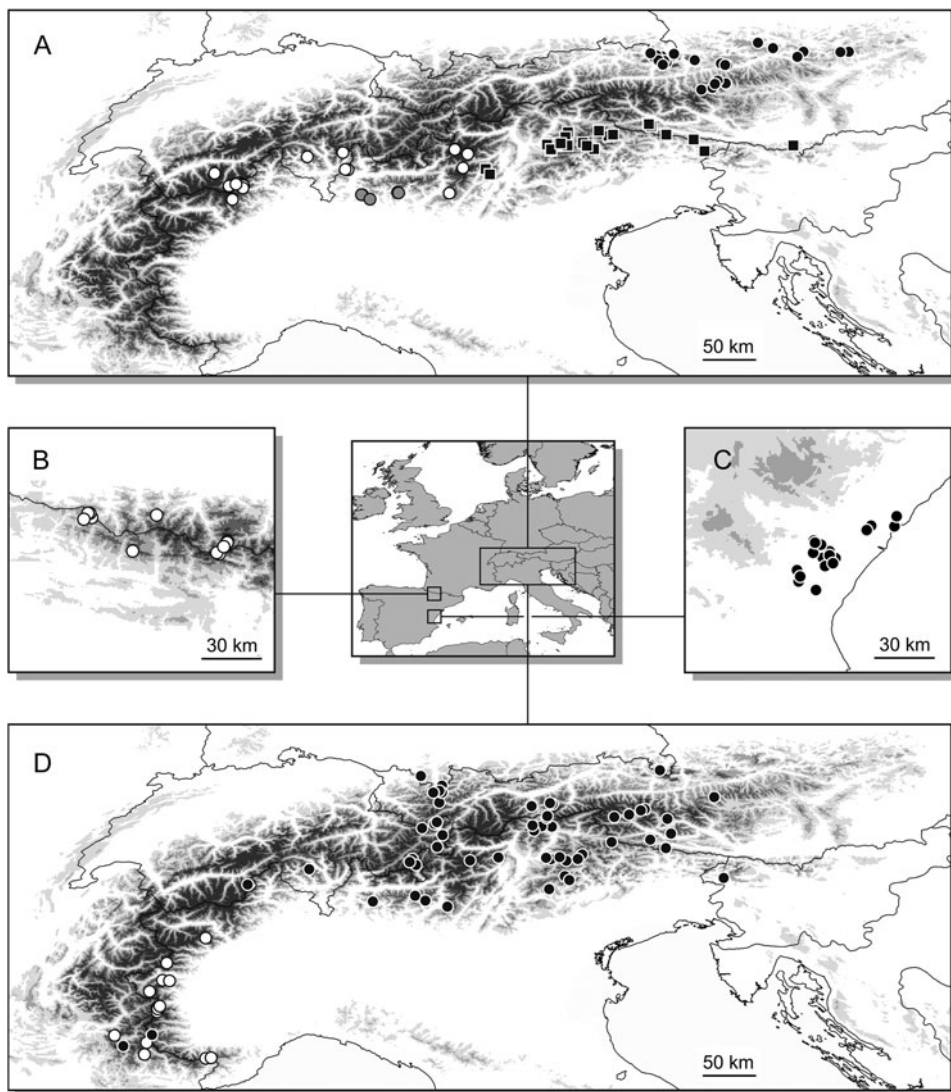


FIG. 2. Distribution of *Facchinia*. A: white = *F. herniarioides*; grey = *F. grignensis*; black = *F. cherlerioides*, circles = subsp. *aretioides*, squares = subsp. *cherlerioides*. B: *F. cerastiifolia*. C: *F. valentina*. D: white = *F. lanceolata*; black = *F. rupestris*.

- 5a. Axes and leaves densely pubescent; capsules c.1.5 times as long as sepals; leaves ovate-lanceolate (Pyrenees) \_\_\_\_\_ **1. *F. cerastiifolia***
- 5b. Axes and leaves sparsely pubescent; capsules equalling sepals; leaves lanceolate (Alps) \_\_\_\_\_ 6

- 6a. Plants 3.5–10 cm tall; leaves 5–12 mm long; pedicels 8–15 mm; flowers rarely solitary on stems, often two or more flowers per stem; on calcareous rocks (SW Alps) \_\_\_\_\_ **5. *F. lanceolata***
- 6b. Plants 1–3 cm tall; leaves 2–4.5 mm long; pedicels 1–5 mm; flowers usually solitary on stems, in SW Alps also in pairs; on calcareous or siliceous rocks (Central and SW Alps) \_\_\_\_\_ **6. *F. rupestris***

**1. *Facchinia cerastiifolia*** (Ramond ex DC.) Dillenb. & Kadereit, **comb. nov.** – *Arenaria cerastiifolia* Ramond ex DC., Fl. Franc. (DC. & Lamarck), ed. 3. 5(= 4.2): 783. 1805. – *Arenaria ramondii* Poir., Encycl. [J. Lamarck et al.] Suppl. 5: 3. 1817 [“Ramondi”]. – *Alsine cerastiifolia* (Ramond ex DC.) Fenzl, Vers. Darstell. Alsin.: Tab. ad 57. 1833. – *Dufourea cerastiifolia* (Ramond ex DC.) Gren. in Actes Soc. Linn. Bordeaux 9: 25. 1837. – *Alsine glandulosa* Dulac, Fl. Hautes-Pyrénées: 246. 1867, non Boiss. & A.Huet 1856, nec Mutel ex Nyman 1878. – *Minuartia cerastiifolia* (Ramond ex DC.) Graebn., Syn. Mitteleur. Fl. 5(1): 754. 1918. – *Somerauera cerastiifolia* (Ramond ex DC.) Á.Löve & D.Löve, Preslia 46: 127. 1974. – Type: France, Troumouse, s.d., *L.F.E. Ramond de Carbonnière* s.n. (lecto G-DC barcode G00213272 [photo!], designated here).

*Alsine cerastiifolia* var. *laxa* Rouy & Foucaud, Fl. France [Rouy & Foucaud] 3: 264. 1896. – Type: “*Arenaria cerastiifolia* Ram.”, Pic d’Anie, 8 viii 1848, *A. de Forestier* s.n. (lecto P barcode P04999108, three individuals at the left of upper row of middle group of plants [photo!; see Fig. 3], designated here).

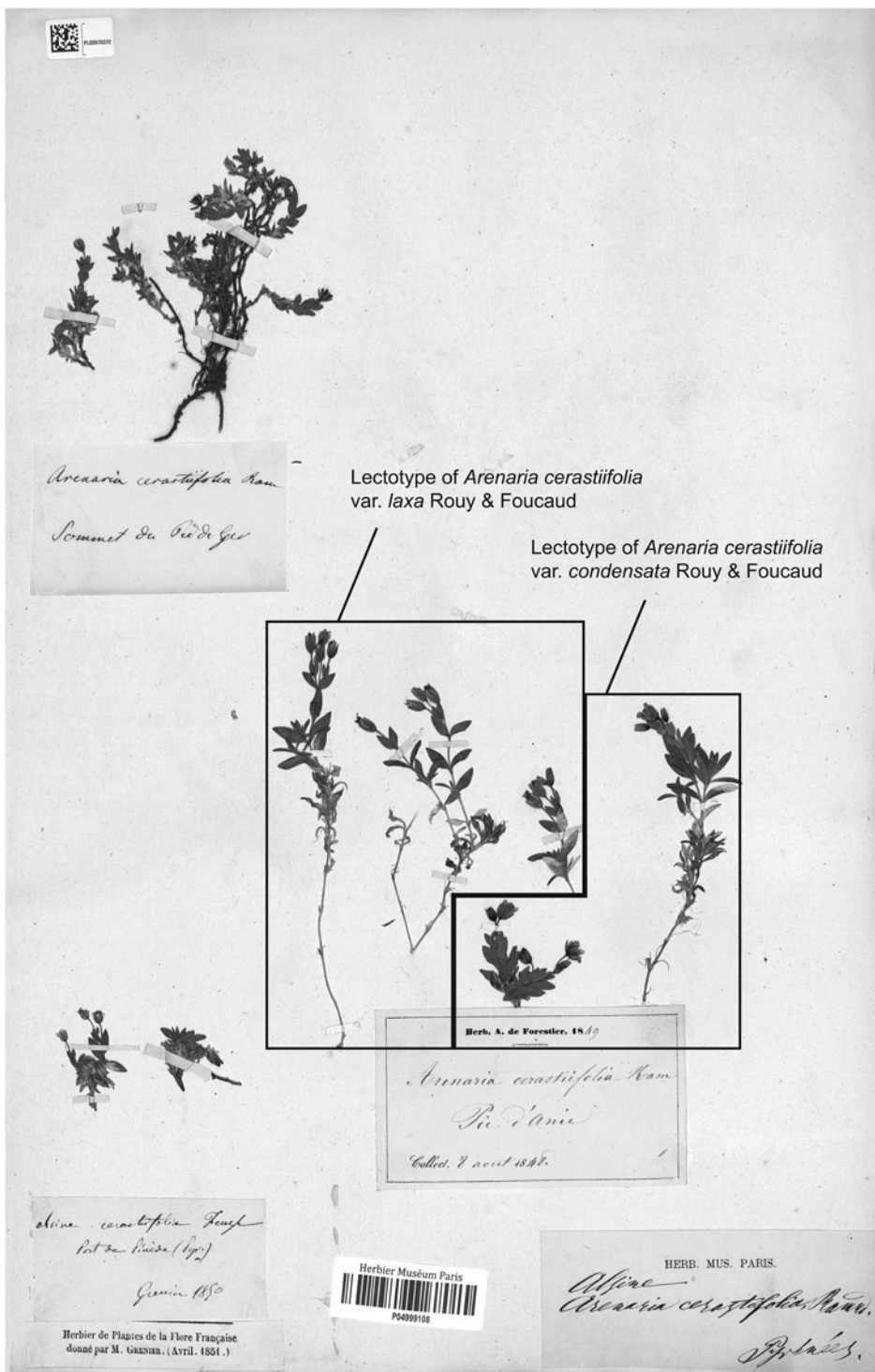
*Alsine cerastiifolia* var. *condensata* Rouy & Foucaud, Fl. France [Rouy & Foucaud] 3: 264. 1896. – Type: “*Arenaria cerastiifolia* Ram.”, Pic d’Anie, 8 viii 1848, *A. de Forestier* s.n. (lecto P barcode P04999108, one individual at the right of upper row of middle group of plants, individual below upper row of plants of middle group [photo!; see Fig. 3], designated here).

Plants caespitose, flowering stems erect, 2–8 cm tall, densely (glandular-)pubescent; leaves ovate-lanceolate (Fig. 1A), with (3–)5–7 veins, often only the middle vein prominent, 6.2–8 mm long, 2.5–3.5 mm wide, ciliate, densely pubescent on both sides. Flowers solitary or rarely in pairs. Pedicels 2–8 mm, densely pubescent. Sepals 5, ovate-lanceolate, 3.5–4.8 mm long, 1.6–2 mm wide, with 3–5 veins, acute, sometimes sparsely glandular-pubescent near midvein; petals 5, ovate-lanceolate, obtuse, 4.5–6.3 mm, exceeding sepals; stamens 10, anthers white to pinkish; styles 3; capsule valves 3, capsules 5–7.4 mm long, exceeding sepals.  $2n = 36$  (Çelebioğlu *et al.*, 1990).

*Distribution.* Central Pyrenees from Pic d’Anie to region around Gèdre, rare (Fig. 2B).

*Habitat and ecology.* Calcicole, alpine regions between 1800 and 3200 m.

*Typification and synonymy of *Facchinia cerastiifolia*.* – The specimen we choose as lectotype of the three homotypic names *Arenaria cerastiifolia*, *Ar. ramondii* and *Alsine glandulosa* corresponds best to the information in the protologues. In the protologue



*Arenaria cerastiifolia* Lam.  
Sommet du Pic de Joux

Lectotype of *Arenaria cerastiifolia*  
var. *laxa* Rouy & Foucaud

Lectotype of *Arenaria cerastiifolia*  
var. *condensata* Rouy & Foucaud



Herb. A. de Forestier, 1869  
*Arenaria cerastiifolia* Lam.  
Pic d'Anin  
Collect. 7 août 1869.

*Arenaria cerastiifolia* Lam.  
Pic de Joux (1869)  
Gamin 1850

Herbier Muséum Paris  
70499103

HERB. MUS. PARIS.  
*Arenaria cerastiifolia* Lam.  
P. J. L. S.

Herbier de Plantes de la Flore Française  
donné par M. Gussone. (Avril. 1851.)



of *Arenaria cerastiifolia* de Candolle (1805) wrote: “Elle sort des fentes des rochers à Troumouse, au fond de la vallée de Héas dans les Pyrénées, où elle a été observée par M. Ramond”. The specimen was collected by Ramond at Troumouse and is in de Candolle’s herbarium. In the protologue of *Alsine glandulosa* Dulac (1867) wrote: “Région alpine, fentes des rochers: Troumouse (Ram.; Bord.)”. There are specimens by Bordère from Troumouse in M and WU, but these were collected in 1877. We therefore decided to choose Ramond’s specimen. The information in the protologue of *Arenaria ramondii* is: “*Arenaria cerastiifolia* Decand. Synops. pag. 396, & Flor. franç. 4. pag. 783. – Ram. Pyr. ined.” As there is a direct reference to de Candolle (1805) and to Ramond, the type of *Facchinia cerastiifolia* therefore is the best choice as type of *Arenaria ramondii*.

In the description of *Arenaria cerastiifolia* var. *laxa* and var. *condensata* different specimens are given, but Rouy & Foucaud (1896) did not indicate separate specimens for their two varieties. One of the specimens cited was collected by de Forestier at the Pic d’Anie. We choose as types of both varieties individuals of the same specimen by de Forestier found in P. Since this specimen contains both types, and two other collections of *Facchinia cerastiifolia*, a photograph of the specimen is provided in Fig. 3 and the types are indicated.

*Additional specimens studied.* FRANCE. Gèdre (Hautes-Pyrénées), Tremouse, 1800 m, 19 viii 1877, *Bordère* s.n. (M barcode 0219782); Port de Pinède (Hautes-Pyrénées), viii 1870, *Bordère* s.n. (M barcode 0219783); in Pyrenaeis, s.d., *Boissier* s.n. (M barcode 0219784); Port de Pinède (Hautes-Pyrénées), s.d., *D. Lagger* s.n. (WU barcode 0071196); Campbieil (Hautes-Pyrénées), viii 1870, *Bordère* s.n. (WU barcode 0071197); Gèdre (Hautes-Pyrénées), Tremouse, 1800 m, 19 viii 1877, *Bordère* s.n. (WU barcode 0071198); Port de Pinède (Hautes-Pyrénées), viii 1872, *Bordère* s.n. (WU barcode 0071199); Troumouse (Hautes-Pyrénées), viii 1868, *Genia* s.n. (WU barcode 0071200); Rochers calcaires, Pic de Salettes vall. de Héas (Hautes-Pyrénées), viii 1878, *Bordère* s.n. (WU barcode 0071203); Val d’estaubé (Pyrénées), viii 1859, *Houffroy* s.n. (WU barcode 0071202); Rochers calcaires, Pic de Salettes vall. de Héas (Hautes-Pyrénées), viii 1878, *Bordère* s.n. (WU barcode 0071201); Port de Pinède (Hautes-Pyrénées), viii 1886, *Bordère* s.n. (Z barcode 000081044); Pyrénées, s.d., *s.coll.* s.n. (Z barcode 000081043); Eaux-Bonnes (Basses-Pyrénées), 2600 m, 18 viii 1879, *E. Doassans* s.n. (Z barcode 000081042); Port de Pinède (Hautes-Pyrénées), s.d., *D. Lagger* s.n. (Z barcode 000081041); Vallée d’Estaubé, 19 ix 1856, *Bordère* s.n. (Z barcode 000081040); Campbieil (Hautes-Pyrénées), vii 1869, *Bordère* s.n. (Z barcode 000081039); Campbieil (Hautes-Pyrénées), vii 1869, *Bordère* s.n. (Z barcode 000081038); Gèdre, Pic de Campbieil (Hautes-Pyrénées), 2000–3150 m, 29 viii 1906, *J. Soulié* s.n. (Z barcode 000081037); Pic du Campbieil (Hautes-Pyrénées), viii 1899, *Bordère* s.n. (Z barcode 000081036).

The distinction of *Facchinia cerastiifolia* from other species of *Facchinia* is easy. The shape of the leaves is different from all other species, and it is the only species



FIG. 3. Lectotypes of *Arenaria cerastiifolia* var. *laxa* Rouy & Foucaud and var. *condensata* Rouy & Foucaud. Muséum national d’Histoire naturelle, Paris (France); collection: Plantes vasculaires (P); specimen P04999108; accessible via <http://coldb.mnhn.fr/catalognumber/mnhn/p/p04999108>.

occurring in the Pyrenees. The other species grow in the Alps or in eastern Spain (near Valencia). Also, the capsules of *Facchinia cerastiifolia* are about 1.5 times longer than the sepals and thus much longer in relation to the sepals than in any other species. The variability of *Facchinia cerastiifolia* is very limited. Rouy & Foucaud (1896) recognised two varieties in *Facchinia cerastiifolia*. According to these authors, *Alsine cerastiifolia* var. *laxa* has a laxer habit, leaves that are shorter than the internodes and pedicels that are 1 to 2 times longer than the calyx in comparison to the more condensed habit of var. *condensata* with leaves that are distinctly longer than the internodes and pedicels that are equal to or slightly longer than the calyx (Rouy & Foucaud, 1896). Although some variation in habit exists, this is often seen among individuals from the same locality. Therefore, we do not follow these authors and accept one species without infraspecific taxa.

**2. *Facchinia cherlerioides*** (Sieber) Dillenb. & Kadereit, **comb. nov.** – *Schmidtia cherlerioides* Sieber, Hesperus 30: 67. 1813 [“*cherlerioides*”]. – *Siebera cherlerioides* Schrad. in Pl. alp. [Sieber] no. 76. 1813, nom. nud. – *Cherleria octandra* Sieber, Pl. alp. [Sieber] no. 76. 1813, nom. nud. – *Siebera cherlerioides* Hoppe in Flora 2: 24. 1819, superfluous. – *Cherleria octandra* Sieber ex Spreng., Syst. Veg. (ed. 16) [Sprengel] 2: 416. 1825 [Jan–May 1825]. – *Alsine cherlerioides* (Sieber) Dalla Torre, Anleit. Beob. Alpenpfl. 76. 1882. – *Alsine octandra* (Sieber ex Spreng.) Kerner, Fl. Exsicc. Austro Hung. II: 85. 1882 [“(Mert. & W.D.J.Koch) Kerner”]. – *Minuartia aretioides* subsp. *cherlerioides* (Sieber) Mattf., Bot. Jahrb. Syst. 57(Beibl. 126): 31. 1921. – *Minuartia cherlerioides* (Sieber) Bech., Denkschr. Schweiz. Naturf. Ges. 81: 167. 1956. – *Minuartia cherlerioides* (Sieber) Bech. subsp. *cherlerioides*. – *Somerauera cherlerioides* (Sieber) Á.Löve & D.Löve, Preslia 46(2): 127. 1974. – Type: [Austria], “76. *Cherleria octandra* Sieb., *Siebera cherlerioides* Schrad., auf hohen Alpen Tyrols, bei Linz, auf der Kirschbaumer-Alpe”, s.d., *F.W. Sieber* s.n. (lecto W barcode 0050703!, designated here; isolecto W barcode 303753!, W barcode 0006644!, HAL, GJO, BRNM).

*Cherleria imbricata* Ser., Prodr. 1: 421. 1824.

*Siebera argentea* Steud., Nomencl. Bot. [Steudel] 777. 1821, nom. nud.; ed. 2, 2: 582. 1841, nom. nud.

Plants caespitose, 2–5 cm tall; leaves oblong-elliptical (Fig. 1B), with 3(–5) veins, often only the middle vein prominent, 1.5–2.6 mm long, 1.1–1.2 mm wide, glabrous. Flowers solitary. Pedicels very short ( $\leq 1$  mm). Sepals 4, lanceolate, 1.4–2.9 mm long, 1.1–1.2 mm wide, with 3–5 veins, acute, glabrous; petals 4, lanceolate, slightly exceeding sepals, or petals absent; stamens 8, anthers white to yellowish; styles 3, sometimes 4 in single flowers; capsule valves 3, rarely 4, capsules 2.4–2.7 mm long.  $2n = 36$  (Çelebioğlu *et al.*, 1990).

*Distribution.* Northern and southern calcareous Alps (Fig. 2A).

*Habitat and ecology.* Calcicole, in fissures of large rocks or walls, (1900–)2000–2900 (–3000) m.

*Taxonomy of* *Facchinia cherlerioides*. – The epithet has been in use for a long time and has been accepted as correct (e.g. Hoppe, 1819; Dalla Torre, 1882; McNeill, 1962; Aeschmann *et al.*, 2004), though its authorship has been wrongly attributed. It was thought that Hoppe (1819) first published this epithet in a valid name, and that only a nomen nudum existed before that. However, *Schmidtia cherlerioides* Sieber is an earlier and validly published name. Although the genus is invalid, due to the existence of an earlier homonym (*Schmidtia* Moench 1802, Asteraceae) and a later conserved name (*Schmidtia* Steudel ex J.A.Schmidt 1852, Poaceae), the authorship of the epithet has to be changed to Sieber instead of Hoppe.

Traditionally, *Facchinia cherlerioides* has been regarded as containing two subspecies with non-overlapping distribution ranges (Fig. 2A) in the Alps, namely *Minuartia cherlerioides* subsp. *rionii* (Gremlí) Friedrich (= *F. herniarioides*) with ciliate leaves from siliceous rocks and subsp. *cherlerioides* with non-ciliate leaves from calcareous rocks. Our molecular analysis of the genus (Dillenberger & Kadereit, unpublished) indicates that *Facchinia cherlerioides* is not monophyletic. Therefore, subsp. *rionii* will here be treated as *Facchinia herniarioides* (Rion) Dillenb. & Kadereit (see below). *Facchinia cherlerioides* can be divided into two subspecies based on morphological and geographical evidence. This was proposed by Wraber in Fischer *et al.* (1994), and a name was proposed in the second edition (Fischer *et al.*, 2005).

#### Key to the subspecies

- 1a. Petals absent; southern calcareous Alps \_\_\_\_\_ subsp. **cherlerioides**  
 1b. Petals present; northern calcareous Alps \_\_\_\_\_ subsp. **aretioides**

#### 2a. *Facchinia cherlerioides* (Sieber) Dillenb. & Kadereit subsp. **cherlerioides**

Petals absent.

*Distribution.* Southern calcareous Alps (Fig. 2A).

*Additional specimens studied.* AUSTRIA. Kirschbaumeralp, s.d., *Hargasser* s.n. (M barcode 0156320); Kirschbaumeralpe bei Lienz in Tirol, s.d., *Dr. Bischoff* s.n. (WU barcode 0071181); Kerschbaumeralpe b. Lienz, s.d., *Braun* s.n. (WU barcode 0071188); Karnische Alpen, Gipfelpyramide und S-Seite des Gartnerkofels, 2050–2195 m, 21 viii 1961, *Ehrendorfer* s.n. (WU barcode 0071167); Kärnten, Gailtal, Karnische Alpen, auf Felsblöcken des Polinig bei Mauthen, 2150 m, 23 viii 1926, *F. Vierhapper* s.n. (WU barcode 0071217); Kärnten, Lienzer Dolomiten, Riebenkofel, Karlalm, 2100 m, 11 ix 1998, *G.M. Schneeweiß* 2533 (WU barcode 0071218); Kärnten, Lienzer Dolomiten, Weittalspitze, 2300 m, 18 ix 1998, *G.M. Schneeweiß* 2550 (WU barcode 0071219); Kerschbaumeralpe bei Lienz, s.d., *Zaunig?* s.n. (WU barcode 0071230); Kerschbaumeralpe, s.d., *s.coll.* s.n. (WU barcode 0071231); Tirol. orient. Kerschbaumeralpe pr. Lienz, 7000', 16 viii 1870, *Gander* s.n. (WU barcode 0071174); Tyrol, s.d., *s.coll.* s.n. (ZT barcode 00035512); Kerschbaumeralpe in Tirol, 1854?, *Huter* s.n.

(ZT barcode 00035511); in summ. Alp. Tyrol, s.d., *Sieber* s.n. (W barcode 303753); Auf hohen Alpen Tyrols, bei Linz, auf der Kirschbaumer-Alpe, s.d., *Sieber* s.n. (W barcode 303753); Auf hohen Alpen Tyrols, bei Linz, auf der Kirschbaumer-Alpe, s.d., *Sieber* s.n. (W barcode 0050703); Auf hohen Alpen Tyrols, bei Linz, auf der Kirschbaumer-Alpe, s.d., *Sieber* s.n. (W barcode 0006644); in summ. Alp. Tyrol, s.d., *Sieber* s.n. (W barcode 0006644); Kirschbaumeralpe bei Lienz in Tirol, iv 1825, *Hinterhuber* s.n. (W barcode 0006644).

ITALY. Bozen, Peitlerkofel/Sas de Pütia (St. Martin in Thurn), MTB 9336/2, 2370–2875 m, 14 vii 1996, *H. Staffler* s.n. (BOZ barcode 7003); Prov. di Belluno, S. Vito del Cadore, 2400 m, 17 viii 1908, *R. Pampanini* s.n. (F barcode 5255 3); Prov. di Belluno, sopra Passo Sella, 2600 m, 28 viii 1970, *E. Feoli* s.n. (F barcode 5255 2); Trentino, Dolomiti, Da Passo Sella al Rifugio Col Rodella (Bolzano), 2214–2486 m, 13 viii 1956, *A. Chiarugi*, *R. Corradi* & *R. Bavazzano* s.n. (F barcode 5255 1); Seiseralpe, vii 1823, s.coll. s.n. (M barcode 0156409); Schlernplateau, 31 vii 1900, *Arnold* s.n. (M barcode 0156408); in mte. Wischberg, 6000–7000', 16 vii 1875, *Huter* s.n. (M barcode 0156401); Grödner Tal, Fuorcla La Roa, 2200 m, 22 vii 1900, *Arnold* s.n. (M barcode 01564007); Südtirol, Schlerngebiet bei Bozen, z.B. am Plattkofel, 2300–2900 m, vii 1905, *M. Hellweger* s.n. (M barcode 0156403); Brenta (Südtirol), an Felsen auf dem M. Spinale, 2100 m, 02 vii 1934, *H. Paul* s.n. (M barcode 0156404); Dolomiten, Felsen auf den Sellajoch, 2200 m, 11 viii 1930, *Paul* s.n. (M barcode 0156405); Vajolett-Tal (Schlern), 08 viii 1900, *Arnold* s.n. (M barcode 0156406); am Flöderach bei Höllenstein, Südtirol, 02 vii 1843, *Papperitz* s.n. (M barcode 0156323); am Flöderach bei Höllenstein, Südtirol, 02 vii 1843, *Papperitz* s.n. (M barcode 0156424); Dolomiten, Grödnertal, Piz Boe, um die obere Station der Boe-Seilbahn, 10 viii 1997, *O. Angerer* s.n. (M barcode 0156241); Venetien, Drei Zinnen, Tre Cime di Lavaredo, 12°17'49"E 46°36'51"N, 2402 m, 26 vii 2013, *M.S. Dillenberger* 13070 (MJG barcode 012506); Südtirol, Schlern (Sciliar), Mt. Pez, 11°34'31"E 46°30'47"N, 2551 m, 09 vii 2012, *M.S. Dillenberger* 201297 (MJG barcode 009845); Trentino, Felswand (Kalk) auf der nördlichen Seite des Col Rodela, 11°44'49"E 46°29'46"N, 2418 m, 10 vii 2012, *M.S. Dillenberger* 2012110 (MJG barcode 009856); Südtirol, Rosengartengruppe, Kalk-Felsen entlang des Wandersteigs von der Rosengarten-Hütte zum Rosengarten, 11°36'44"E 46°26'34"N, 2350 m, 10 vii 2012, *M.S. Dillenberger* 2012100 (MJG barcode 009857); Venetien, Kalkfelsen entlang der Straße zwischen dem Passo di Valparola und dem Passo di Falzarego, 11°59'49"E 46°31'57"N, 2206 m, 12 vii 2012, *M.S. Dillenberger* 2012114 (MJG barcode 009867); Südtirol, Rosengartengruppe, Kalk-Felsen entlang des Wandersteigs von der Rosengarten-Hütte zum Rosengarten, 11°36'44"E 46°26'34"N, 2350 m, 10 vii 2012, *M.S. Dillenberger* 2012100 (MJG barcode 009873); Trentino, Langkofel-Plattkofel-Gruppe, Kalk-Felsen an der Bergstation der Seilbahn, 11°44'26"E 46°30'57"N, 2686 m, 11 vii 2012, *M.S. Dillenberger* 2012113 (MJG barcode 009876); Trentino, Passo di Sella (Sellajoch), 11°46'15"E 46°30'36"N, 2279 m, 11 vii 2012, *M.S. Dillenberger* 2012112 (MJG barcode 009877); Lavaredo (Alpes Dolomites Italiano), vii 81, *Manjam?* & ? s.n. (VAL barcode 69954); Venetia – Prov. Di Belluno, S. Vito del Cadore, in ca-cumine montis Rocchetta, 2400 m, 17 viii 1908, *R. Pampanini* s.n. (WU barcode 0071176); Südtirol, s.d., *Facchini* s.n. (WU barcode 0071175); Tirolia austr., Schlern bei Bozen, Felsen unter der Passian-Kapelle, 2330 m, 20 viii 1908, *H. Frh. v. Handel-Mazzetti* s.n. (WU barcode 0071177); Schlern, 1863, *Tschurtschenthaler* s.n. (WU barcode 0071178); Bocca di Brenta, 19 vii 1881, *M. de Sardagna* s.n. (WU barcode 0071179); Süd-Tirol, Schlern bei Bozen, 2550 m, 13 vii 1905, *H. Frh. v. Handel-Mazzetti* s.n. (WU barcode 0071180); Cima Dodici, s.d., *Schmi?* s.n. (WU barcode 0071182); Val babena alta, S. Tyrol, vii 1873, *K. Grimus* v. *Grimburg* s.n. (WU barcode 0071183); Südtirol, Pustertal, Dürrenstein bei Schluderbach, vii 1903, *F. Vierhapper* s.n. (WU barcode 0071184); Schlern, s.d., *Hepperger* s.n. (WU barcode 0071191); Tirol, Sexten, 25 vi 1862, *Gander* s.n. (WU barcode 0071190); Tirol. austr. orient. in monte Dürrenstein Pusteriae med. in rupium calcar., 8000', 02 viii 1870, *Huter* s.n. (WU barcode 0071168); Tirol, Schlern – Fassa, s.d., *A. Zimetes* s.n. (WU barcode 0071171); Tirol, Schlern – Fassa, s.d., *A. Zimetes* s.n.

(WU barcode 0071172); an Felsen der höhern Alpen, Plattkofel auf der Seiseralpe, s.d., *P. Morandel* s.n. (WU barcode 0042485); Tirol. austr., ad saxa nuda dolomit. M. Rosengarten, 2000 m, s.d., *s.coll.* s.n. (Z barcode 000078503); Faßthal in Südtirol, s.d., *T. Facchini* s.n. (Z barcode 000078502); Venetia – Prov. Di Belluno, S. Vilo del Cadore, in cumine montis Rocchetta, 2400 m, 17 viii 1908, *R. Pampanini* s.n. (Z barcode 000078501); Schlern, s.d., *Zaunig?* s.n. (Z barcode 000065496); Schlernalm, Tirol, 2480 m, 1907, *Bornmüller* s.n. (Z barcode 000065495); au col du Schlehergebirge entre Botzen et Vigo (Tyrol mirid), 01 x 1851, *Müller. Aug.* s.n. (ZT barcode 00035518); zum Schlehern in Südtirol, s.d., *E??mann* s.n. (ZT barcode 00035515); Tirol. austr., ad saxa auda dolomit m. Rosengarten, 2000 m, s.d., *Dr. F. Sauter* s.n. (ZT barcode 00035510); Plattkogel, mons Tyrol. Occid., viii, *Rehsteiner* s.n. (ZT barcode 00035509); Südtirol, Dolomiten, häufig in Felsspalten auf dem Gipfel der Nuvolaun bei Cortina d'Ampezzo, 2575 m, s.d., *C. Schröder?* s.n. (ZT barcode 00035508); Langkofel, 06 vii 1961, *W. Trepp* s.n. (ZT barcode 00035507); Venetia – Prov. Di Belluno, S. Vilo del Cadore, in cumine montis Rocchetta, 2400 m, 17 viii 1908, *R. Pampanini* s.n. (ZT barcode 00035506); Schlern in Südtirol, 1894, *coll. illegible* s.n. (ZT barcode 00035502); Schlern bei Botzen, s.d., *D. Lagger* s.n. (ZT barcode 00014000); in rupibus calcariis Tirol austro-oriental., s.d., *Dr. Facchini* s.n. (ZT barcode 00013999); in Tirolia austalis et Carinthiae superioris alpi-bus, 7000', s.d., *D. Lagger* s.n. (ZT barcode 00013998); Venetia – Prov. Di Belluno, S. Vilo del Cadore, in cumine montis Rocchetta, 2400 m, 17 viii 1908, *R. Pampanini* s.n. (ZT barcode 00013997); Tyrol. austro-orientalis, s.d., *D. Lagger* s.n. (ZT barcode 00035527); Bozen, Zsigmondy-Comici-Hütte (Sexten), 12°21'9"E 46°37'44"N, 2310 m, 22 vii 2003, *A. Hilpold & T. Kiebacher* s.n. (BOZ barcode 2428); Ex alpe Schlehern in Tyrol. austral., s.d., *s.coll.* s.n. (W barcode 0006644); In Fassa, in Ampezzo, auf dem Berge Castelazzo in Fiemmo, s.d., *s.coll.* s.n. (W barcode 0006644).

**2b. *Facchinia cherlerioides* subsp. *aretioides*** (Port. ex J.Gay) Dillenb. & Kadereit, **comb. nov.** – *Arenaria aretioides* Port. ex J.Gay, Ann. Sci. Nat. (Paris) 3: 34. 1824. – *Arenaria aretioides* Sommerauer, Flora 2: 20 nomen, 21 descript. 1819; inval., Art. 36.1b. – *Someraueria quadrifaria* Hoppe, Flora 2: 26. 1819, inval. Art. 36.1b, often misspelled *Someraueria quadrifida*. – *Alsine aretioides* (Port. ex J.Gay) Mert. & W.D.J.Koch, Deutschl. Fl. ed. 3(3): 277. 1831. – *Minuartia aretioides* (Port. ex J.Gay) Schinz & Thell., Bull. Herb. Boissier Ser. 2(7): 403. 1907. – *Minuartia aretioides* (Port. ex J.Gay) Schinz & Thell. subsp. *aretioides*. – *Sabulina aretioides* (Port. ex J.Gay) Hayek, Sched. Fl. Stiriac. Exsicc. III–IV: 6. 1905. – *Minuartia cherlerioides* subsp. *quadrifaria* (Hoppe) Wraber, Exkursionsflora für Österreich, Liechtenstein und Südtirol, ed. 2: 321. 2005, nom. inval. – Type: Austria, Kalbling in Styria, s.d., *Sommerauer* s.n. (lecto WU barcode 0071221!, designated here).

Petals four, white, lanceolate.

*Distribution.* Northern calcareous Alps (Fig. 2A).

*Typification and synonymy of *Facchinia cherlerioides* and its subspecies.* – It was not possible to find original material for all synonyms of *Facchinia cherlerioides* listed above. However, with the types that could be found and information from the literature it is possible to justify the synonyms listed.

Sommerauer (1819) sent the plants that he provisionally called *Arenaria aretioides* to Hoppe, who gave them the provisional name *Someraueria quadrifaria*. Therefore,

*Somerauera quadrifaria* Hoppe and *Arenaria aretioides* Sommerauer must have the same type. The chosen type closely matches the description by Sommerauer (1819) who collected the plants himself on the Kalbling in Styria. We also chose this specimen as type of *Arenaria aretioides* Port. ex J. Gay since it is likely that Portenschlag-Ledermayer saw this specimen. Sommerauer (1819) also sent plants from his collection on the Kalbling to botanists in Vienna where Portenschlag-Ledermayer worked.

The first description of *Cherleria imbricata* Ser. is dubious. The affiliation to *Cherleria* was doubted (indicated as “C?”), the life form was unclear (indicated as “ $\mathcal{F}$ ?”) and the distribution range is wrong for the intended species (Carinthia, Tyrol and in Siberia). By writing “cherlerioides Hoppe?”, Seringe (1824) himself indicated the possible synonymy of *Cherleria imbricata* with *Siebera cherlerioides*. In the same year Gay (1824) validated the name *Arenaria aretioides* and gave *Cherleria imbricata* as synonym. Since this has never been doubted and the name *Cherleria imbricata* has never been used, it seems reasonable to keep it as a synonym of *Facchinia cherlerioides*. As regards the nomen nudum *Siebera argentea* Steud., Steudel (1841) himself gave *Cherleria imbricata* Ser. as synonym for his species and for *Siebera cherlerioides*, indicating the synonymy of all three names.

For *Cherleria octandra* Sieb. ex Spreng. and *Schmidtia cherlerioides* Sieber we choose as type a specimen by Sieber collected for his “Plantae alpinae” Fasc. VI, where it was no. 76. The information on the label fits best with the information in the protologue of *Schmidtia cherlerioides*. The two nomina nuda *Cherleria octandra* Sieb. and *Siebera cherlerioides* Schrad. were published first in Sieber’s “Plantae alpinae”, therefore a specimen of this collection is the best choice as type specimen of both names. Since Sieber sold his specimens, more isoelectotypes with the label cited may be found in other herbaria. One specimen in W (barcode 0050703) was part of the Sprengel herbarium, and was therefore chosen as lectotype.

*Additional specimens studied.* AUSTRIA. Styria superior, in declivibus rupestribus montis Sinabell prope pagum Schladming in alpebus “Dachsteingruppe”, 2100–2300 m, vii 1905, *A. v. Hayek* s.n. (ZT barcode 00035505); Lungau (Salzburg), Radstädter Tauern, Hauptkamm-Felsen des Faulkogel, 2450 m, ix 1919, *F. Vierhapper* s.n. (ZT barcode 00035504); Stiria superior, in rimis rupium montis Sparafeld prope Admont, 2200 m, s.d., *Strobl* s.n. (ZT barcode 00035501); Stiria superior, in rimis rupium montis Sparafeld prope Admont, 2200 m, s.d., *Strobl* s.n. (ZT barcode 00013996); Steiermark, Hochschwab, Gipfelregion, s.d., *F. Vierhapper* s.n. (WU barcode 00711220); Kalbling in Styria, s.d., *Sommerauer* s.n. (WU barcode 0071221); Stiria superior, in declivibus rupestribus montis Sinabell prope pagum Schladming in alpebus “Dachsteingruppe”, 2100–2300 m, vii 1905, *A. v. Hayek* s.n. (WU barcode 0071222); Buchstein, Hochschwab Spitze, 08 viii 1848, *s.coll.* s.n. (WU barcode 0071223); Kalbling, s.d., *s.coll.* s.n. (WU barcode 0071224); Berg Kalbling in Oberstyria, s.d., *Gebhard* s.n. (WU barcode 0071225); Steiermark, Hochschwab im Gesäuse, 15 vii 1903, *F. Vierhapper* s.n. (WU barcode 0071226); Stiria sup. M. Sparafeld, Admont, s.d., *Strobl* s.n. (WU barcode 0071227); Hochschwab, s.d., *M. Hölzl* s.n. (WU barcode 0071175); Steiermark, “G’hacktes” am Hochschwab an Felsen, 1900 m, 17 vii 1903, *H. Frh. v. Handel-Mazzetti* s.n. (WU barcode 0071228); Kalbling, s.d., *Welden* s.n. (WU barcode 0071229); Flora Admontensis, um die Spitze des Buchstein, 7000’, 18 vii 1872, *F.G. Strobl* s.n. (Z barcode 000056492); Stiria superior, in declivibus rupestribus montis Sinabell prope pagum Schladming in alpebus “Dachsteingruppe”, 2100–2300 m, vii

1905, *A. v. Hayek* s.n. (Z barcode 000065491); Stiria, in monte Eselstein prope Schladming, 2300 m, 30 vii 1902, *Hayek* s.n. (Z barcode 000065490); Styria, um die Spitze des Buchstein, 7000', 18 vii 1872, *F.G. Strobl* s.n. (ZT barcode 00035513); Hochschwab, 17 viii 1851, *D. Sturz & J. Jaeger* s.n. (ZT barcode 00035514); Alpe Hohe Priel, Oberösterreich, 7940', s.d., *Keck* s.n. (ZT barcode 00035519); Großer Priel, 7000', 05 viii 1875, *Oberleitner* s.n. (WU barcode 0071213); Kalkfelsen am Warscheneck bei Windischgarsten, 7000', 11 viii 1865, *Oberleitner* s.n. (WU barcode 0071214); Plateau des Warscheneck bei Windischgarsten in Oberösterreich, 7800', 02 viii, *Oberleitner* s.n. (WU barcode 0071215); Warscheneck, 7822', 30 vii 1862, *Oberleitner* s.n. (WU barcode 0071216); Salzburg, Radstädter Tauern, Weißbeck, 2500–2711 m, 30 vi 2002, *A. Tribsch* 8776 (WU barcode 0029032); Südseite d. Kammes d. Fritzer-Kogels, 07 viii 1916, *Ginzberger* s.n. (WU barcode 0071204); Radstädter Tauern, Hochfein-Kette, 2300 m, viii 1917, *F. Vierhapper* s.n. (WU barcode 0071205); Radstädter Tauern, Weisseck-Kette, Riedingspitze im Hinterrieding, ix 1920, *F. Vierhapper* s.n. (WU barcode 0071206); Radstädter Tauern, Mittereck-Kette, Vesselspitze im Taurachwinkel, ix 1916, *F. Vierhapper* s.n. (WU barcode 0071207); Radstädter Tauern, Hauptkamm-Felsen am Fuße des Faulkogel im Zederhauswinkel, viii 1919, *F. Vierhapper* s.n. (WU barcode 0071208); Flora Salisburgensis, Felsgestein des "Rauchfang" an Hohen Göll bei Hallein, 2200 m, vii 1893, *F. Vierhapper* s.n. (WU barcode 0071209); Flora Salisburgensis, Göll bei Hallein: Felsen des "Rauchfang" am Hohen Göll, 21 vii 1893, *F. Vierhapper* s.n. (WU barcode 0071210); Radstädter Tauern, Hauptkamm Mosermandl im Zederhauswinkel, viii 1904, *F. Vierhapper* s.n. (WU barcode 0071211); Flora Salisburgensis, höchste Kalkalpen bei Lofer, s.d., *F.P. Storch* 18 (WU barcode 0071212); Ober-Österreich, auf dem "großen Priel" im Hinterstoder, 1871, *Kerner* s.n. (WU barcode 0071169); auf dem Windfeld des Radstädtertauern, 6500', 30 vii 1870, *F.G. Strobl* s.n. (WU barcode 0071170); Kalbling, Obersteiermark, s.d., *Bidtermann* s.n. (WU barcode 0042486); Ebenstein, viii 05, *s.coll.* s.n. (WU barcode 0071189); Sinabell bei Ramsau, 2100 m, 08 viii '33, *B. Fest* 844 (WU barcode 0071232); Rochers calcaires dans les Alpes de la Haute-Autriche, près de Windischgarsten, 2600 m, 02 viii 1862, *Oberleitner* s.n. (M barcode 0156418); Hochschwab, Aufstieg zu "Gehacktes", 10 vii 1971, *O. Angerer* s.n. (M barcode 0156242); Salzburg, Radstädter Tauern, Kalkfelsen an der Zehnerkarsspitze, 2300 m, 23 viii 1973, *B. Zollitsch* s.n. (M barcode 0156238); Tirol, Hundstod-Gipfel (Steinernes Meer), 2590 m, 29 vii 1934, *E. Hepp* s.n. (M barcode 0156237); Radstädter Tauern, am Sattel zwischen Hundskogel und Plattenspitze, 2160 m, 10 viii 1962, *B. Zollitsch* s.n. (M barcode 0156236); Salzburg, Radstädter Tauern, am Sattel zwischen Hundskogel und Plattenspitze, 2160 m, 10 viii 1962, *B. Zollitsch* 1516 (M barcode 0156235); Hochschwab, Gipfelrasen, 2277 m, 25 vii 1952, *H. Merxmüller & W. Wiedmann* s.n. (M barcode 0156234); Rochers calcaires dans les Alpes de la Haute-Autriche, près de Windischgarsten, 2600 m, 02 viii 1862, *Oberleitner* s.n. (M barcode 0156233); Steiermark, Hochschwab, von der Bürgeralm über Keisthaller Hütte, über Klettersteig "Das Gehackte" zum Hochschwab-Gipfel, 2210 m, 07 vii 1973, *J. Schimmitat* s.n. (M barcode 0219781; photograph specimen); Steiermark, Admont, Kalkfelsen am Gipfelkreuz des Kalblings, 14°31'15"E 47°32'50"N, 2199 m, 24 vii 2013, *M.S. Dillenberger* 13062 (MJG barcode 012510); Salzburg, Östliches Ende der Berchtesgadener Alpen, Kalkfelsen am Schneibstein, 3°3'18"E 47°33'45"N, 2242 m, 22 vii 2013, *M.S. Dillenberger* 13060 (MJG barcode 012500); Oberösterreich, Dachstein-Gruppe, Kalk-Felsen am Kleinen Gjaidstein, 13°37'34"E 47°28'20"N, 2643 m, 18 vii 2012, *M.S. Dillenberger* 2012138 (MJG barcode 009860); Flora Admontensis, um die Spitze des Buchstein, 7000', 18 vii 1872, *F.G. Strobl* s.n. (F barcode 5255 4); Salzburger Alpen, Steinernes Meer, auf der Schönfeldspitze, 2400–2600 m, 01 viii 1945, *H. Merxmüller* s.n. (M barcode 0156240); Salzburger Alpen, Watzmann, am Hocheck, 2500 m, 22 v 1934, *H. Merxmüller* s.n. (M barcode 0156239); Oberösterr. Kalkalpen, Felsritzen des Warscheneck b. Windischgarsten, 7822', viii 1862, *Oberleitner* s.n. (M barcode 0156371); Stiria superior, in rimis rupium montis Sparafeld prope Admont, 2200 m, s.d., *Strobl* s.n. (M barcode

0156396); in rupibus calcareis circa Admontes, Styria sup., 03 viii 1882, *G. Strobl* s.n. (M barcode 0156395); Flora Styriae superioris, Kalbling, 2000 m, 20 viii 1890, *G. Strobl* s.n. (M barcode 0156394); Kalbling, s.d., *G?* s.n. (W barcode 303753); auf dem Kalbling bei Admont in Steiermark, *Mielichhofer* s.n. (W barcode 303753).

GERMANY. Berchtesgadener Alpen, Kammerlinghorn, 2500 m, 15 vii 1901, *Arnold* s.n. (M barcode 0156388); Berchtesgaden, Felsspalten am Funtenseetauern, 2500 m, 28 viii 1919, *H. Paul* s.n. (M barcode 0156387); vom Gipfel des Kammerlinghorn am Hirschbichl bei Berchtesgaden in Oberbayern, 15 viii 1853, *A. Progel* s.n. (M barcode 0156386); Kammerlinghorn, 31 vii 1850, *O. Sendtner* s.n. (M barcode 0156390); Kammerhorn, s.d., *Spitzel* s.n. (M barcode 0156392); in montibus Hochgöhl, Brett, Schneibstein legit Einfelde, in monte Watzmann, s.d., *Schenk* s.n. (M barcode 0156391); Gipfel des Kammerlinghorns bei Hirschbichl, 2450 m, 14 viii 1922, *coll. illegible* s.n. (M barcode 0156393); Watzmann-Scharte, 04 ix 1832, *Berger* s.n. (M barcode 0156397); Bavaricae australis. Watzmann, 8578', 13 viii 1890, *Glück* s.n. (M barcode 0156389); Bayern, MTB 8443/34, Steinernes Meer, Rotleitenschneid-Gipfelregion, 2229 m, 13 vii 1998, *F. Eberlein* s.n. (M barcode 0156249); Bayern, MTB 8443/1, Hochkaltergebiet, Bereich Schönfleck-Rootpalfen-Kleinkalter, 2060 m, 03 viii 1998, *M. Trautenhahn* s.n. (M barcode 0156248); Bayern, Berchtesgadener Alpen, Eisbodenscharte, 2049 m, 05 viii 2005, *U. Kohler* [05/157] (M barcode 0156247); Bayern, Berchtesgadener Alpen, Gemeinde Schönau, Nordflanke Kleiner Watzmann, 2200 m, 10 viii 2005, *Ch. Mayr* [05/15] (M barcode 0156246); Bayern, Berchtesgadener Alpen, Hochscheibe, 2395 m, 20 vii 2006, *A. Buchholz* K63 (M barcode 0156245); Reitalpe, s.d., *s.coll.* s.n. (M barcode 0156319); Oberbayern, Fundenseetauern Gipfel, 7888', 23 viii 1850, *Sendtner* s.n. (M barcode 0156421); Oberbayern, Gamsscheibe am Grünsee bei Berchtesgaden, 6443', 24 ix 1850, *Sendtner* s.n. (M barcode 0156420); von der Kuppe des Hochgöhl in Berchtesgaden, 30 vii 1848, *Einsele* s.n. (M barcode 0156417); von der Kuppe des Göhl in Berchtesgaden, 19 vii 1846, *Einsele* s.n. (M barcode 0156416); Kammerlinghorn, 7644', 31 vii 1850, *Sendtner* s.n. (M barcode 0156415); Oberbayern, Hochkalter nahe dem Gipfel und südlich unter demselben, 03 viii 1850, *Sendtner* s.n. (M barcode 0156414); Hundstodgipfel, 7990', 23 vii 1850, *Dr. J. Roth* s.n. (M barcode 0156413); Watzmann-Scharte, viii 1846, *Spitzel* s.n. (M barcode 0156411); Oberbayern, Watzmann um das 3te Steinmandl, 7152', 17 vii 1850, *Sendtner* s.n. (M barcode 0156410); Oberbayern, Berchtesgaden, Kammerlinghorn, 12 viii 1903, *F. Vollmann* s.n. (M barcode 0156252); Bayern, Watzmann-Massiv, MTB 8443/2, Watzmann-Kar, 2232 m, 12 vii 1992, *W. Lippert* 26109 (M barcode 0156251); Bayern, MTB 8443/13, Hochkalter, Steintalhörndl, 2467 m, 26 vii 1999, *F. Eberlein* s.n. (M barcode 0156250); Bayern, Berchtesgadener Alpen, Steinernes Meer, Rotleiterschneid Gipfelgrat, 2220 m, 11 viii 2005, *A. Buchholz* K61 (M barcode 0156244); Oberbayern, Berchtesgaden, Hoher Göll, c.2400 m, 03 viii 1903, *F. Vollmann* s.n. (M barcode 0156243); Oberbayern, Berchtesgadener Land, Aufstieg vom Jägerkreuz (2182m) am Hörndlbrett zum Gipfel des Hohen Bretts (2340m), 2182–2340 m, 25 vii 1999, *H. Förther* 10366 (MSB barcode 003605); Watzmann bei Berchtesgaden, im Gestein um das Hoheck, 28 vii 1893, *F. Vierhapper* s.n. (WU barcode 0071187); Watzmann, s.d., *Sauter* s.n. (WU barcode 0071186); Watzmann bei Berchtesgaden in Oberbayern, s.d., *Spitzel* s.n. (WU barcode 0071175); in summis alp. Bavar., 1823, *Schultes* s.n. (WU barcode 0071185); Kammerling, s.d., *T. Sch?* s.n. (ZT barcode 00035516); Oberbayern, Kallersberg, 7262', 29 viii 1850, *Sendtner* s.n. (M barcode 0156419); in monte Untersberg, 1826, *Hinterhuber* s.n. (W barcode 303753).

**3. *Facchinia grignensis* (Rchb.) Dillenb. & Kadereit, comb. nov.** – *Tryphane grignensis* Rchb., Deutschl. Fl. 3: 88. 1842. – *Arenaria grigneensis* E.Thomas, Cat. Suppl.: 1. 1842, nom. nud. – *Moehringia thomasiana* J.Gay ex Bertol., Fl. Ital. [Bertoloni] 6:



625. 1844. – *Alsine grineensis* Gren. & Godr., Fl. France 1: 252. 1847. – *Alsine villarsii*  $\beta$  *grineensis* (Gren. & Godr.) Tanfani, Fl. Ital. [Parlatore] 9: 590. 1892. – *Alsine thomasiana* (J.Gay ex Bertol.) Degen, Oesterr. Bot. Z. 44: 446. 1894. – *Alsine thomasiana* (J.Gay ex Bertol.) Sommier in Bull. Soc. Bot. Ital. ser. II, 2: 44. 1895. – *Alsine austriaca*  $\beta$ . *villarsii* c. *grineensis* (Gren. & Godr.) Fiori, Fl. Italia [Fiori, Béguinot & Paoletti] 1: 343. 1898. – *Minuartia grineensis* (Gren. & Godr.) Chenevard, Bull. Soc. Bot. Genève, ser. 2, 4: 71. 1912. – *Minuartia grineensis* (Gren. & Godr.) Mattf. in Repert. Spec. Nov. Regni Veg. Beih. 15: 141. 1922, superfluous. – *Minuartia villarsii* var. *grineensis* (Gren. & Godr.) Wilczek & Chenevard, Annuaire Conserv. Jard. Bot. Genève 15: 256. 1912. – *Minuartia flaccida* subsp. *grineensis* (Gren. & Godr.) Graebn. in Asch. & Graebn., Syn. Mitteleur. Fl. 5(1): 758. 1918. – *Alsine flaccida*  $\gamma$  *grineensis* (Gren. & Godr.) Fiori, Nuov. Fl. Italia 1: 461. 1923. – *Someraueria grignensis* (Rchb.) Á.Löve & D.Löve, Preslia 46(2): 127. 1974 [“*grigneensis*”]. – Type: Italy, “*Arenaria grineensis* Thom.”, La Grigna montagne de la Valsasina, s.d., *E. Thomas* s.n. (lecto JE barcode 00014429 [photo!], designated here).

Stems erect, 6–8 cm tall; plants completely glabrous; leaves linear (Fig. 1C), with 3 veins, only the middle vein prominent, 10–16.2 mm long, 0.9–1.2 mm wide, not ciliate. Flowers sometimes solitary, usually inflorescences with 3–7(–12) flowers; pedicels 8–15 mm, sepals 5, lanceolate to ovate, 2.5–3.7 mm long, 0.8–1.4 mm wide, usually with 3–5 veins, acute; petals 5, ovate-lanceolate, acute, exceeding sepals by c.2–3 mm; stamens 10, anthers white to yellowish; styles 3; capsule valves 3, capsules 4.1–4.3 mm long.  $2n = 36$  (Favarger, 1959).

*Distribution.* Restricted to the Bergamo Alps: La Grigna (Grigna Meridionale), above Monterone, Piz Arera (near Valcanale; Fig. 2A).

*Habitat and ecology.* On calcareous rocks and walls, 1300–2150 m.

*Typification and synonymy of Facchinia grignensis.* – All nomenclatural synonyms refer to four names: *Arenaria grineensis* E.Thomas, *Tryphane grignensis* Rchb., *Moehringia thomasiana* J.Gay and *Alsine grineensis* Gren. & Godr. The latter three names refer directly to *Arenaria grineensis* E.Thomas, a nomen nudum used by Thomas for his specimens. It is thus clear that all these names refer to the same species and should be homotypic synonyms. The first valid name is *Tryphane grignensis* Rchb. Therefore we follow Reichenbach’s (1842) spelling of the name which is congruent with the spelling of the La Grigna group after which the species was named. We choose as type one of Thomas’s specimens on which all names are based.

*Additional specimens studied.* ITALY. Bergamasker Alpen, Val Aqualina, Aufstieg vom Rif. Alpe Corte ob. Valcanale zum Piz Arera, 2120 m, 24 viii 1972, *J. Schimmitat* s.n. (M barcode 0219785; photograph specimen); auf der Grigna im Val Sassina, s.d., *s.coll.* s.n. (M barcode 0219786); Südl. Bergamasker Alpen, von Valcanale zum Piz Arera, 1500 m, 04 viii 1956,

*H. Merxmüller & W. Wiedmann* 323/56 (M barcode 0219787); Bergamasker Alpen, Grigna meridionale, Rifugio Rosalba, 1890 m, 11 viii 1952, *H. Reznik* s.n. (M barcode 0219788); Flora Lombardia, Monte Grigna, Mte. Campione, 1600 m, 07 viii 1894, *R. Beyer* s.n. (M barcode 0219789); Bergamasker Alpen, Gipfelregion der Grigna meridionale, 2050 m, 02 viii 1956, *W. Gutermann* s.n. (M barcode 0219790); Bergamasker Alpen, von Valcanale auf den Pizzo Arera, 1600 m, 04 viii 1956, *W. Gutermann* s.n. (M barcode 0219790); Südl. Bergamasker Alpen, von Valcanale zum Pizzo Arera, 1500 m, 04 viii 1956, *H. Merxmüller & W. Wiedmann* 323/56 (M barcode 0219791); Südl. Bergamasker Alpen, Grigna Massiv, von Piano di Resinelli auf die Grigna Meridionale, 1850 m, 01–02 viii 1956, *H. Merxmüller & W. Wiedmann* 296/56 (M barcode 0219792); Lombardei, Kalkfelsen östlich des Rifugio Lago Branchino, 9°48'20"E 45°57'2"N, 1794 m, 28 vii 2013, *M.S. Dillenberger* 13074 (MJG barcode 012498); Prov. Bergamo, Bergamasker Alpen, Nordhang des Pizzo Arera, 1900 m, 06 viii 1968, *D. Podlech* 15399 (MSB barcode 116979); ex vertice Campione prope Lecco, 14 viii 1863, *J. Ball* s.n. (WU barcode 0071233); Italia borealis, in saxosis calcareis montis Resegone di Lecco supra pagum Morterone, 1300 m, 14 viii 1894, *Dr. A. de Degen* s.n. (WU barcode 0071234); Rochers (calcaires) herbeux près du Sommet du monts Grigna, Alpes de Lecco, en Lombardie, 16 viii 1859, *Leresche* s.n. (Z barcode 000081047); Rochers (calcaires) herbeux près du Sommet du monts Grigna, Alpes de Lecco, en Lombardie, 16 viii 1859, *Leresche* s.n. (Z barcode 000081046); Rochers (calcaires) herbeux près du sommet du monts Grigna, Alpes de Lecco, en Lombardie, 16 viii 1859, *Leresche* s.n. (Z barcode 000081045).

This species is a narrow endemic of the Bergamo Alps with main occurrences in the La Grigna Mountains at Lake Como and around Piz Arera near Valcanale and a few isolated occurrences elsewhere in the Bergamo Alps (Fig. 2A). It can be easily recognised by its very narrow linear leaves (Fig. 1C) and the total absence of hairs. The species most similar to *Facchinia grignensis* (*F. lanceolata* and *F. valentina*) are endemics of other regions (Fig. 2).

**4. *Facchinia herniarioides* (Rion) Dillenb. & Kadereit, comb. nov.** – *Alsine herniarioides* Rion, Verh. Schweiz. Naturf. Ges. 37: 178. 1852. – *Siebera cherlerioides* var. *foliis ciliatis* Fisch.-Oost., Flora 37: 97. 1854. – *Alsine aretioides* var. *herniarioides* (Rion) Wohlf., Syn. Deut. Schweiz. Fl., ed. 3 [Hallier & Brand]: 276. 1892. – *Alsine octandra* b. *herniarioides* (Rion) Gürke, Pl. Eur. 2(2): 259. 1899. – *Minuartia herniarioides* (Rion) H.E.Hess, Landolt & Hirzel; Fl. Schweiz 3: 778. 1972. – Type: “*Alsine aretioides* M. K., am Allalein Gletscher im Wallis, July; am 29. July war ich der Erste der diese seltene Pfl. auf den Alpen der Schweiz entdeckte. Ihr Standort ist der Matmark im Saasthal im Wallis, über 8000’.”, 29 vii 1844, *Vulpius* s.n. (lecto G barcode 00380831 [photo!], designated here).

*Alsine aretioides* var. *ronii* Greml, Excursionsfl. Schweiz ed. 3: 100. 1878. – *Minuartia aretioides* var. *ronii* (Greml) Schinz & Thell, Fl. Schweiz (Schinz), ed. 3, 2: 107. 1914. – *Minuartia aretioides* subsp. *ronii* (Greml) Mattf., Repert. Spec. Nov. Regni Veg. Beih. 15: 145. 1922. – *Minuartia cherlerioides* subsp. *ronii* (Greml) Friedrich, Repert. Spec. Nov. Regni Veg. 70: 5. 1965. – Type: [Switzerland] vallée de Saas, Ofenthal, 2400 m, 20 vii 1868, *Favrat* s.n. (lecto Z barcode 000065484!, designated here; isolecto Z barcode 000065480!, ZT barcode 00035529!, ZT barcode 00013989!, G barcode 00380827 [photo!], G barcode 00380828 [photo!]).

Plants caespitose, 2–5 cm tall (Fig. 4); leaves oblong-elliptical (Fig. 1D), with 3–5 veins, often only the middle vein prominent, 1.3–2.2 mm long, 1–1.3 mm wide, ciliate. Flowers solitary, pedicels very short ( $\leq 1$  mm). Sepals 4, lanceolate, 1.8–2.4 mm long, 1–1.3 mm wide, with 3 veins, acute, glabrous; petals 4, lanceolate, slightly exceeding sepals; stamens 8, anthers white to orange; styles 3, sometimes 4 in single flowers; capsule valves 3, rarely 4, capsules 1.8–2.3 mm long.  $2n = 36$  (Çelebioğlu *et al.*, 1990).

*Distribution.* Valais (mainly Saas Valley, Monte Rosa group), Ticino, Lombardy (Ortler Group), Trentino-Alto Adige (Adamello Group; Fig. 2A).

*Habitat and ecology.* Calcifuge, in fissures of large rocks and walls, (2000–)2300–3200(–3400) m.

*Typification and synonymy of* *Facchinia herniarioides*. – The synonymy of all names of this species is clear. Gremlí (1878), who published *Alsine aretioides* var. *rionii*, listed *Alsine herniarioides* Rion as synonym and gave as locality the “Ofenthal bei Matmark” according to Favrat. We therefore choose a specimen from this locality collected by Favrat before the publication of the name. Rion (1852) and Fischer-Ooster (1854) referred to the same specimen collected by Vulpius in their description, and Fischer-Ooster (1854) furthermore cites Rion’s (1852) name *Alsine herniarioides*. The protologue of *Alsine herniarioides* states that the plant was discovered by Vulpius in the Saas Valley. In the protologue of *Siebera cherlerioides* var. *foliis ciliatis* this information is expanded by date (1844) and altitude (8000 ft). A specimen containing all this information could be found at G, and this specimen was therefore chosen as lectotype for both *Siebera cherlerioides* var. *foliis ciliatis* and *Alsine herniarioides*.

*Additional specimens studied.* ITALY. Ortler: Südhang des M. Vioz, 2800 m, 15 viii 1952, Dr. G. Wolff s.n. (M barcode 0156385); Prov. Novara, Mte. Moro bei Macugnaga, 2800–3200 m, 16 viii 1964, H. Merxmüller & W. Wiedmann 124/64 (M barcode 0156229); Aostatal, Felswand zwischen dem Lago Gabiet und dem Col d’Olen, 7°51’7”E 45°51’46”N, 2506 m, 08 ix 2012, M.S. Dillenberger & A.J. Moore 2012186 (MJG barcode 009828); Aostatal, Felswand zwischen dem Lago Gabiet und dem Col d’Olen, 7°51’4”E 45°51’48”N, 2516 m, 08 ix 2012, M.S. Dillenberger & A.J. Moore 2012186 (MJG barcode 009829); Lombardei, Passo Val Fredda am Monte Frerone, 10°24’56”E 45°56’25”N, 2345 m, 05 ix 2012, M.S. Dillenberger & A.J. Moore 2012182 (MJG barcode 009833); Lombardei, Passo Val Fredda am Monte Frerone, 10°24’55”E 45°56’25”N, 2361 m, 05 ix 2012, M.S. Dillenberger & A. J. Moore 2012182 (MJG barcode 009834); Lombardei, Passo Val Fredda am Monte Frerone, 10°24’55”E 45°56’25”N, 2361 m, 05 ix 2012, M.S. Dillenberger & A.J. Moore 2012182 (MJG barcode 009835); Lombardei, Passo Val Fredda am Monte Frerone, 10°24’55”E 45°56’25”N, 2361 m, 05 ix 2012, M.S. Dillenberger & A.J. Moore 2012182 (MJG barcode 009836); Aosta, Penninische Alpen, Val di Gressoney, Lac Gabiet – Col d’Olen, 45°51’48”N 7°51’3”E, 2300–3000 m, 23 vii 2001, G. Schneeweiß, P. Schönswetter & A. Tribsch 6541 (WU barcode 0020518); Trentino-Alto Adige: Trento, Adamello-Presanella, Umgebung des Passo del Paradiso, 2500–2700 m, 18 viii 2000, A. Tribsch 5396 (WU barcode 0071192); Lombardia, Brescia, Gardaseeberge, Umgebung des Passo di Val Fredda, 2330–2360 m, 19 viii 2000, P. Schönswetter & A. Tribsch 5398 (WU barcode 0071193); Pedemontium, Prov. di Torino, in Valle Augustana (Valle d’Aosta), in rupibus cacuminis montis Hohe-Licht (Monte Rosa), 3400 m, 10 viii 1905, L. Vaccari s.n. (WU barcode 0071195); ad rupes schistoso-micaceas in arborum termino, Mt. Tresero, 2500 m, s.d.,

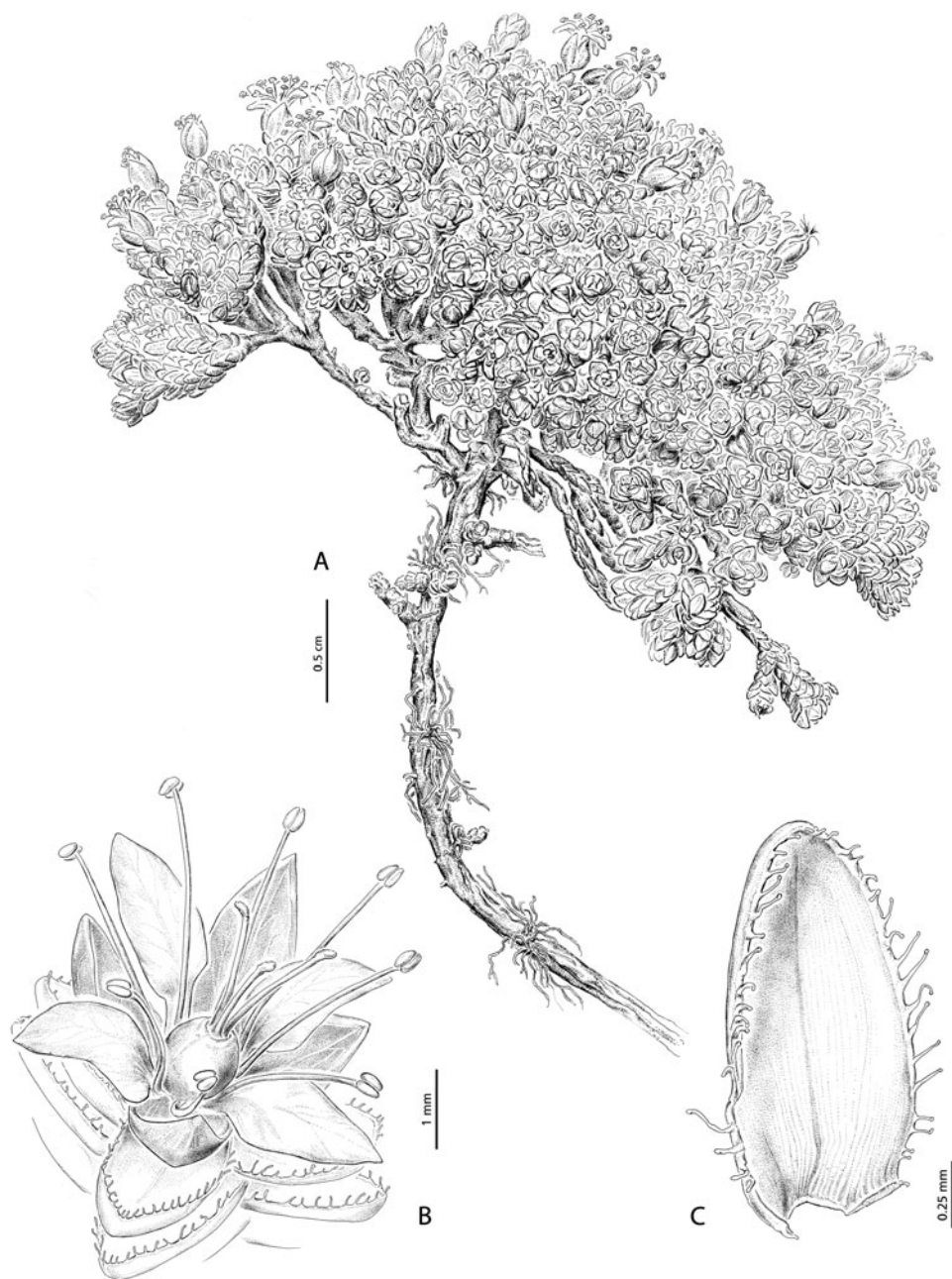


FIG. 4. *Facchinia herniarioides*. A, habit; B, flower; C, middle cauline leaf.

*M. Longa* s.n. (Z barcode 000078504); Flora de Bormio, rochers stratifiés de mica-schista entre les chalets de Tresero et le glacier, 09 viii 1884, *D. W. Cornaz* s.n. (Z barcode 0000654999); ad rupes schistoso-micaceas in arborum termino Mt. Tresero, 2500 m, 01 vii 1900, *M. Longa* s.n. (Z barcode 000065500); Pedemontium, Prov. di Torino, in Valle Augustana (Valle d'Aosta), in

rupibus cacuminis montis Hohe-Licht (Monte Rosa), 3400 m, 10 viii 1905, *A. Béguinot* & *R. Pampanini* s.n. (Z barcode 000065498); Alagna-Valsesia (Monte Rosa), 10 viii 1877, *A.-F. Negri* s.n. (Z barcode 000065497); ad rupes schistosas in pasenis editionibus alpibus Tresèro, 2500 m, 17 viii 1896, *M. Longa* s.n. (Z barcode 000065494).

SWITZERLAND. Au dessus des Distelalpen, vallée de Saas (Valais), 2400 m, 20 vii 1868, *L. Favrat* s.n. (F barcode 5255 5); Monte Rosa Alpen, viii (18)49, *S. Rehsteiner* s.n. (M barcode 0156400); Wallis, Saas Fee, von der Britanniahütte zum Hinterallalin, 2850 m, 02 ix 1984, *O. Angerer* s.n. (M barcode 0156231); Wallis, Saas, im Ofental, Gneisfelsen, 2600 m, 08 viii 1950, *H. Merxmüller* s.n. (M barcode 0156230); Ofenthal, Saas, Haut Valais, vii ?, *s.coll.* s.n. (M barcode 0156398); Wallis, Saas-Tal, Felsen hinter der Britanniahütte oberhalb von Saas-Fee, 7°56'3"E 46°3'35"N, 3042 m, 10 ix 2012, *M.S. Dillenberger* & *A.J. Moore* 2012191 (MJG barcode 011588); Wallis, Saas-Tal, Felsen hinter der Britanniahütte oberhalb von Saas-Fee, 7°56'3"E 46°3'35"N, 3042 m, 10 ix 2012, *M.S. Dillenberger* & *A.J. Moore* 2012191 (MJG barcode 011589); Wallis, Saas-Tal, Schwarzbegalp oberhalb des Mattmark-Stausees, 7°57'1"E 46°2'31"N, 2428 m, 10 ix 2012, *M.S. Dillenberger* & *A.J. Moore* 2012192 (MJG barcode 009840); Wallis, Saas-Tal, Schwarzbegalp oberhalb des Mattmark-Stausees, 7°57'0"E 46°2'30"N, 2432 m, 10 ix 2012, *M.S. Dillenberger* & *A.J. Moore* 2012192 (MJG barcode 009841); Wallis, Zermatt, Felsen am Wanderweg vom Unterrothorn zum Oberrothorn, 7°48'50"E 46°1'20"N, 3066 m, 09 ix 2012, *M.S. Dillenberger* & *A.J. Moore* 2012189 (MJG barcode 009842); Wallis, Saas-Tal, Britanniahütte oberhalb von Saas-Fee, 7°56'3"E 46°3'35"N, 3046 m, 10 ix 2012, *M.S. Dillenberger* & *A.J. Moore* 2012191 (MJG barcode 009843); Wallis, Weg vom Unterrothorn zum Oberrothorn bei Zermatt, 7°48'50"E 46°1'21"N, 3090 m, 09 ix 2012, *M.S. Dillenberger* & *A.J. Moore* 2012189 (MJG barcode 009811); Ofenthal, Saas, 6800', 20 vii, *Dom. Favrat* & *D. Lagger* s.n. (WU barcode 0071173); au dessus des Distelalpen, vallée de Saas (Valais), 2400 m, 20 vii 1868, *L. Favrat* s.n. (WU barcode 0071194); Ofenthal, 20 vii 1869, *Muret* s.n. (Z barcode 000065488); Ofenthal, Vallée de Saas, vii, *J. MT.* s.n. (Z barcode 000065487); rochers de l'Ofenthal, Mattmark, Valais, 2500 m, 31 vii 1880, *P. Chenevard* s.n. (Z barcode 000065486); Wallis, s.d., *F. v. Tarel* s.n. (Z barcode 000065485); vallée de Saas, im Ofenthal bei Mattmark, 2400 m, 20 vii 1868, *Favrat* s.n. (Z barcode 000065484); Ofenthal, vallée de Saas, Valais, 20 vii 1869, *Muret* s.n. (Z barcode 000065483); aus dem Saasthal, vii 1849, *F.O. Wolf* s.n. (Z barcode 000065482); Ofenthal, Matmark, Saas, vii 1869, *J. MT.* s.n. (Z barcode 000065481); Ofenthal (Saas, Valais), 20 vii 1868, *Favrat* s.n. (Z barcode 000065480); rochers de l'Ofenthal, au dessus de Mattmark, 2500 m, 31 vii 1880, *P. Chenevard* s.n. (Z barcode 000065479); Ofenthal, vii 1874, *F.O. Wolf* s.n. (Z barcode 000065478); Allalinhorn, près Saas (Valais), ix 177?, *F.O. Wolf* s.n. (Z barcode 000065477); Misox, Sasso della Paglia, 2400 m, viii 12, *J. Braun* s.n. (Z barcode 000065476); Misox, Sasso della Paglia, 2480 m, viii 11, *J. Braun* s.n. (Z barcode 000065475); Wallis, Crête de Barneuza, 3020 m, 16 viii 1939, *E. Schmid* s.n. (Z barcode 000065474); Wallis, Crête de Barneuza, 16 viii 1939, *E. Schmid* s.n. (Z barcode 000065473); Schwarzbegalp, VS, 25 viii 1888, *s.coll.* s.n. (Z barcode 000065472); Schwarzbegalp, VS, 25 viii 1888, *s.coll.* s.n. (Z barcode 000065471); Ofenthal, Mattmark, Valais, 18 vii 1870, *A.J. Broune* s.n. (ZT barcode 00035528); Ofenthal (Saas), 2400 m, 20 vii 1868, *Favrat* s.n. (ZT barcode 00035529); rochers à l'Ofenthal, vallée de Saas, 2600 m, 29 vii 1914, *Jaccard* s.n. (ZT barcode 00013990); Val Ofenthal (Saas), 20 vii 1868, *Favrat* s.n. (ZT barcode 00013989); Wallis, Saas Fee, Mattmark-Alpe, 2500 m, 18 vii 1951, *O. Hirschmann* s.n. (ZT barcode 00013988); Wallis, Mattmark-Alp, 2500 m, 07 vii 1950, *O. Hirschmann* s.n. (ZT barcode 00013995); fentes es rochers a la Schwarzenbergalp, vallée de Saas, 2600 m, 19 vii 1898, *H. Jaccard* s.n. (ZT barcode 00013994); Sasso della Paglia (Misox), 2500 m, 07 viii 1911, *Braun* s.n. (ZT barcode 00013993); Wallis, Höhbalm, 2650–2700 m, 20 vii 1920, *F.* s.n. (ZT barcode 00013992); Mattmark, Saastal, Wallis, 2550 m, 08 vii 1950, *W. Lüdi* s.n. (ZT barcode 00013991).

This species was formerly treated as a subspecies (subsp. *ronii*) of *Facchinia cherlerioides*. It can easily be distinguished from both subspecies of *Facchinia cherlerioides* by its ciliate leaves. *Facchinia herniarioides* is the only strictly calcifuge species of the genus.

**5. *Facchinia lanceolata*** (All.) Rchb., Icon. Fl. Germ. Helv. 5: 29. 1841. – *Arenaria lanceolata* All., Auct. Syn. 35. 1773. – *Alsine lanceolata* (All.) Mert. & W.D.J.Koch, Deutschl. Fl. ed. 3, 2: 275. 1826. – *Sabulina lanceolata* (All.) Rchb., Fl. Germ. Excurs. 2: 790. 1832. – *Minuartia lanceolata* (All.) Mattf., Bot. Jahrb. Syst. 57(Beibl. 126): 31. 1921. – Type: “*Arenaria lanceolata*, *Arenaria* fol. lanceolatis trinervis erectis glabris, radicalis congestis. Herbarium Allioni” (TO [photo!], designated by Dal Vesco in Allionia 31: 103. 1992).

*Alsine clementei* Huter, Oesterr. Bot. Z. 54: 451. 1904. – *Minuartia lanceolata* subsp. *clementei* (Huter) Mattf., Bot. Jahrb. Syst. 57(Beibl. 126): 31. 1921. – *Alsine flaccida*  $\beta$  *clementei* (Huter) Fiori, Nuov. Fl. Italia 1: 461. 1923. – *Minuartia rupestris* subsp. *clementei* (Huter) G.Halliday ex Greuter & Burdet, Willdenowia 14: 43. 1984. – Type: “*Alsine lanceolata* M. & K., Mont Viso, Dauph., *G. Clementi*” (holo STR barcode 60186 [photo!]).

Stems erect, (3.5–)5.5–10 cm, glandular-pubescent at least above; leaves lanceolate (Fig. 1E), with 3–7 veins, often only the middle vein prominent, 5–12 mm long, 0.9–1.4 mm wide, ciliate. Inflorescences with 1–5 (rarely more) flowers; pedicels 8–15 mm, longer than sepals, glandular-pubescent; sepals 5, lanceolate, 3.7–4.5 mm long, 1–1.3 mm wide, with 3–7 veins, acute, sparsely glandular-pubescent (at the base); petals 5, lanceolate, exceeding sepals (Fig. 5); stamens 10, anthers white to reddish; styles 3; capsule valves 3, capsules 4–4.6 mm long.  $2n = 36$  (Favarger, 1959).

*Distribution.* Endemic to the Southwest Alps (Fig. 2D).

*Habitat and ecology.* Fissures of calcareous rock faces, 1700–2600(–2800) m.

*Typification and synonymy of Facchinia lanceolata.* – The lectotype of *Arenaria lanceolata* All. was chosen by Dal Vesco (1992) from specimens in Allioni’s herbarium. *Alsine clementei* Huter was described on the basis of a herbarium specimen in Strasbourg. According to the protologue, the label reads: “*Alsine lanceolata* M. et K.” Monte Viso, leg. Clementi. This specimen has been located in the herbarium at Strasbourg.

*Additional specimens studied.* FRANCE. Hautes-Alpes, Queyras, vom Lac Foréant zur Brèche de ruines, 2618–2922 m, 09 viii 1955, *H. Merxmüller & W. Wiedmann* 1245/55 (M barcode 0219780); PACA, Hautes-Alpes, Tal bei Ristolas, 6°59'31"E 44°45'6"N, 1794 m, 05 vii 2012, *M.S. Dillenberg* 201255 (MJG barcode 009880); PACA, Hautes-Alpes, Tal bei Ristolas, 6°59'29"E 44°45'10"N, 1758 m, 05 vii 2012, *M.S. Dillenberg* 201253 (MJG barcode 009854); PACA, Hautes-Alpes, Tal bei Ristolas, 6°59'27"E 44°45'15"N, 1728 m, 05 vii 2012, *M.S. Dillenberg* 201248 (MJG barcode 009855); PACA, Hautes-Alpes, Tal bei Ristolas, 6°59'29"E 44°45'14"N, 1721 m, 05 vii 2012, *M.S. Dillenberg* 201256 (MJG barcode 009881);

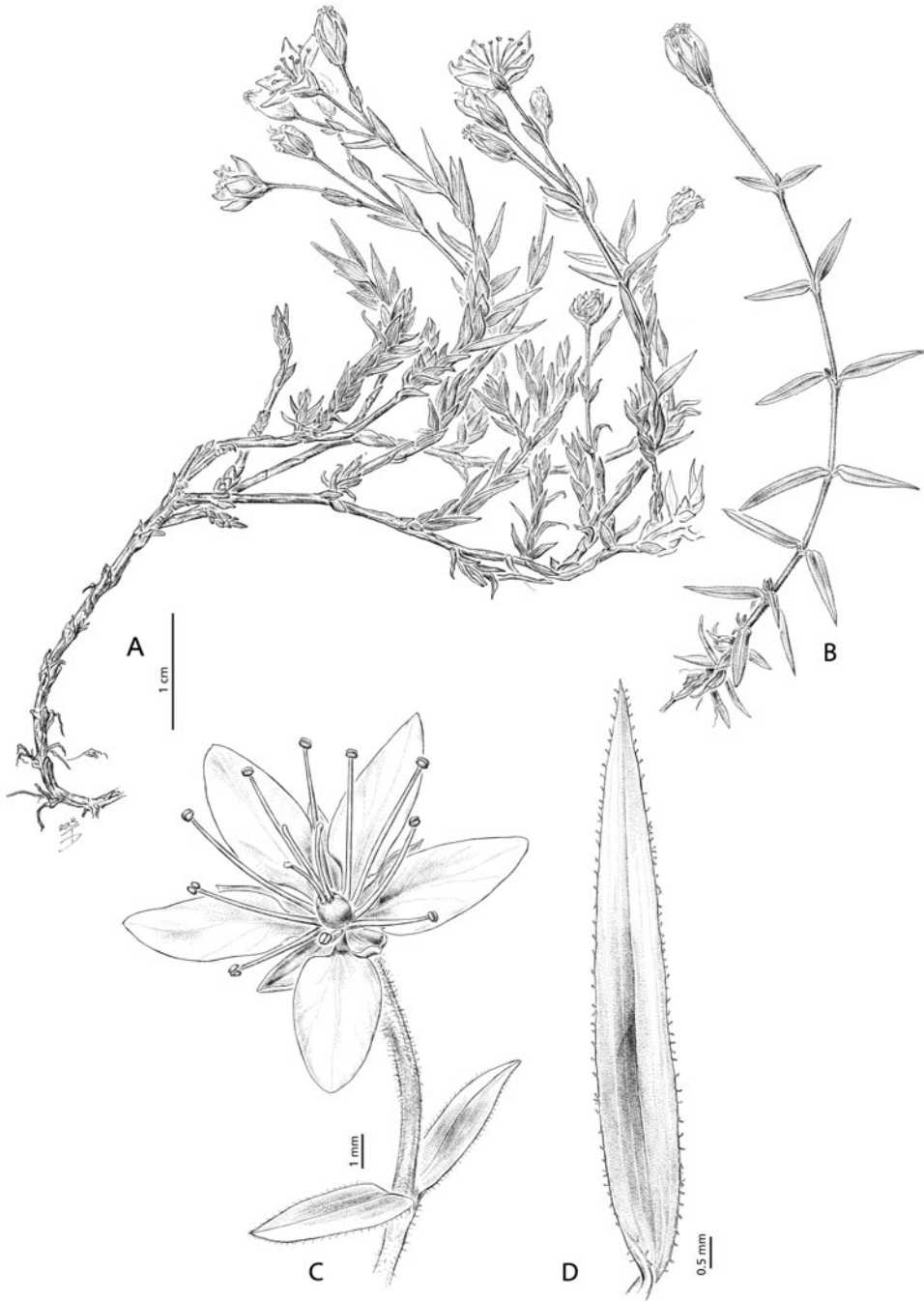


FIG. 5. *Facchinia lanceolata*. A, habit; B, single stem; C, flower; D, middle cauline leaf.

PACA, steile Kalkfelsen am Wegrand bei Ristolas, 6°59'57"E 44°43'57"N, 1928 m, 17 vii 2013, *M.S. Dillenberger* 13056 (MJG barcode 012497); PACA, steile Kalkfelsen am Wegrand bei Ristolas, 6°59'55"E 44°43'56"N, 1930 m, 17 vii 2013, *M.S. Dillenberger* 13056a (MJG barcode 012496); Camp des Fourches N ober Bousiéyas (Département Alpes-Maritimes), UTM 32T LQ 31, 2240–2320 m, 10 vii 1998, *W. Gutermann et al.* 32762 (WU barcode 0071256); Alpes-Maritimes, Haute Vallée de la Tinée, au Col de Pal, 2200 m, 18 viii 1936, *M. Guinochet* s.n. (Z barcode 000081090); Felsritze, 7°37'36"E 44°09'27"N, NNE Col de la Perle, Valmaurina, Vallée de la Roya, Dép. Alpes-Maritimes, 2120 m, 10 vii 2002, *J. Röthlisberger* s.n. (Z barcode 000081088); s.loc., vii 1890, *s.coll.* s.n. (Z barcode 000081066); Col de Gipes, Alpes Maritimes, 2400 m, vii 1887, *Favrat* s.n. (Z barcode 000081058); sur les freaun/r près la Grave, 02 viii 1869, *E. Reverchon* s.n. (Z barcode 000081057); Col de Gipes, Alpes Maritimes, 2400 m, 21 vii 1887, *Favrat* s.n. (Z barcode 000081056); Tête de Veyrasse, 2400 m, vi/vii 1930, *Braun-Blanquet* s.n. (Z barcode 000081055); Basses-Alpes, Vallon de Laverq, au-dessus de Méolans, 1700 m, 06 vii 1927, *Thiébaud* s.n. (Z barcode 000081054); Vallée de la Lombarde près Bessans., 14 ix 1??9, *A. Chabem* s.n. (Z barcode 000081053); Col Lacroix, près Abriès-en-Queyras (Hautes-Alpes), 2350 m, 17 viii 1875, *P. Faure* s.n. (Z barcode 000081052); Pentes du Mont Meuniers, au-dessus de Vignols, Alpes maritimes, 03 viii 1876, *Burnat & Vetter* s.n. (Z barcode 000081051); Estenc, Roche Grande, Alpes Maritimes, 14 vi 1875, *Reverchon* s.n. (Z barcode 000081050); Col de Gipes, Alpes Maritimes, vii 1887, *Favrat* s.n. (Z barcode 000081049).

ITALY. Piemonte, valle di Soana, von Piamprato am Rio del Becco aufwärts, an einem Einzelfelsen unterhalb Gr. Ciavanassa, 1830 m, 25 vii 1994, *O. Angerer* s.n. (M barcode 0219774); Prov. Torino, vom Col de Finestre über den Col de Lauson nach Sestriere, 2200–2600 m, 19 viii 1964, *H. Merxmüller & W. Wiedmann* 178/64 (M barcode 0219775); Prov. Torino, von Piamprato gegen die Cima Larissa, 1600–2300 m, 18 viii 1964, *H. Merxmüller & W. Wiedmann* 159/64 (M barcode 0219776); Prov. Torino, von Piamprato gegen die Cima Larissa, 1600–2300 m, 18 viii 1964, *H. Merxmüller & W. Wiedmann* 160/64 (M barcode 0219777); Cottische Alpen, Sestriere, Grat des Monte Sises, 2650 m, 05 viii 1951, *H. Merxmüller & W. Wiedmann* s.n. (M barcode 0219778); Cottische Alpen, Val Soano, von Piamprato zum Col d'Larissa, 1820 m, 24 vii 1975, *J. Schimmitat* s.n. (M barcode 0219779; photograph specimen); Piemont, Alpes (Vallée de Vin), s.d., *Thomas* s.n. (M barcode 0219720); Monte Orsiera NE Fenestella (Prov. Torino), UTM 32T LQ 5191, 2600–2800 m, 17 vii 1998, *W. Gutermann et al.* 33283 (WU barcode 0071255); in alpinis Tendae (= Colle di Tenda), s.d., *s.coll.* s.n. (Z barcode 000081062). s.loc., s.d., *s.coll.* s.n. (M barcode 0219773).

*Facchinia lanceolata* has usually been treated as a synonym of *F. rupestris* (e.g. Schinz & Thellung, 1907; McNeill, 1962). We restrict *Facchinia lanceolata* to material from the Southwest Alps which has been known as *Minuartia rupestris* subsp. *clementei*. *Facchinia lanceolata* differs from *F. rupestris* in having erect stems that are up to 10 cm tall (vs. usually 1–3 cm in *F. rupestris*), longer leaves (5–12 vs. 2.1–4.7 mm) and inflorescences with often two or more flowers (vs. usually single flowers). In the Southwest Alps, where the distribution of the two species overlaps, the distinction of small individuals of *Facchinia lanceolata* from large individuals of *F. rupestris* can be difficult, and will be further discussed below. However, our molecular results (Dillenberger & Kadereit, 2014), which included accessions of both species from the Southwest Alps, support the separation of *Facchinia lanceolata* from *F. rupestris*.

**6. *Facchinia rupestris* (Scop.) Dillenb. & Kadereit, comb. nov.** – *Stellaria rupestris* Scop., Fl. Carniol., ed. 2. 1: 317, t. 18. f. 1. 1771, non *Alsine rupestris* Fenzl, 1833.



- *Sabulina lanceolata*  $\gamma$  *rupestris* (Scop.) Rchb., Fl. Germ. Excurs. 2: 790. 1832.  
 – *Minuartia rupestris* (Scop.) Schinz & Thell., Bull. Herb. Boissier II, 7: 403. 1907.  
 – *Minuartia lanceolata* subsp. *rupestris* (Scop.) Mattf., Bot. Jahrb. Syst. 57(Beibl. 126): 31. 1921. – *Somerauera rupestris* (Scop.) Á.Löve & D.Löve, Preslia 46: 127. 1974. – Type: Tab. 18, illustration “540. *Stellaria Rupestris.*”, Fl. Carniol., ed. 2. 1. 1771 (lecto designated here); Flora exsiccata Carniolica no. 1126, “In ditione Goritiensi. In rupestribus et rupium fissuris montis Rdeči Rob supra oppidulum Tolmin (Tolmein) in Alpihus Julicis; s. schistoso”, 1900 m, s.d., *Paulin* s.n. (epi LJU barcode 10037691 [photo!], designated here).
- Arenaria cherlerioides* Vill., Prosp. Hist. Pl. Dauphiné 48. 1779. – *Arenaria lanceolata*  $\beta$  *cherlerioides* (Vill.) DC., Fl. Franc. (DC. & Lamarck), ed. 3, 5(= 4.2): 785. 1805.  
 – *Arenaria lanceolata*  $\beta$  *prismatica* Gaud., Fl. Helv. 3: 193. 1828. – *Sabulina lanceolata*  $\alpha$  *cherlerioides* (Vill.) Rchb., Fl. Germ. Excurs. 2: 790. 1832. – *Alsine lanceolata*  $\beta$  *condensata* Koch, Syn. Fl. Germ. Helv. ed. 1: 112. 1835. – *Alsine rupestris* var. *cherlerioides* (Vill.) Dalla Torre, Anleit. Beob. Alpenpfl. 190. 1882. – Type: “*Arenaria cherlerioides* Vill., Digne et Orcières dans le Champsaur” (lecto GRM-VILLARS barcode MHNGR.1837.27943, upper left corner, attached to the label [photo!; see Fig. 6], designated here).
- Arenaria brevicaulis* Sternb., Pl. Min. Cogn. Pug. 1: 31. 1813. – Type: “*Arenaria brevicaulis* mihi [...] Im Thal Breguz (Breguzzo) in Süd-Tyrol”, 1804, *Sternberg* s.n. (lecto PR barcode 821114 [photo!], designated here).
- Sabulina lanceolata*  $\beta$  *usneoides* Rchb., Fl. Germ. Excurs. 2: 790. 1832. – *Alsine rupestris* c. *usneoides* (Rchb.) K.Richt. ex Gürke, Pl. Eur. 2(2): 259. 1899. – *Minuartia rupestris* f. *usneoides* (Rchb.) Schinz & Thell., Fl. Schweiz (Schinz), ed. 3(2): 107. 1914.
- Arenaria flaccida* Froel. ex Rchb., Fl. Germ. Excurs. 2: 790. 1832, non All. 1773, nec Clairv. 1811, nec Roxb. 1814, nec Schleich. 1815.
- Alsine lanceolata*  $\alpha$  *laxa* Koch, Syn. Fl. Germ. Helv. ed. 1: 112. 1835.

Plants laxly caespitose, usually 1–3 cm tall; stems glandular-pubescent in upper part; leaves lanceolate (Fig. 1F), with 3–5 veins, often only the middle vein prominent, 2.1–4.7 mm long, 1–1.6 mm wide, ciliate. Flowers solitary in plants from the Central Alps, solitary or in pairs in plants from the Southwest Alps. Pedicels 1.3–5 mm, glandular-pubescent. Sepals 5, lanceolate, 1.1–4.2 mm long, 1–1.3 mm wide, with 3–5 veins, acute, usually glandular-pubescent; petals 5, lanceolate, exceeding sepals by c.2 mm; stamens 10, anthers yellowish; styles 3; capsule valves 3, capsules 1.6–4.3 mm long.  $2n = 72$  (Favarger, 1962).

*Distribution.* Central and Southwest Alps (Fig. 2D).

*Habitat and ecology.* Mainly on calcareous rocks and scree, in Slovenia (Wraber, 1986) and rarely in other localities on non-calcareous rocks, (1700–)2000–2700 m.

*Typification and synonymy of Facchinia rupestris.* – It was not possible to find original material of *Facchinia rupestris*. According to Stafleu & Cowan (1985), Scopoli’s types



were distributed to various herbaria, among them LINN, C, M, UPS, B, MPU, PAV and P-HAL. All these herbaria except PAV checked their collections and found no potential type material. Scopoli's collections at PAV were probably completely destroyed during the Second World War (Stafleu & Cowan, 1985). The only potential type of *Stellaria rupestris* then is the illustration provided by Scopoli (1771: Tab. 18, no. 540), which we choose as lectotype. This illustration shows some characters (e.g. one tetramerous and one pentamerous flower, an inflorescence with five flowers, leaves of more linear than lanceolate shape) which do not fit well with what is commonly called *Minuartia rupestris*. However, these characters also do not allow us to identify this illustration as another species. To make it unambiguous to which species the name *Stellaria rupestris* refers, we here designate an epitype. For this, we choose a specimen from the *Flora exsiccata Carniolica*. Although specimens of this collection with collection numbers greater than 1000 were not very widely distributed (J. Jogan, LJU, pers. comm.), isoeotypes may exist. The synonymy of *Alsine lanceolata*  $\alpha$  *laxa* with *Facchinia rupestris* is clear because Koch (1835) gives *Stellaria rupestris* and *Arenaria lanceolata* as synonyms. In combination with the region covered of Koch's *Synopsis florum Germanicae et Helveticae* (Koch, 1835), it is clear that *Alsine lanceolata*  $\alpha$  *laxa* is a synonym of *Facchinia rupestris* and not of *F. lanceolata*. Since *Facchinia rupestris* and *F. lanceolata* were considered one species at that time, Koch (1835) was correct to list both names as synonyms.

We choose as type of *Arenaria cherlerioides* Vill. one of the sheets in Villars' herbarium at GRM. Since this is a mixed sheet of *Facchinia rupestris* and *F. lanceolata*, we choose the specimen in the upper left corner that is attached to the cited label. A photograph of the specimen is given in Fig. 6 and the type is indicated. The same specimen is chosen as type of *Arenaria lanceolata*  $\beta$  *prismatica* Gaud. and *Alsine lanceolata*  $\beta$  *condensata* Koch, because in both cases *Ar. cherlerioides* Vill. was given as synonym in the descriptions.

In the case of *Arenaria brevicaulis* Sternb., a specimen was located among von Sternberg's specimens at PR that fits the information in his description of the species. We therefore choose this specimen as type of *Arenaria brevicaulis*.

*Arenaria flaccida* Froel. was validated by Reichenbach (1832) by citing it as synonym of *Sabulina lanceolata*  $\beta$  *usneoides* Rehb. in the description. Therefore both names should be homotypic. Reichenbach (1832) gives the information that Frölich collected the plants in the Val Duron (Duronthale) in the Dolomites on 07 August 1829. It was not possible to find a specimen of Frölich's with this date and from this locality. It may have been destroyed by the Zwinger fire in 1849 (Stafleu & Cowan, 1983) with other Reichenbach specimens, or in the Second World War with other specimens of Frölich's at B (Stafleu & Cowan, 1976). An alternative would be to



FIG. 6. Lectotype of *Arenaria cherlerioides* Vill., *Arenaria lanceolata*  $\beta$  *prismatica* Gaud., and *Alsine lanceolata*  $\beta$  *condensata* Koch. Coll. Museum d'Histoire Naturelle de Grenoble; specimen *Arenaria cherlerioides* Vill. (GRM-VILLARS no. MHNGr.1837.27943).

choose a specimen from Reichenbach's *Flora Germanica* exsiccata as type of *Arenaria flaccida* and *Sabulina lanceolata*  $\beta$  *usneoides*, since they were published in the *Flora Germanica excursoria* (Reichenbach, 1832). However, we did not search for a specimen in this collection. The synonymy of *Arenaria flaccida* and *Sabulina lanceolata*  $\beta$  *usneoides* with *Facchinia rupestris* has never been in doubt, and in the first description *Sabulina lanceolata*  $\beta$  *usneoides* was a variety of the present species. We therefore accept these two names as synonyms of *Facchinia rupestris*.

*Additional specimens studied.* AUSTRIA. Südgrat des Kraxentrager (Brenner), 2600 m, viii 1896, Arnold s.n. (M barcode 0219746); Radstädter Tauern, Gamsleithen, 2300 m, 14 viii 1903, O. Renner s.n. (M barcode 0219748); Tirol, Südhänge der Saxalpenwand, Zillertaler Alpen, 03 viii 1941, E. Hepp s.n. (M barcode 0219749); Kaiserjoch, Lechthal, 2400 m, 26 vii 1893, Arnold s.n. (M barcode 0219750); Tirol, Saxalwand in den Zillertaler Alpe, 03 viii 1941, E. Hepp s.n. (M barcode 0219751); Allgäuer Alpen, Rothornspitze, MTB 8728/1, 17 ix 1978, E. Dörr s.n. (M barcode 0219752); Tirol, Allgäuer Alpen, Jöchelspitze, MTB 8728/1, 2100 m, 25 ix 1982, E. Dörr s.n. (M barcode 0219753); Tirol, Tuxer Voralpen, Hänge E des Juns-Joches oberhalb Lizum im Wattental, 2480 m, 05 viii 1951, M. Steiner s.n. (MSB barcode 117329); Tirolis, Virgen, in Monte Bergerkogel, 8000', 31 vii 1867, Gandas s.n. (WU barcode 0071284); Carinthiae, s.d., Facchini s.n. (WU barcode 0071283); Kärnten, Kreuzeck-Gruppe, S-Flanke des Torkofels W des Gursgentörls, 2420 m, 07 vii 2000, P. Schönswetter & A. Tribsch 5288 (WU barcode 0071258); Salzburg, Radstädter Tauern, Gamsleitenspitze, 2000–2200 m, 22 viii 1999, P. Schönswetter & A. Tribsch 3035 (WU barcode 0071257); Tirolia orient. Kals, in ascensu mtis Muntanitz, 2600–2700 m, 27 viii 1903, H. Frh. v. Handel-Mazzetti s.n. (WU barcode 0071253); West-Tirol, Pelinkopf im Fimbartal, 2400–2850 m, 24 vii 1911, Handel-Mazzetti s.n. (WU barcode 0071252); Nord-Tirol, In Felsritzen (südlich exponiert) am Grat der Giskarspitzen im Wattenthal, 2650 m, 19 viii 1902, H. Frh. v. Handel-Mazzetti s.n. (WU barcode 0071251); Nord-Tirol, In Felsritzen am Südgrat der Klammerspitze (Tarnthaler Köpfe), 2500 m, 20 viii 1902, H. Frh. v. Handel-Mazzetti s.n. (WU barcode 0071246); Radstädter Tauern, Mittereck-Kette, Felsen der Mittereckspitze gegen Lautschfeld, viii 1916, F. Vierhapper s.n. (WU barcode 0071245); Carinthia Inter Franz-Josefs-Höhe et Hofmannhütte prope Heiligenblut, 2400 m, 30 viii 1903, H. Frh. v. Handel-Mazzetti s.n. (WU barcode 0071244); Salzburg, auf Felsen des Gamskarkogels, s.d., Pichler s.n. (WU barcode 0071243); Gamkarkogel, 7700', 09 vii 1856, coll. illegible s.n. (WU barcode 0071242); Kärnten, Karnische Alpen, Sattel zwischen Eiferspitz und Lauckeck, 2050 m, 17 ix 1998, G.M. Schneeweiß 2545 (WU barcode 0071241); Kärnten, Lienzer Dolomiten, Riebenkofel, E-Grat, 2300 m, 11 ix 1998, G.M. Schneeweiß 2532 (WU barcode 0071240); Hohe Tauern, Glocknergruppe, zwischen Hofmannshütte und Franz Josefshöhe, Bratschen, 19 vii 1957, Ehrendorfer s.n. (WU barcode 0071239); Kärnten, Bezirk Spittal an der Drau, Innerfragant, Grat zwischen Ochsentrieb und Melenwandkopf, 13°0'19"E 46°58'23"N, 2530 m, 16 vii 2010, C. Gilli & A. Berger s.n. (WU barcode 0067177); Tirol, Samnaungruppe, Fimbatal, N-Grat des Piz Val Gronda, 10°17'20"E 46°56'0"N, 2620–2800 m, 28 viii 2008, B. Frajmann & P. Schönswetter 12332 (WU barcode 0071254); Großglockner, s.d., Koll s.n. (Z barcode 000081059); Tirolia austro-orientalis, Pustaria, ad rupes in monte Glanzerkögele supra Windisch-Matrei, 2000–2150 m, s.d., Ausserdorfer s.n. (Z barcode 000065493).

FRANCE. Département des Alpes-Maritimes, Col des Champs, 49.07N 4.86E, 1900 m, 07 vii 1984, G. Müller 00394 (M barcode 0219738); Alpes Maritimes, Col de Tende, Col de la Boarie, 20 vii 1987, E. Dorn 297 (M barcode 0219739); Alpes de Provence, Hoat-Pelo, s.d., Jordan s.n. (M barcode 0156321); Allos (basses alpes), viii 1840, E. Cosson s.n. (M barcode 0156322).

GERMANY. Bayern, Oberstdorf, Gemarkung Oberstdorf, Allgäuer Alpen, Höfats-Südsüdostgrat, MTB 8628/1, 2000 m, 23 vi 2003, M. Wecker [03/1]21 (M barcode 0219771); Bayern, Schwaben, Sonthofen, Allgäuer Alpen, Südwestgrat an den Gemswänden des

Linkerskopfes, 2350 m, 08 viii 1916, *F. Vollmann* s.n. (M barcode 0219772); Bayern, Allgäuer Alpen, Kratzer, MTB 8627/4, 07 viii 1976, *E. Dörr* s.n. (M barcode 0219755); Bayern, Allgäuer Alpen, Linkerkopf-Westgrat, MTB 8727/2, 15 viii 1982, *E. Dörr* s.n. (M barcode 0219757); Bayern, Kratzer, Westgrat, MTB 8627/4, 27 vii 1990, *E. Dörr* s.n. (M barcode 0219758); Bayern, Nördliche Kalkalpen, Allgäu, Grat zwischen Rappenköpfe und Hochrappenkopf, MTB 8727/1, 16 viii 1991, *E. Dörr* s.n. (M barcode 0219759); Bayern, Berchtegadener Alpen, Watzmanngruppe, bei P. 1997 nördlich der Hirschwiese, MTB 8443/4, 1996 m, 15 vii 2005, *M. Wecker* [05/7] (M barcode 0219760); Bayern, Berchtegadener Alpen, Neuhütter Südhang, MTB 8544/1, 2039 m, 21 vii 2006, *A. Buchholz* K74 (M barcode 0219761); Bayern, Allgäuer Alpen, Höfats "Rotes Loch", Fuß der Südwand der Kleinen Höfats, MTB 8628/1, 16 vii 2003, *A. Mayer* [03/1]06 (M barcode 0219762); Bayern, Schwaben, Sonthofen, Allgäuer Alpen, Grat zwischen Großem und Kleinem Rappenkopf, 2230 m, 18 vii 1906, *F. Vollmann* s.n. (M barcode 0219763); zwischen dem großen und kleinen Rappenkopf im Allgäu, 6900', 13 viii 1857, *Holler* s.n. (M barcode 0219764); Bayern, Allgäuer Alpen, Linkerkopf, am Aufstieg vom Rappensee, 2250 m, 15 vii 1947, *H. Merxmüller* s.n. (M barcode 0219765); Bayern, Allgäuer Alpen, Linkerkopf, 2250 m, 15 vii 1947, *H. Zöttl* s.n. (M barcode 0219766); Bayern, Schwaben, Sonthofen, Allgäuer Alpen, Einsattelung zwischen großem und kleinem Rappenkopf, 6900', 13 viii 1857, *Holler* s.n. (M barcode 0219768); Felsschrot am Grat Rappenköpfe-Hochrappenkopf (Allgäu), 2230 m, ix 1919, *W. Troll* s.n. (M barcode 0219769); Bayern, Schwaben, Sonthofen, Allgäuer Alpen, Südwestgrat des Linkerskopfes, 2300 m, 18 vii 1906, *F. Vollmann* s.n. (M barcode 0219770); Rappenköpfe-Hochrappenkopf (Allgäu), 2230 m, ix 1919, *W. Troll* D5582 (MJG); Bayern, Allgäuer Alpen, Höfats ("rotes Loch"), MTB 8628/1, 1750 m, 30 vii 1988, *E. Dörr* s.n. (M barcode 0219756).

ITALY. Tirolia central, ad montem Hühnerspiel, 2500 m, viii 1892, *Huter* s.n. (M barcode 0219754); Tirolia central in rupium fissuris ad Mtem Hühnerspiel supr. Gofensaß, 2400–2600 m, viii 1885, *Huter* s.n. (Z barcode 000081071); Ligurische Alpen, Monesi – Colle di Tenda, 2150 m, 03 viii 1984, *O. Angerer* s.n. (M barcode 0219732); N. See-Alpen, Oberes Sturatal, Colle della Maddalena, Col Roburent, 2000 m, 29 vii 1951, *H. Merxmüller & W. Wiedmann* s.n. (M barcode 0219736); Bozen, Schlernhäuser (Völs am Schlern), Westliche Dolomiten, Tiers, Schlerngebiet, MTB 9535/2, 2300 m, 08 vii 2007, *G. Aichner* s.n. (BOZ barcode 18063); Bozen, Tierser-Alpl-Hütte (Tiers), Dolomiten, Tiersertal, 11°37'55"E 46°29'53"N, 2520 m, 01 vii 2008, *T. Wilhalm, G. Aichner & W. Tratter* s.n. (BOZ barcode 12624); Bozen, Seefeldscharte (Mühlbach), S-Hänge des W-Ausläufers (gegen Tschiffernaunalm) des Wieser Kragen, 11°38'40"E 46°52'58"N, 2420 m, 18 viii 2004, *T. Wilhalm* s.n. (BOZ barcode 9770); Bozen, Zufallhütte (Martell), Hintermartell, N Eingang Butztal, MTB 9529/2, 2540 m, 13 viii 2002, *T. Wilhalm* s.n. (BOZ barcode 6998); Bozen, Mutspitz (Martell), Hintermartell, Steig 150, MTB 9529/2, 2520 m, 26 vi 2000, *E. Schneider-Fürchau* s.n. (BOZ barcode 5470); Bozen, Sengesjöchl (Freienfeld), Sengestal, Maierl-Scharte, MTB 9135/1, 2500 m, 05 viii 2000, *A. Hilpold* s.n. (BOZ barcode 5459); Bozen, Lech de Lagacio (Abtei), Dolomiten, Amentarola, Fanes-Gebiet, am Steig zwischen Lech de Lagacio und Forcela di Lech, 12°0'25"E 46°33'11"N, 2260 m, 13 vii 2012, *T. Wilhalm, floristischer Arbeitskreis* s.n. (BOZ barcode 20763); Trento, steep slopes 1.2 km ESE Passo Rolle, 11°48'1"E 46°17'34"N, 2000–2100 m, 04 vii 2011, *A. Hilpold* AH20114161 (BOZ barcode 21942); Buchenstein, Südtirol, 19 vii 1843, *coll. illegible* s.n. (M barcode 0219719); Ostfuß des Sass Bece südl. Pordoi-Joch, 2300 m, 20 vii 1969, *Südalpen-Exkursion* s.n. (M barcode 0219721); Bergamasker Alpen, Weg vom Rifugio Cura zum Lago Barbellino, nach Gletscherbach, 23 vii 1972, *O. Angerer* s.n. (M barcode 0219722); Rochers, De Schilpario par Val di Vo au M. del Vena, Alpes Bergamasques (Val di Scalve), 1800–2580 m, 31 vii 1911, *Wilczek* s.n. (M barcode 0219723); Seyseralpe, vii 1823, *s.coll.* s.n. (M barcode 0219724); Südtirol, Dolomiten, Schlerngebiet, 25 ? 1895, *K.F. Arnold* s.n. (M barcode 0219725); Parreveggi, Felsköpfe östl. v. Rollepäss, 18 vii 1888, *Arnold* s.n. (M barcode 0219726); an Felswänden des Schlern in Südtirol, 8000', viii 1850, *Vulpus* s.n. (M barcode 0219727); Südtirol,

Rosengartengebiet, viii (19)04, *O. Renner* s.n. (M barcode 0219728); Tirol, Felsritzen an Kentten in Rein, 06 viii 1884, *G. Treffer* s.n. (M barcode 0219729); Tirol, Felsritzen an Kentten in Rein, 2400–2700 m, 19 viii 1900, *G. Treffer* s.n. (M barcode 0219730); Südtirol, Bretterspitze, 8000–9000', 30 viii 1855, *Molenir?* s.n. (M barcode 0219731); Südtirol, Brenner-Alpen, Hühnerspiel (Amtorspitze) bei Gossensaß, zwischen Gipfel- und Mittelstation der Seilbahn, 2200 m, 20 viii 1967, *W. Lippert* 6314 (M barcode 0219733); Nördl. Bergamasker Alpen, von Gerola Alta zum Pizzo dei Tre Signori, 1800–2550 m, 31 vii 1956, *H. Merxmüller & W. Wiedmann* 273/56 (M barcode 0219734); Südtirol, Steilhang a, Südabfall des Schlernmassivs gegen das Plötschental, 2250 m, 22 vii 1951, *H. Roessler* 609 (M barcode 0219735); Veltiner Alpen, à la Casana, vii, *And?er* s.n. (M barcode 0219741); Wildseespitze in Pfischthal, s.d., *Kerner* s.n. (M barcode 0219745); Tirol, Virgen m monte Bergerkogel, 8000', 31 vii 1867, *Gandas* s.n. (M barcode 0219747); Lombardei, Passo Val Fredda am Monte Frerone, 10°24'55"E 45°56'24"N, 2337 m, 05 ix 2012, *M.S. Dillenberger & A.J. Moore* 2012183 (MJG barcode 009830); Lombardei, Passo Val Fredda am Monte Frerone, 10°24'55"E 45°56'24"N, 2337 m, 05 ix 2012, *M.S. Dillenberger & A.J. Moore* 2012183 (MJG barcode 009831); Lombardei, Passo Val Fredda am Monte Frerone, 10°24'55"E 45°56'24"N, 2337 m, 05 ix 2012, *M.S. Dillenberger & A.J. Moore* 2012183 (MJG barcode 009832); Tirol, Schlern, s.d., *Kerner* s.n. (WU barcode 0071286); Tirol, Wildseespitze im Pfischthal, 1873, *Kerner* s.n. (WU barcode 0071285); Tirol, am Hühnerspiel bei Gossensaß, viii 1868, *Kerner* s.n. (WU barcode 0071282); Südtirol, Felsen nördl. am Rabbijoch zwischen Ulten und Nonsberg, 2650 m, 02 ix 1902, *H. Frh. v. Handel-Mazzetti* s.n. (WU barcode 0071280); Südtirol, an der Südseite der östl. Stelle delle Sute zw. Fleimstal und Valsugana einschneidenden Scharte, 2500 m, 25 viii 1906, *H. Frh. v. Handel-Mazzetti* s.n. (WU barcode 0071279); Südtirol, Südseite der Langkofelgruppe zwischen Sella und Fassajoch, 2200 m, 11 vii 1902, *H. Frh. v. Handel-Mazzetti* s.n. (WU barcode 0071278); Tirolia austr., Sasso di Rocca bei Alba (Fassa), Westgrat, 2450 m, 21 viii 1903, *H. Frh. v. Handel-Mazzetti* s.n. (WU barcode 0071277); Tirolia austro-orientalis, Pustaria, ad rupes in monte Glanzerkögele supra Windisch-Matrei, 2000–2150 m, s.d., *Ausserdorfer* s.n. (WU barcode 0071275); Tirolia austro-orientalis, Pustaria, ad rupes in monte Glanzerkögele supra Windisch-Matrei, 2000–2150 m, 20 vii 1883, *Ausserdorfer* s.n. (WU barcode 0071274); Sully cima del Geiogo di Bormio, S. Abate, 1853, *L. Viehweider di Bolgiane* s.n. (WU barcode 0071273); Tirol, Finsterstern bei Sterzing, 04 viii 1894, *R. v. Wettstein* s.n. (WU barcode 0071271); Tirol, Finsterstern bei Sterzing, 04 viii 1894, *R. v. Wettstein* s.n. (WU barcode 0071272); Schlern, s.d., *Glanz?* s.n. (WU barcode 0071270); Schlern, s.d., *F. Roth* s.n. (WU barcode 0071269); Monti di Toregno in Val?ugana, s.d., *F. Ambroz* s.n. (WU barcode 0071268); Tirol, Pusterthal, Sexten, 16 viii 1878, *Huter* s.n. (WU barcode 0071267); Sotto al Cimon della Pala S. Martino di Castrogga, 30 vii 1885, *M. de Sardagna* s.n. (WU barcode 0071265); Cima "Terra rossa", 23 vii 1880, *Sardagna* s.n. (WU barcode 0071265); Cima "Terra rossa", Bondme, 23 vii 1880, *M. de Sardagna* s.n. (WU barcode 0071264); Sommita della cima "Terra rossa" Bondme, 23 vii 1880, *M. de Sardagna* s.n. (WU barcode 0071263); Shiacciai di V. Senna, 11/12 viii 1879, *M. de Sardagna* s.n. (WU barcode 0071262); Südtirol, Zillertaler Alpen, Tristenkamm 1 km SSE des Lappacher Jöchls, 2.2 km ENE Lappach, 2450–2480 m, 06 viii 1993, *A. Tribsch* 1030 (WU barcode 0071261); Südtirol, Zillertaler Alpen, E-Grat der Ochsenalm-Spitze, 2650–2700 m, 02 viii 1994, *A. Tribsch* 873 (WU barcode 0071260); Lombardia, Sondrio, Bergamasker Alpen, (Val d'Arigna: I Forni) – Bivacco Corti – Bivacco Resnati, 1900–2500 m, 16 viii 2000, *P. Schönswetter & A. Tribsch* 5383 (WU barcode 0071259); Seiseralpe, 1823, *Dr. Zuccarini* s.n. (WU barcode 0071250); Tirol, Felsritzen an Kentten in Rein, 2400–2600 m, 27 vii 1885, *G. Treffer* s.n. (WU barcode 0071249); Alpen in Fassa, 1842, *Facchini* s.n. (WU barcode 0071248); Tirol, in "Dorfalpe" vallis Praegraten Pustariae, 7000', 07 viii 1871, *Ausserdorfer & Breidler* s.n. (WU barcode 0071247); Flora von Bormio, 2700 m, 10 viii 1911, *E. Furrer* s.n. (Z barcode 000081092); Flora von Bormio, 2600 m, 14 viii 1911, *E. Furrer* s.n. (Z barcode 000081091);

Schlerngebiet, Südtirol Dolomiten, SE-Seite der Rosszähne, 2450 m, 09 viii 1961, *W. Greuter* S3948 (Z barcode 000081089); Schlern, s.d., *Leybon* s.n. (Z barcode 000081070); Schlern, Tyrol, s.d., *s.coll.* s.n. (Z barcode 000081069); passa di Marbegno (Piemont), s.d., *Thomas* s.n. (Z barcode 000081067); Bormio, rochers élevés sur la rive droite du Valle dei Vitelli, 13 viii 1884, *D. W. Cornaz* s.n. (Z barcode 000081065); Bormio, près rochers du Val Vitelli, 2200–2515 m, 12 vii 1899, *M. Longa* s.n. (Z barcode 000081064); in rupium fissuris et locis glareosis alpium borm. edit. Val Vitelli, 2400 m, s.d., *M. Longa* s.n. (Z barcode 000081063); in rupium fissuris alpium brom. Editorium Val Forcola, 2200 m, 01 viii 1901, *M. Longa* s.n. (Z barcode 000081061); Bormio, hautes rochers calcaires entre le Val Forcola N Caucano, 2600–2800 m, 15 viii 1898, *M. Longa* s.n. (Z barcode 000081060); Tirolia austro-orientalis, Pustaria, ad rupes in monte Glanzerkögele supra Windisch-Matrei, 2000–2150 m, s.d., *Ausserdorfer* s.n. (ZT barcode 00035503).

SLOVENIA. Rdeči Rob, 04 viii 1843, *coll. illegible* s.n. (WU barcode 0071287); Tolmin, Rdeči Rob, 04 viii 1873, *coll. illegible* s.n. (WU barcode 0071276).

SWITZERLAND. Silvretta, Fimbartal östlich der Heidelberger Hütte, 2670 m, 14 vii 1963, *W. Lippert* 00323 (M barcode 0219740); in scopularis valleculae Alpinae ad orientem Casannae montis sitae, e regione Scanss (Engadin), 6000', 02 viii 1850, *Leresche* s.n. (M barcode 0219742); Engadin, Fingerhorn, 9000', viii 1876, *Kränzle* s.n. (M barcode 0219743); Graubünden, Silvretta, oberes Fimbartal südlich Ischgl, 23 vi 1994, *W. Dietrich* s.n. (M barcode 0219744); Alpenpflanzengarten auf dem Rigi, 28 iii 1905, *H. Bachmann* s.n. (Z barcode 000081087); Alpen, Val Muschlerens (Graubünden), viii 1873, *Burnat* s.n. (Z barcode 000081086); Canton des Grisons, Val del Fain au Col du Bernina, 2520 m, 08 viii 1937, *A. Huber-Morath* s.n. (Z barcode 000081085); Zentralalpen, Val de Fain, Pischa, 2650 m, 07 viii 1919, *Braun-Blanquet* s.n. (Z barcode 000081084); Val Muschems, Engadine haute, vii ?, *s.coll.* s.n. (Z barcode 000081081); Graubünden, Remus, U.-Engadin, Spi della Chaldera gg. Piz Ajuz, 2500 m, s.d., *Schmid* s.n. (Z barcode 000081080); Berninaheutal, 2650 m, 25 vii 1905, *Schüffer* s.n. (Z barcode 000081079); Graubünden, Ofenpass-Gruppe, Val dell'Aqua, 16 vii 1902, *St. Brunies & Hegi* s.n. (Z barcode 000081078); Alpes de Scan's, Engadine, 07 viii, *s.coll.* s.n. (Z barcode 000081077); Simplon, vii 1889, *F.-O. Wolf* s.n. (Z barcode 000081076); Graubünden, Eingang in Val Murchems, 23 vii 1902, *St. Brunies* s.n. (Z barcode 000081075); Rochers à l'entrée du val Muschems, embranché du val Trupschum (Engadin), 01 viii 1873, *E. Burnat* s.n. (Z barcode 000081074); Müschems, 19 vii 1871, *s.coll.* s.n. (Z barcode 000081072); Val Müschaunt, bei Scanss, Schüfenhütte, 02 viii 1850, *Muret, Thomas & Leresche* s.n. (Z barcode 000081048); Val Chamuera, 2500 m, viii 06, *s.coll.* s.n. (Z barcode 000081082); V. Chamuera, auf Hang d. Ine?ann, viii 06, *C.* s.n. (Z barcode 000081073); Val Mora, 2000–2300 m, 01 viii 1921, *Furrer* s.n. (Z barcode 000081083).

s.LOC. loc. illegible, s.d., *F. Facchini* s.n. (M barcode 0156402); s.d., *s.coll.* s.n. (WU barcode 0071281).

Material of *Facchinia rupestris* from the Central and Southwest Alps differs markedly. Populations from the Central Alps represent the lower end of the size range of stems and leaves and those from the Southwest Alps the upper end, respectively. The latter populations also frequently have flowers in pairs in contrast to the presence of usually single flowers in populations from the Central Alps. Although Southwest Alpine *Facchinia rupestris* approaches *F. lanceolata*, it never reaches the size of *F. lanceolata* and has a more caespitose and often creeping habit. Interestingly, this intraspecific variation of *Facchinia rupestris* is reflected in our molecular data. In the combined analysis of nuclear and plastid data (Dillenberger & Kadereit, 2014), *Facchinia rupestris* from the Southwest Alps was sister to *F. valentina* rather than to

samples from the Central Alps. When the nuclear data set was analysed alone, however, all *Facchinia rupestris* samples formed a monophyletic species (Dillenberger & Kadereit, unpublished). This difference between data sets may imply that past hybridisation is responsible for the larger size of individuals of *Facchinia rupestris* from the Southwest Alps. Although the combined molecular data (Dillenberger & Kadereit, 2014) and the plastid data alone (Dillenberger & Kadereit, unpublished) imply *Facchinia valentina* (E Spain) as the second species involved, the sympatric *F. lanceolata* is the more plausible candidate from a geographical point of view.

**7. *Facchinia valentina* (Pau) Dillenb. & Kadereit, *comb. nov.*** – *Alsine valentina* Pau, Gazpos Bot. 70. 1891. – *Minuartia valentina* (Pau) Sennen, Pl. Espagne 1918: no. 3627. 1918. – *Minuartia verna* subsp. *valentina* (Pau) Font Quer, Feddes Repert. Spec. Nov. Regni Veg. 69: 13. 1964. – *Minuartia valentina* (Pau) Mateo & Figuerola, IAM Investigación 14: 369. 1987. – *Minuartia valentina* (Pau) Favarger & P. Monts. ex Muñoz Garm. & Pedrol, Anales Jard. Bot. Madrid 44(2): 599. 1987. – Type: Spain, Pico de Espadan, viii 1883, C. Pau s.n. (lecto MA barcode MA35441 [photo!], designated here).

*Alsine pauii* Willk. ex Herv., Scrinia Fl. Select 11: 244. 1892. – *Minuartia pauii* (Willk. ex Herv.) Graebn., Syn. Mitteleur. Fl. [Ascherson & Graebner] 5: 734. 1918. in obs. – *Minuartia verna* subsp. *pauii* (Willk. ex Herv.) Rivas Goday & Borja, Anales Inst. Bot. Cavanilles 19: 331. 1961. – Type: Spain, “Fl. Hispanica: Valencia, Sierra de Espadan, auf Triaskalk, 1800 m”, viii 1891, E. Reverchon s.n. (lecto M barcode 0214967!, designated here; isolecto M barcode 0214968!, WU barcode 0071238!, 0071237!, 0071236! [label in French], 071235!, JE barcode 00014865 [photo!; label in French], 00014864 [photo!; label in French], KFTA barcode 0001270, 0001269, LECB barcode 0000523, HAL barcode 0117902 [photo!], E).

Plants procumbent with ascending axes, 10–20 cm tall; at least pedicels shortly glandular-pubescent. Leaves linear (Fig. 1G), with 3–5 veins, often only the middle vein prominent, 9–14.5 mm long, 0.8–1.6 mm wide, ciliate. Inflorescences with 5 or more flowers. Pedicels 4–10.5(–15.1) mm long, glandular-pubescent. Sepals 5, lanceolate, 2.9–4 mm long, 0.8–1.5 mm wide, with 3–5 veins, acute, shortly glandular-pubescent; petals 5, (ovate-)lanceolate, exceeding sepals (Fig. 7); stamens 10, anthers reddish; styles 3; capsule valves 3, capsules 2.6–4.1 mm long.  $2n = 36$  (Çelebioğlu *et al.*, 1990).

*Distribution.* Endemic to the region north of Valencia/Spain: Sierra de Espadán/Serra d’Espadà, Sierra Calderona, Desierto de Las Palmas (Fig. 2C).

*Habitat and ecology.* Rocky slopes of Buntsandstein (calcareous) in open *Pinus/Quercus* forest, (300–)600–950(–1100) m.

*Typification and synonymy of Facchinia valentina.* – *Facchinia valentina* was described by Pau Español (1891) from “Habita en el mismo pico Espadán”. We found a specimen collected by C. Pau at Pico de Espadán in MA. This specimen was annotated as type material by M. Carrasco in 1973. We were not able to find a publication by



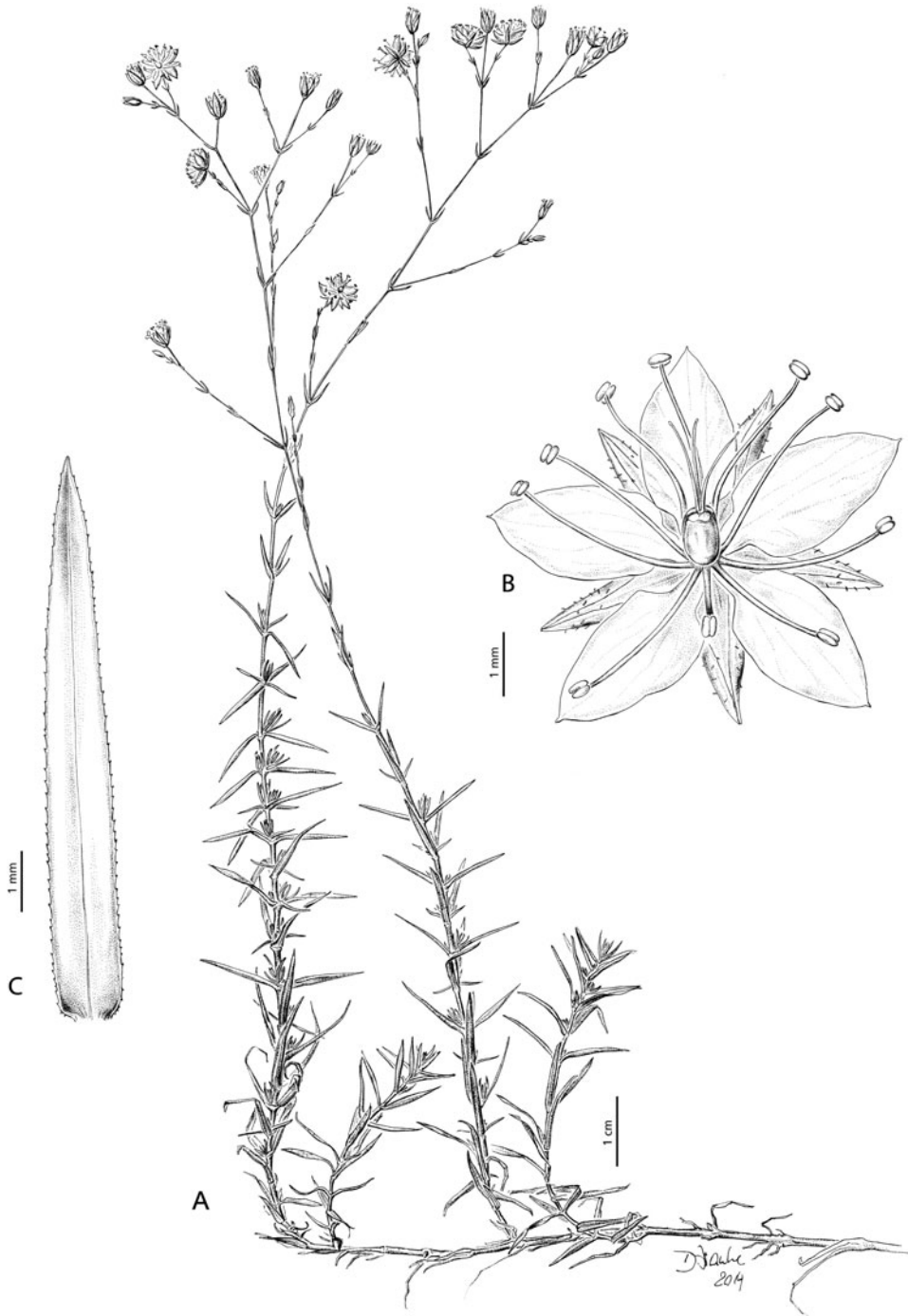


FIG. 7. *Facchinia valentina*. A, habit; B, flower; C, middle cauline leaf.

M. Carrasco designating this specimen (or any other) as lectotype of *Facchinia valentina*. Therefore we designate this specimen here as lectotype.

Based on the information in the protologue of *Alsine pau*i (Hervey, 1892: "Province de Valence, Sierra de Espadan, rochers [Août 1891. legit E. Reverchon]"), we choose as type one of the many specimens collected by Reverchon in August 1891. Since Reverchon is known to have sold many specimens, it is possible that more isolectotypes than those listed exist.

*Additional specimens studied.* SPAIN. Sierra de Espadan, 1500 m, viii, *E. Reverchon* s.n. (M barcode 0214966); Valencia, Sierra de Espadan, 1800 m, viii 1891, *E. Reverchon* s.n. (M barcode 0214967); Valencia, Sierra de Espadan, 1800 m, viii 1891, *E. Reverchon* s.n. (M barcode 0214968); Comunidad Valenciana, Serra d'Espadà, Straße zwischen Alcúdia de Veo und Almedíjar, 0°21'35"W 39°53'24"N, 815 m, 23 vii 2011, *M.S. Dillenberger* 2307-1 (MJG barcode 004131); Comunidad Valenciana, Serra d'Espadà, Straße zwischen Alcúdia de Veo und Almedíjar, 0°21'35"W 39°53'24"N, 815 m, 23 vii 2011, *M.S. Dillenberger* 2307-1 (MJG barcode 004130); Comunidad Valenciana, Serra d'Espadà, Straße zwischen Alcúdia de Veo und Almedíjar, 0°21'35"W 39°53'24"N, 815 m, 23 vii 2011, *M.S. Dillenberger* 2307-1 (MJG barcode 004132); Almedíjar (L'Alt Palància), pr. Fuente Almanzor (Edpanam prov. Castelló), 30SYK21, 600 m, 30 v 1985, *A. Aguilera* s.n. (MSB barcode 005578); Castellon, Alcudia de Veo, 600 m, 12 x 1984, *G. Mateo* 84/452 (VAL barcode 49696); Castellon, Sierra de Espadàn por Torralba del Pinar, 800 m, 07 x 1984, *G. Mateo* 84/455 (VAL barcode 49698); CS, Plana Baixa, Eslida, Solana de la Bellota, YK2817, 948 m, 22 xi 1996, *D. Montesinos i Torres* s.n. (VAL barcode 101627); La Plana Baixa, Ain, Collada d'Ain, UTM YK 21, 700 m, 30 vi 1985, *A. Aguilera* s.n. (VAL barcode 63255); Almedíjar (L'Alt Palància), pr. Fuente Almanzor (Edpanam prov. Castelló), 30SYK21, 600 m, 30 v 1985, *A. Aguilera* s.n. (VAL barcode 40949); Castellon, Alcudia de Veo, Pico Espadàn, 600 m, 07 x 1984, *G. Mateo* 84/453 (VAL barcode 49697); Castellón, Mollet (Vil. La famés), iii 1982, *A. Aguilera* s.n. (VAL barcode 43597); Serra de l'Espada, Castello, La Plana Baixa, L'Alcudia de Veo, Ràpita, 30SYK22, 1000 m, 19 v 1992, *A. Aguilera & J. Riera* 51JBV (VAL barcode 26635); Serra de l'Espada, Castello, L'Alt Palància, Algimia de Almonacid, Bco. del Agua Negra, 30SYK22, 600–860 m, 24 vi 1993, *A. Aguilera & J. Riera* 681-JBV (VAL barcode 30846); Castellon, Torralba del Pinar pr. Pico Pinar, 30SYK12, 950 m, 27 viii 1992, *C. Faregat & S. López Udias* s.n. (VAL barcode 23816); Castelló (Vil. La famés) el Mollet, UTM YK54, iii 1982, *A. Aguilera* s.n. (VAL barcode 724); Alcornocal, Azuébar (Castellón), 650 m, 15 vii 1981, *J.B. Ors.* s.n. (VAL barcode 450); La Plana Baixa, Ain, Collada d'Ain, UTM YK 21, 700 m, 30 vi 1985, *A. Aguilera* s.n. (VAL barcode 13313); Castelló, L'Alcudia de Veo (La Plana Baixa), Ràpita, 30SYK2123, 800 m, 29 vii 1999, *J. Riera & E. Estrelles* s.n. (VAL barcode 40123); Castelló, Algimia de Almonacid (L'Alt Palància), bco. del Agua Negra, 30SYK2320, 720 m, 14 vii 1999, *J. Riera & E. Estrelles* s.n. (VAL barcode 40142); Castelló, L'Alcudia de Veo (Plana Baixa), pic de l'Espadà, 30SYK2420, 1080 m, 05 vi 1999, *J.J. Herrero-Borgonón* s.n. (VAL barcode 41943); Castelló, Torralba del Pinar (L'Alt Millars), ombria del Alto del Pinar, 30SYK1928, 860 m, 29 vii 1999, *J. Riera & E. Estrelles* s.n. (VAL barcode 40124); Castelló, Algimia de Almonacid (L'Alt Palància), capcalera del bco del Agua Negra, 30SYK2220, 800 m, 23 vii 1998, *Güemes, Riera & Estrelles* s.n. (VAL barcode 39650); Castelló, Eslida (La Plana Baixa), font de la Figuera, 30SYK2817, 550 m, 07 vii 1998, *Güemes, Riera & Estrelles* s.n. (VAL barcode 39824); margens umbrosos. Ahin, 11 x 1959, *M. Caldach* s.n. (VAL barcode 127873); Castelló, Chóvar (Alt Paància), Barranco de Ajuez, 30SYK3015, 420 m, 07 x 2007, *J.J. Herrero Borgonón* s.n. (VAL barcode 193191); Castelló, L'Alcudia de Veo (Plana Baixa), serra de l'Espadà, el Ràpita, 30SYK2123, 1050 m, 30 vi 1988, *I. Mateu & J. Güemes* s.n. (VAL barcode 190303); Castelló, Villamalur (L'Alt Millars), pr. Los Vinales, 30SYK22, 600 m, 09 iii 1992, *A. Aguilera & V. Linares* s.n.

(VAL barcode 18593); Castelló, Benicassim (La Plana Alta), Agulles de Santa Àgueda, 31TBE44, 24 v 1992, *A. Aguilera & J. Tirado* AAP-8277 (VAL barcode 23861); Castelló, Torralba del Pinar (Alt Millars), El Tajar, 30SYH12, 900 m, 01 iv 1992, *A. Aguilera & J.M. Calatayud* AAP-7398 (VAL barcode 18558); Castelló, Torralba del Pinar (Alt Millars), monte El Pinar, 30SYK12, 1101 m, 09 iii 1992, *A. Aguilera & V. Linares* AAP-7421 (VAL barcode 18594); Castelló, Villamalur (Alt Millars), Alto del Pinar, 30SYK22, 1047 m, 09 iii 1992, *A. Aguilera & V. Linares* AAP-7404 (VAL barcode 18611); Castelló, Vilafamés (La Plana Alta), Cim del Mollet, 31TBE44, 700 m, 28 vii 1992, *J. Tirado & C. Villaescusa* 3153 (VAL barcode 28381); Castelló, Vilafamés (La Plana Alta), vessant sud del Mollet, 30TYK44, 300 m, 04 vi 1989, *J. Tirado & C. Villaescusa* 265 (VAL barcode 18942); Castelló, Vilafamés (La Plana Alta), vessant sud del Mollet, 30TYK44, 300 m, 04 vi 1989, *J. Tirado & C. Villaescusa* 264 (VAL barcode 18941); Castelló, Segorbe (Alt Palància), bco. de la Jara, 30SYK10, 500 m, 23 vii 1988, *M.B. Crespo & J. Güemes* s.n. (VAL barcode 194863); Valencia, Sierra de Espadan, 1800 m, viii 1891, *E. Reverchon* s.n. (WU barcode 0071238); Valencia, Sierra de Espadan, 1800 m, viii 1891, *E. Reverchon* s.n. (WU barcode 0071237); prov. de Valence, Sierra de Espadan, 1800 m, viii 1891, *E. Reverchon* s.n. (WU barcode 0071236); Sierra de Espadana, viii 1891, *E. Reverchon* s.n. (WU barcode 0071235); Sierra de Espadan, 1500 m, viii 1891, *s.coll.* s.n. (Z barcode 000081093).

*Facchinia valentina* is the largest species of *Facchinia* and also has the largest inflorescences. This species occurs at the lowest altitudes of all *Facchinia* species. Its treatment as a subspecies of *Sabulina verna* (L.) Rchb. (= *Minuartia verna* (L.) Hiern) had already been found to be wrong by Çelebioğlu *et al.* (1990). These authors correctly postulated a close relationship of the species to *Minuartia* sect. *Lanceolatae* (Fenzl) Graebn. sers. *Lanceolatae* and *Grigneensis* Mattf., which was confirmed in the molecular analysis by Dillenberger & Kadereit (2014).

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#### REFERENCES

- AESCHIMANN, D., LAUBER, K., MOSER, D. & THEURILLAT, J. P. (2004). *Flora alpina: Ein Atlas sämtlicher 4500 Gefäßpflanzen der Alpen*. Bern: Haupt Verlag.
- ÇELEBIOĞLU, T., FAVARGER, C. & MONTSERRAT MARTÍ, J. M. (1990). Sur la position systématique et les affinités du *Minuartia valentina* (Pau) Mateo & Figuerola, endémique espagnole. *Collect. Bot. (Barcelona)* 18: 75–85.

- DALLA TORRE, K. W. (1882). *Anleitung zur Beobachtung und zum Bestimmen der Alpenpflanzen*. Wien: Verlag des Deutschen und Oesterreichischen Alpenvereins.
- DAL VESCO, G. (1992). Lectotypificazione di *Arenaria lanceolata* All. *Allionia* 31: 101–106.
- DE CANDOLLE, A. P. (1805). *Flore Française, ou Description succinctes de toutes les plantes qui croissent naturellement en France*, ed. 3. 5(= 4.2). Paris: H. Agasse.
- DILLENBERGER, M. S. & KADEREIT, J. W. (2014). Maximum polyphyly: Multiple origins and delimitation with plesiomorphic characters require a new circumscription of *Minuartia* (Caryophyllaceae). *Taxon* 63(1): 64–88.
- DULAC, J. (1867). *Flore du département des Hautes-Pyrénées*. Paris: F. Savy.
- FAVARGER, C. (1959). Notes de caryologie alpine. III. *Bull. Soc. Neuchâtel. Sci. Nat.* 82: 255–285.
- FAVARGER, C. (1962). Contribution à l'étude cytologique des genres *Minuartia* et *Arenaria*. *Bull. Soc. Neuchâtel. Sci. Nat.* 85: 53–81.
- FIOR, S., KARIS, P. O., CASAZZA, G., MINUTO, L. & SALA, F. (2006). Molecular phylogeny of the Caryophyllaceae (Caryophyllales) inferred from chloroplast *matK* and nuclear rDNA ITS sequences. *Amer. J. Bot.* 93: 399–411.
- FISCHER, M. A., ADLER, W., OSWALD, K. & FISCHER, R. (1994). *Exkursionsflora von Österreich*. Stuttgart: Verlag Eugen Ulmer.
- FISCHER, M. A., ADLER, W. & OSWALD, K. (2005). *Exkursionsflora für Österreich, Liechtenstein und Südtirol*, ed. 2. Linz: Land Oberösterreich, Biologiezentrum der OÖ Landesmuseen.
- FISCHER-OOSTER, C. (1854). Kleine Beiträge zur Flora Deutschlands und der Schweiz. *Flora* 37: 97–101.
- GAY, J. (1824). Histoire de l'*Arenaria tetraquetra*, L. *Ann. Sci. Nat. (Paris)* 3: 27–46.
- GREENBERG, A. K. & DONOGHUE, M. J. (2011). Molecular systematics and character evolution in Caryophyllaceae. *Taxon* 60: 1637–1652.
- GREMELI, A. (1878). *Exkursionsflora für die Schweiz*, ed. 3. Aarau: J. J. Christen.
- HARBAUGH, D. T., NEPOKROEFF, M., RABELER, R. K., MCNEILL, J., ZIMMER, E. A. & WAGNER, W. L. (2010). A new lineage-based tribal classification of the family Caryophyllaceae. *Int. J. Pl. Sci.* 171: 185–198.
- HERVEY, A. B. (1892). *Alsine* Paui Willk. In: MAGNIER, C., *Scrinia Florae Selectae* 11, pp. 244–245. Saint-Quentin: Charles Magnier.
- HOPPE, D. H. (1819). Correspondenz, 1. *Flora* 2: 22–26.
- KOCH, W. D. J. (1835). *Synopsis florae Germanicae et Helveticae, exhibens stirpes phanerogamas rite cognitae, quae in Germania, Helvetia, Borussia et Istria sponte crescunt atque in hominum usum copiosius coluntur, secundum systema Candolleianum digestas, praemissa generum dispositione secundum classes et ordines systematis Linnaeani conscripta*, ed. 1, vol. 1. Frankfurt am Main: Friederici Wilmans.
- MATTFELD, J. (1921). Enumeratio specierum generis *Minuartia* (L.) emend. Hiern. *Bot. Jahrb. Syst.* 57(2, Beibl. 126): 27–33.
- MATTFELD, J. (1922). Geographisch-genetische Untersuchungen über die Gattung *Minuartia* (L.) Hiern. *Repert. Spec. Nov. Regni Veg. Beih.* 15: i–iv, 1–228.
- MCNEILL, J. (1962). Taxonomic studies in the Alsinoideae: I. Generic and infra-generic groups. *Notes Roy. Bot. Gard. Edinburgh* 24(2): 79–155.
- MCNEILL, J., BARRIE, F. R., BUCK, W. R., DEMOULIN, V., GREUTER, W., HAWKSWORTH, D. L., HERENDEEN, P. L., KNAPP, S., MARHOLD, K., PRADO, J., PRUD'HOMME VAN REINE, W. F., SMITH, G. F., WIERSEMA, J. H. & TURLAND, N. J. (2012). *International Code of Nomenclature for algae, fungi, and plants (Melbourne Code): Adopted by the Eighteenth International Botanical Congress Melbourne, Australia, July 2011*. Regnum Vegetabile 154. Königstein: Koeltz Scientific Books.

- MERTENS, F. C. & KOCH, W. D. J. (1826). *J. C. Röhlings Deutschlands Flora*, ed. 3. Frankfurt am Main: Friedrich Wilmans.
- PAU ESPAÑOL, C. (1891). *Gazapos botánicos cazados en las obras del señor Colmeiro, que es director del Jardín Botánico de Madrid, por el farmacéutico Carlos Pau*. Segorbe: Imprenta y librería de Federico Romani y Suay.
- REICHENBACH, H. G. L. (1832). *Flora Germanica excursoria ex affinitate regni vegetabilis naturali disposita, sive principia synopseos plantarum in Germania terrisque in Europa media adjacentibus sponte nascentium cultarumque frequentius*, vol. 2. Leipzig: apud Carolum Cnobloch.
- REICHENBACH, H. G. L. (1841a). *Das Herbarienbuch: Erklärung des natürlichen Pflanzensystems, systematische Aufzählung, Synonymik und Register der bis jetzt bekannten Pflanzengattungen*. Der deutsche Botaniker, Bd. 1. Dresden & Leipzig: In der Arnoldischen Buchhandlung.
- REICHENBACH, H. G. L. (1841b). *Icones Florae Germanicae et Helveticae simul Pedemontanae, Tyrolensis, Istriacae, Dalmaticae, Austriacae, Hungaricae, Transylvanicae, Moravicae, Borussicae, Holsaticae, Belgicae, Hollandicae ergo mediae Europae*, Bd. 5. Leipzig: Fridericum Hofmeister.
- REICHENBACH, H. G. L. (1842). *Deutschlands Flora*, 3. Leipzig: F. Hofmeister.
- RION, A. (1852). Description d'une nouvelle espèce de plante: *Alsine herniarioides* Rion. *Verh. Schweiz. Naturf. Ges.* 37: 178.
- ROUY, G. & FOUCAUD, J. (1896). *Flore de France ou Description des plantes qui croissent spontanément en France, en Corse et en Alsace-Lorraine*, t. 3. Aisnière & Rochefort: Rouy & Foucaud.
- SCHINZ, H. & THELLUNG, A. (1907). Beiträge zur Schweizer Flora. *Bull. Herb. Boissier* II, 7: 387–406.
- SCOPOLI, J. A. (1771). *Flora Carniolica exhibens plantas carnioliae indigenas et distributas in classes, genera, species, varietates, ordine Linnaeano*, ed. 2, vol. 1. Wien: Impensis Ioannis Pauli Krauss.
- SERINGE, N. C. (1824). Caryophylleae. In: DE CANDOLLE, A. P. (ed.) *Prodromus Systematis Naturalis Regni Vegetabilis* 1, pp. 351–422. Paris: Treuttel & Würtz.
- SOMMERAUER, I. (1819). Correspondenz, 1. *Flora* 2: 20–22.
- STAFLEU, F. A. & COWAN, R. S. (1976). *Taxonomic Literature: A selective guide to botanical publications and collections with dates, commentaries and types*, ed. 2, vol. 1. Utrecht: Bohn, Scheltema & Holkema.
- STAFLEU, F. A. & COWAN, R. S. (1983). *Taxonomic Literature: A selective guide to botanical publications and collections with dates, commentaries and types*, ed. 2, vol. 4. Utrecht/Antwerpen, Den Haag/Boston: Bohn, Scheltema & Holkema; Dr. W. Junk b.v.
- STAFLEU, F. A. & COWAN, R. S. (1985). *Taxonomic Literature: A selective guide to botanical publications and collections with dates, commentaries and types*, ed. 2, vol. 5. Utrecht/Antwerpen, Den Haag/Boston: Bohn, Scheltema & Holkema; Dr. W. Junk b.v.
- STEUDEL, E. T. (1841). *Nomenclator Botanicus*, ed. 2. Stuttgart & Tübingen: J. G. Cottae.
- WRABER, T. (1986). Die Felsenmiere (*Minuartia rupestris*) – Vegetation der Julischen Alpen. *Biološki vestnik, Ljubljana* 34(1): 115–125.