



A new species of *Minuartia* (Caryophyllaceae) restricted to the high Andes of South America

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Abstract

A new apetalous species of *Minuartia* from the high Andes of northwestern Argentina, *M. altoandina*, is here described and illustrated. At first sight, *M. altoandina* is morphologically very similar to the European *M. sedoides* because of the absence of petals and ciliate leaf margin with narrow hyaline teeth; however, from a biogeographical point of view, it will probably be related to the North American *M. rossii* complex through the morphology of *M. austromontana*.

Introduction

Minuartia Linnaeus (1753: 89) comprises an estimated 175 species distributed in temperate and arctic areas of Asia Minor, Europe, northern Africa, North America, and South America (Mattfeld 1922, Bittrich 1993, Rabeler *et al.* 2005). Only two species grow in South America: *M. groenlandica* (Retzius 1795: 107) Oestefeld (1920: 226) in southeastern Brazil (Hultén 1964) and *M. acutiflora* (Fenzl 1840: 965) Mattfeld (1921: 28) in southern Chile (Pedersen 1984, Marticorena & Quezada 1985). Latest molecular phylogenetic analyses have shown *Minuartia* to be a polyphyletic genus (Harbaugh *et al.* 2010, Greenberg & Donoghue 2011) and least three subgenera should be removed from *Minuartia*.

During a floristic study of the high Andes of northwestern Argentina, a tiny, moss-like herb with apetalous flowers was collected. DNA could not be obtained from the herbarium voucher, but a morphological analysis showed this plant to resemble *Minuartia sedoides* (Linnaeus 1753: 425) Hiern (1899: 321) and *Minuartia austromontana* S.J. Wolf & Packer (1979: 1676). Although *Minuartia* needs to be redefined as genus (Harbaugh *et al.* 2010), we describe this plant as a new species of *Minuartia* until it may be possible to obtain a new sample for DNA analysis.

Taxonomy

Minuartia altoandina Nicola & Pozner, *sp. nov.* (Fig. 1)

Type:—ARGENTINA. Jujuy: Dpto. Dr. Manuel Belgrano, del Refugio Militar al Chañi Chico, 4,740 m, 24° 02' 13" S, 65° 42' 58" W, 27 January 2012, C.A. Zanotti & M.A. Suescún 269 (holotype SI!).

Minute, moss-like herbs with slender, trailing stems with elongated internodes, rooting at nodes, and producing erect branches with short, reduced internodes. Trailing stems 40–50 × 0.6–0.8 mm with internodes 2–7 mm long and erect branches 10–15 mm long, densely covered by leaves. Leaves of the trailing stems opposite, sessile, shortly connated at base, lanceolate, 1.5–1.8 × 1 mm, recurved, acute-acuminate, 1-nerved; leaves of the erect branches opposite, sessile, shortly connated at base, ovate-lanceolate, 3–3.5 × 1–1.2 mm, erect, apex acute to rounded, 1-nerved, margin minutely pilose (2–5-celled, uniseriate trichomes) at base to papillose at apex. Flowers solitary, terminal. Pedicel reduced. Hypanthium short, dish-like, 0.25 × 1.5 mm;

sepals 5, quincuncial, green, very much like the leaves, shortly lanceolate, $1.5\text{--}2 \times 1\text{--}1.2$ mm, apex acute to obtuse, 1-nerved, margin smooth or pilose-papillose; petals 0; stamens 10, white, 5 opposite to the sepals with a tiny pair of glands (nectaries) at filament base, and 5 alternate stamens without glands, anthers globose, dorsifixed, 0.25×0.25 mm, filaments 1 mm long; gynoecium 3-carpellate, ovary 0.5×0.7 mm, 1-locular with 3 campylotropous ovules arising from a central, short axis, styles 3, free, 1 mm long, stigmatic surface tiny, papillose, running along the inner side of the styles. Fruit and seeds unknown.

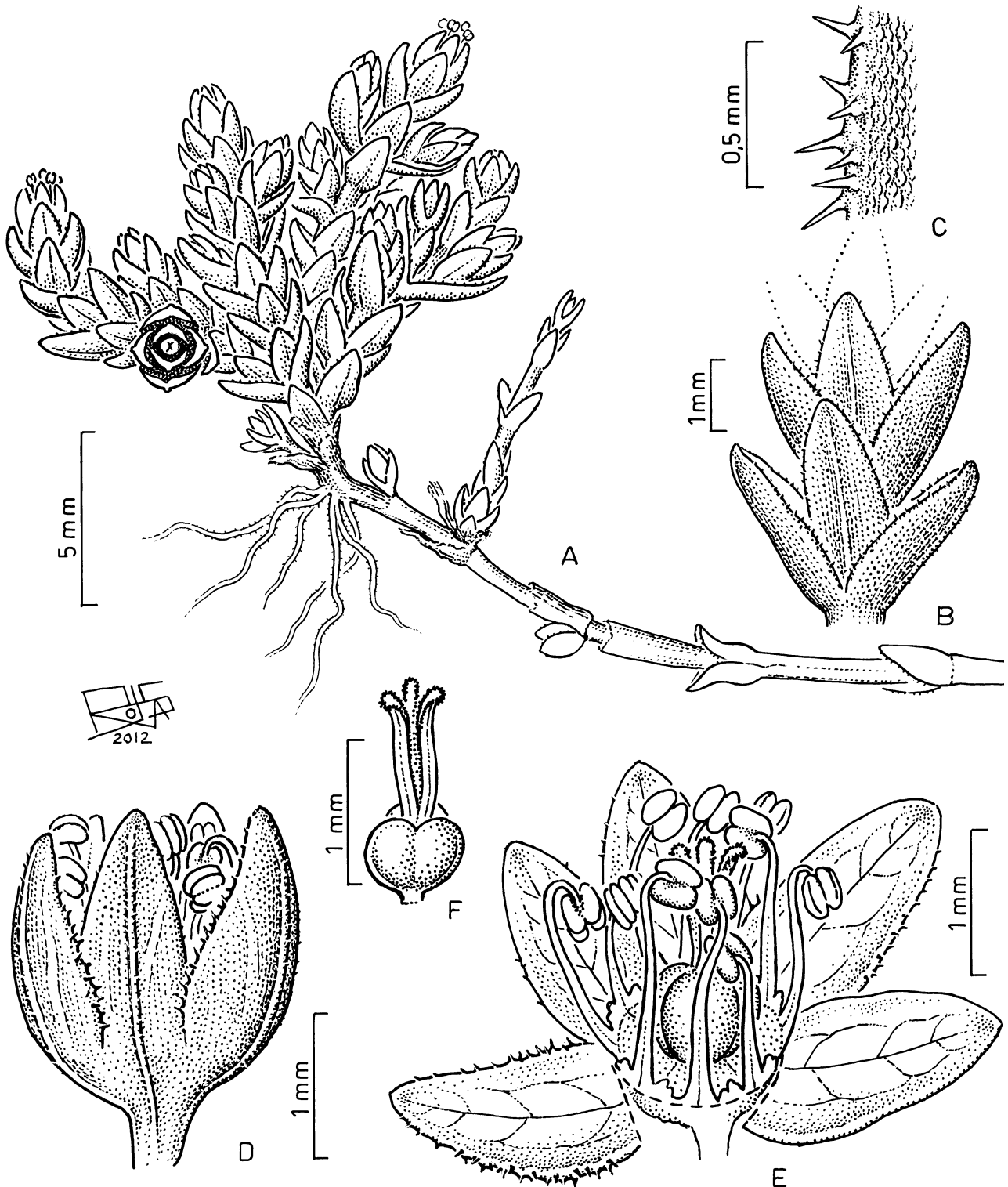


FIGURE 1. *Minuartia altoandina*. A. Plant, general aspect. B. Detail of decussate phyllotaxy. C. Detail of pilose leaf margin. D. Young flower. E. Open, semi-dissected flower. F. Gynoecium. Drawn by Francisco Rojas from C.A. Zanotti & M.A. Suescún 269 (holotype SI).

Distribution and habitat:—High Andes of northwestern Argentina at 4,740 m elevation. Among the most frequent species of the surrounding vegetation are: *Senecio algens* Wedd., *Caiophora nivalis* Lillo, *Calceolaria glacialis* Wedd., *Frankenia triandra* J. Remy, *Oxalis* sp., *Valeriana altoandina* Cabrera, *Valeriana nivalis* Wedd., and *Xenophyllum pseudodigitatum* (Rockh.) V.A. Funk.

Etymology:—Named because of its geographical distribution, in the high Andes of northwestern Argentina.

Discussion

Minuartia altoandina is one of the few species of *Minuartia* which lack petals, morphologically appearing very close to *M. sedoides*, a *Minuartia* species from the mountains of central and southern Europe (Halliday 1993). Both species are apetalous, with narrow hyaline trichomes along the leaf margin, but they can be distinguished because *M. sedoides* has 3-nerved leaves (Halliday 1993, Stace 1997) versus the 1-nerved leaves of *M. altoandina*. However, considering biogeography and morphology, *M. altoandina* is likely to be related to the *M. rossii* complex, which includes three North American species found from the Arctic areas to the Rocky Mountains. The species within this complex have 1-nerved leaves and solitary, terminal flowers with petals developed, rudimentary, or absent (Rabeler *et al.* 2005). *Minuartia austromontana* is the Rocky Mountains member of the complex and is morphologically closest to *M. altoandina*; it can be distinguished because *M. austromontana* has non ciliate leaf margins, pedicellate flowers (pedicels 5–15 mm long) and sepals which are prominently 3-nerved. *Minuartia elegans* (Chamisso & Schlechtendal 1826: 57) Schischkin (1936: 508) is the amphi-Beringian member of the *M. rossii* complex and can be distinguished from *M. altoandina* because *M. elegans* has pedicellate flowers (pedicels 10–40 mm long), sepals weakly 3-nerved and petals usually present, equal to shorter than the sepals. *Minuartia rossii* (R. Brown ex Richardson 1823: 738) Graebner (1918: 772) is the northernmost member of the *M. rossii* complex and can be distinguished from *M. altoandina* mainly because *M. rossii* has non-ciliate leaf margins, usually pedicellate flowers (pedicels 5–20 mm long) and petals half to twice as long as the sepals (Wolf *et al.* 1979, Rabeler *et al.* 2005). The other two *Minuartia* species that have been found in South America, *M. acutiflora* and *M. groenlandica*, are also related to North American taxa (McNeill 1962; Rabeler *et al.* 2005), suggesting that the relationship of *M. altoandina* to the North American *M. rossii* complex seems at least plausible. *Minuartia altoandina* differs from the other two South American species since *M. acutiflora* has linear leaves, pedicellate flowers grouped in 3-5-flowered dichasia (rarely solitary), petals present or absent, and 1-2 stamens; on the other hand, *M. groenlandica* has linear leaves, distal, developed internodes, 3-5-flowered dichasia, pedicellate flowers, and petals twice as long as sepals. *Minuartia* seeds do not possess any particular structure for long distance dispersal (see Wyatt 1984), and therefore, its amphitropical distribution with three scattered species in South America is a remarkable fact.

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