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NOMENCLATURAL NOTES ON SPECIES OF THE GENUS *ARENARIA* (CARYOPHYLLACEAE) IN CHILE

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Abstract. Nomenclatural notes on species of the genus *Arenaria* (Caryophyllaceae) in Chile. *Darwiniana*, nueva serie 10(1): 187-192.

A nomenclatural study of the *Arenaria* names referring to the species found in Chile is presented. Three names, *A. fastigiata*, *A. multicaulis*, and *A. scopulorum*, are illegitimate (Arts. 53.1 and 52.1 of ICN); a new name is proposed for *A. fastigiata* and *A. multicaulis*; *A. scopulorum* was also nomenclaturally superfluous including the type of *A. digyna* (Art. 52.1 of the ICN). *Arenaria digyna*, *A. microphylla*, *A. oligosperma*, *A. pleurantha*, and *A. rivularis* are lectotypified, based on specimens preserved at E, HAL, K, P, and SGO (isolectotypes at B, K, P, and SGO). One epitype (at SI) was designated for *A. rivularis*.

Keywords. Philippi; replacement name; South America; typification.

Resumen. Notas nomenclaturales sobre el género *Arenaria* (Caryophyllaceae) en Chile. *Darwiniana*, nueva serie 10(1): 187-192.

Se presenta un estudio nomenclatural de los nombres de *Arenaria* referidos a las especies presentes en Chile. Tres nombres, *A. fastigiata*, *A. multicaulis* y *A. scopulorum*, son ilegítimos (Arts. 53.1 y 52.1 del ICN); nuevos nombres son propuestos para *A. fastigiata* y *A. multicaulis*; *A. scopulorum* también era nomenclaturalmente superflua, incluido el tipo de *A. digyna* (Art. 52.1 of the ICN). *Arenaria digyna*, *A. microphylla*, *A. oligosperma*, *A. pleurantha* y *A. rivularis* son lectotipificados sobre la base de especímenes conservados en E, HAL, K, P y SGO (isolectotipos en B, K, P, and SGO). Se designó un epitipo (en SI) para *A. rivularis*.

Palabras clave. América del Sur; nombre de reemplazo; Philippi; tipificación.

INTRODUCTION

The genus *Arenaria* L. (Alsinoideae Fenzl, Caryophyllaceae Juss.) comprises about 160 species of annual and perennial herbs mostly distributed in the northern temperate regions, the Mediterranean, and the Andes of South America (Hernández-Ledesma et al., 2015 and literature therein). The molecular data by Greenberg & Donoghue (2011), Dillenberger & Kadereit (2014), and Sadeghian et al. (2015) confirmed that *Arenaria* is polyphyletic. As a result, several species were included into other genera, such as *Ermogone* Fenzl, *Honckenya* Ehrh., *Minuartia* L., *Moheringia* L., *Odontostemma* Benth ex G. Don, *Sabulina* Rchb., *Solitaria* (McNeill) Sadeghian & Zarre, and *Spergularia* (Pers.) J. Presl. & C. Presl. (Conti et al., 2014; Dillenberger & Kadereit, 2014; Iamonico, 2014). The Flora of Chile comprises eight *Arenaria* species, of which three are endemic (Ulloa Ulloa et al., 2017; Rodriguez et al., 2018: 253-254; Zuloaga et al., 2019 [app. 1]: 361).

As part of the ongoing research on this genus (see e.g., Iamonico, 2013; 2014; 2016; 2017; 2019), I here present a contribution concerning nomenclature notes on Chilean *Arenaria* taxa.

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MATERIAL AND METHODS

This work is based on analysis of relevant literature and the examination of 51 specimens kept at herbaria B, BM, CONC, E, HAL, K, P, SGO, and SI (Thiers, 2022 [continuously updated]). The articles of the *International Code of Nomenclature for algae, fungi, and plants* cited throughout the text (e.g. "Art. 52.1") follow the current edition, i.e. the *Shenzhen Code*, hereafter abbreviated as ICN (Turland et al., 2018).

1. Arenaria cordillerana Iamonico, **nom. nov.** pro *Arenaria multicaulis* Phil., Linnaea 28(6): 673. 1856, nom. illeg. hom., non Linnaeus 1759. TYPE: Chile, [Región de Ñuble], cordilleras de Chillan, 1856-1857, *P. Germain s.n.* (lectotype P 01902818!, here designated).

Arenaria multicaulis was published by Philippi (1856: 673-674) based on material collected by P. Germain in "depart. *Chillan*". No original material was found at SGO (V. Ardiles pers. comm.), where Philippi's types are mainly preserved (Muñoz Pizarro, 1960). However, three specimens were found at K and P that bear plants collected in "Baños de Chillan" (K specimens) and "Cordilléres de Chillan" (P specimen). Original labels found on sheets at K do not include neither the date of collection nor the name of the collector, whereas that found at P refers that the specimen was collected by *P. Germain* between 1856-1857. In this context, the specimen showing the best quality of preservation of the diagnostic characters is here designated as lectotype of the name.

Arenaria multicaulis Philippi is illegitimate under the Art. 53.1 of ICN, being a later homonym of *A. multicaulis* L. (1759), a name currently accepted as *A. ciliata* L. (Marhold, 2011). This species was treated in different ways during the time [e.g., considered as synonym of *A. serpens* var. *andicola* (Gillies ex Hook. & Arn.) Rohrb. By Williams (1897: 435) or as taxonomically dubious by Zuloaga et al. (2008)], whereas other authors (Rodríguez et al., 2018; Zuloaga et al., 2019) did not report it at all. Waiting further studies, which are necessary to clarify the taxonomic status of this taxon, we here prefer to be conservative for it and propose a new name for it, which epithet ("cordillerana") refer to the Chilean Coast Range ("*Cordillera de la Costa*" in Spanish) as reported in the label of the lectotype.

2. Arenaria digyna Willd. ex D.K.F. Schltdl., Mag. Neuesten Entdeck. Gesammten Naturk. Ges. Naturf. Freunde Berlin 7(3): 201. 1816. *Arenaria scopulorum* Kunth, Nov. Gen. Sp. [H.B.K.] 6: 31. 1823, nom. superfl. et illeg. TYPE: Peru, in Andibus peruv., alt. 10800 ped., s.d., *F. W. H. A. Humboldt s.n.* (lectotype HAL1 36848!, here designated; isolectotype, B-W 08738-010!).

Schlechtendal (1816: 201) validly published *Arenaria digyna* providing a short diagnosis ("*A.* [Arenaria] *foliis linearis pubescentibus ciliatis, floribus digynis, calycinis foliolis ovatis acutis, pedunculis pubescentibus*") with no further reference to the type material. It is worth noting, however, that the title of Schlechtendal's paper reads "Uber die Stelarien und Arenarien Arten, welche in der Willdenowschen Pflanzensammlung aufbewarth werden" (i.e., Regarding the *Stellaria* L. and *Arenaria* species which are kept in Willdenow's plant collection). Therefore, original material for *Arenaria digyna* should be firstly searched at B, where Willdenow's herbarium is mainly preserved (Stafleu & Cowan, 1988: 298). I traced two specimens at B and HAL coming from Willdenow's herbarium. Since the specimen at HAL is better preserved than the sheet kept at B, we here designate it as the lectotype of the name. This selection maintains the current application of the name (see e.g., Macbride, 1937: 599).

3. Arenaria microphylla Phil., Linnaea 28(6): 675. 1858. TYPE: Chile, Coquimbo, "in editissimis Andibus", s.d., *C. Gay s.n.* (lectotype, SGO 000001934!, here designated).

Philippi (1856: 675) described *Arenaria microphylla* from "In editissimis Andibus provinciae *Coquimbo* legit. cl. Gay". A specimen kept at SGO bears a plant collected by C. Gay in "Coquimbo". Claudio Gay's collections kept at SGO were examined by R. A. Philippi during his floristic research (Taylor & Muñoz-Schick, 1994). Therefore, the material at SGO should be considered as part of the original material used by Philippi (1856: 674) to describe *Arenaria microphylla* and it is here designated as the lectotype of this name.

4. Arenaria oligosperma Gay, Fl. Chil. [Gay] 1: 272. 1845. TYPE: Chile, Coquimbo, La Serena, IX-1836, *C. Gay 112* (lectotype, or possible an holotype, P 01902812!, here designated).

Gay (1845: 272) described *Arenaria oligosperma* based on a collection he made in "La Serena" (Chile) with no further reference. According to Stafleu & Cowan (1976: 925), Gay's herbarium and types are mainly preserved at P, where one specimen was found. It includes one plant and the original Gay's label "*112. Prov. de Coquimbo* | *Arenaria* | *Dans les endroits sombres, dans les rochers. rare* + *fleurs blanches tige couchée assez faible fleurit en aout, 7bre etc.* | *La Serena 7bre 1836* | *Chili*". This specimen is part of the original material of *Arenaria oligosperma* since it matches the diagnosis and locality cited by Gay (1845: 272). Thus, it is here designated as the lectotype. My selection preserves the application of the name for a species endemic to Chile (Reiche 1898; Rodriguez et al. 2018).

Zuloaga et al. (2008), Rodríguez et al. (2018: 253), and Zuloaga et al. (2019, app. 1: 361) reported "Naudin" as the author name of *Arenaria oligosperma*. However, this indication is incorrect. "Naudin" is cited just two times by Gay (1845), the first one in the introduction of the work (Gay 1845: 15), where he stated "Entre los últimos de citar son los señores Barneoud, Naudin, y el señor Montagne..." (= Among the last [authors] there are Messrs [an abbreviation for misters]. Barneoud, Naudin and Mr. Montagne..."). There is a second citation under *Elatine triandra* Schkhur (Gay 1845: 286) where "NAUDIN" was reported just after the habitat and provenance. Therefore, it is clear that in Gay's work (1845) there is no indication of plants treated by Naudin in this work. Therefore, the correct citation, in this case, is *Arenaria oligosperma* Gay, as previously reported by IPNI (2022).

5. Arenaria philippii Iamonico, **nom. nov.** pro *Arenaria fastigiata* Phil., Linnaea 28(6): 674. 1856, nom. illeg. hom., non Smith 1807. TYPE: Chile, [Maule] Cordillera de Linares, I-1856, *P. Germain s.n.* (lectotype, SGO 000001930!, here designated).

Arenaria fastigiata Phil. is a later homonym of *A. fastigiata* Smith, a name previously and validly published in 1807; therefore this name is illegitimate and unavailable for use (Art. 53.1 of the ICN; Turland et al., 2018). In this context, we here propose a replacement name.

Philippi (1856: 674) coined the name *Arenaria fastigiata* for plants collected by P. Germain "In Andibus depart. *Linares*" as reported in the protologue. I found at SGO one specimen which is part of the original material bearing an original label that reads "*Cord. Linares Enero* [January] *1856 P.G.* [Philibert Germain]". This sheet matches Philippi's diagnosis and it is here designated as the lectotype of the name.

6. Arenaria pleurantha Phil., Anales Univ. Chile 81: 763. 1892. TYPE: Chile, [Los Lagos/Aysén], Río Palena, I/II-1887, *F. Delfin s.n. [Herbarium Friderici Philippi no. 2136]* (lectotype, SGO 000001938!, here designated; isolectotypes, K 000471612!; SGO 000001939!).

Arenaria pleurantha was published by Philippi (1892: 763), who gave a diagnosis and the provenance of the species ("Ad flumen Palena in arenis invenit 1887 orn. Frid. Delfin."). According to Stafleu & Cowan (1983: 235), Chilean material by R. A. Philippi is mainly preserved at SGO, whereas duplicates occur in various other herbaria. I traced three specimens at SGO and K bearing plants collected by F. Delfin in 1887 at "Río Palena". I here designate the specimen at SGO 000001938 as the lectotype since it agrees with the protolgue and is better preserved.

7. Arenaria rivularis Phil., Fl. Atacam.: 10. 1860. TYPE: Chile, [Atacama], Agua de Varas, 1860, *R. A. Philippi s.n.* (lectotype K 000471610!, here designated). Chile, Antofagasta, Taltal, Volcán Llullaillaco, 3800 m a.s.l., II-1926, *E. Werdermann 1018* (epitype SI!, plant on the bottom-right of the sheet, here designated; Fig. 1).

Philippi (1860: 10) described *Arenaria rivularis* providing a detailed description and the provenance ("Ad aquam Varas dictam 24°38' lat. mer. c. 9700 p. s. m. ad latera rivuli in caespite latet, aliisque locis similibus occurrit"). I traced four Philippi's collections at HAL, K, and SGO.

Fig. 1. Epitype of the name *Arenaria rivularis* (SI!). Color version at http://www.ojs.darwin.edu.ar/index.php/darwiniana/article/view/967/1253

These mentioned specimens were collected at "des. [= desert] Atacama" (N-Chile, HAL 0118111), "Tarapacá" (a region of N-Chile; K 000471611), and "Agua de Varas" (currently Aguada de Varas in N-Chile, SGO 000001940 and K 000471610). The HAL specimen mentioned just a generic locality ("des. [= desert] Atacama") which includes "Agua de Varas"; however, being other specimens available, we prefer to exclude it from the lectotypification purpose. K 000471610 is part of the original material, and includes a little part of one plant with few flowers and the label "*Arenaria rivularis Phil.* | *Agua de Varas Chile* | *Philippi 1860*". While K 000471611 has the annotation "*Arenaria rivularis Ph.* | *Tarapacá*", and consists of a terminal flowered part of one plant. Finally, the specimen SGO 000001940 bears six parts of plants and the following three original labels (right side of the sheet): "*des. Atacama* | *I 1885*" and "*Rio Juncal 3800 m* | *Januar 1885 F. Ph.*" (Juncal river is located in the Atacama Desert), and "*ad Agua de Varas in deserto Atacamensi* | *Januaris 1854*". On the basis of the protologue information, we should consider the plants collected "*ad Agua de Varas in deserto Atacamensi*" (Philippi, 1860: 10), as the original material of the species. Unfortunately, exsiccata and labels are not clearly associated, in SGO 000001940, since the labels report two different localities and dates of collections. As a consequence, we cannot be sure which exsiccatum was collected at "*Agua de Varas*" and, therefore, the specimen SGO 000001940 is discarded as as a putative lectotype of *A. rivularis*.

In summary, and considering that K 000471610 includes a label with the exact locality reported in the protologue by Philippi (1860: 10), we here designate it as the lectotype of *Arenaria rivularis*. The plant on K sheet (as well as that on HAL specimen) is not well preserved and the character of flowers, which are important for the identification of the species, cannot be well observed. So, the lectotype cannot be critically identified for purposes of the precise application of Philippi's name and, according to the Art. 9.9 of ICN, we selected an epitype (Herbarium SI, Werdemann's collection) which serves an interpretative type according to the Art. 9.6 of ICN showing sepals (venation is the important character) and fruit (dehiscence/indehiscence). Both lecto- and epitype corresponds to the current concept of the species (Volponi, 1985: 336; 1994: 181).

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