



Confirmation of *Valeriana nivalis* (Valerianaceae) to the Argentinian flora

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Abstract

We confirm the occurrence of *Valeriana nivalis* to the Argentinean flora, based on results of both morphological and molecular phylogenetic studies. We also include a taxonomic description, distribution, and additional information to discern *V. nivalis* from *V. pycnantha*.

Key words: Argentina, Flora, New record, Taxonomy, *Valeriana*

Introduction

Valeriana Linnaeus (1753: 31) includes ca. 250 species distributed all over the world except Australia and New Zealand. Most *Valeriana* species grow in temperate regions of the northern hemisphere, and particularly along the South American Andes, which is an important center of secondary diversification (Kutschker 2008a, 2011). The Argentinean flora includes 48 species of *Valeriana*, mainly distributed along the Andes and central mountains (Xifreda 1999, Kutschker 2008b, 2011).

Diagnostic characters used to discriminate species in most local taxonomic and floristic works on *Valeriana* (eg. Borsini 1942, 1944, 1966, 1999, Cabrera 1993) are considered inadequate (Reese-Krug & Weberling 1991). In addition, some nomenclatural problems have come to light (Reese-Krug & Weberling 1991, 1996). *Valeriana nivalis* Wedd. was recorded for Argentina by Borsini (1942, 1944, 1966, 1999) and Cabrera (1993). However, those records were based on specimens of *Valeriana pycnantha* A. Gray (Reese-Krug & Weberling 1991) and so *V. nivalis* did not occur in later accounts (Xifreda 1999; Kutschker 2008a).

After examining new collections from Jujuy province, Argentina (specimens from BAA, CONC, F, LIL, SI, ULM) and original descriptions, we confirm the existence of *V. nivalis* to the Argentinean flora. This taxonomic placement was confirmed using molecular phylogenetic analysis, based on Bell et al. (2012). Morphological description, distribution and additional material examined of *V. pycnantha* are also included to update information of a sympatric species that could be easily confused with it. In addition, we include *V. altoandina* Cabrera as a new synonym of *V. nivalis* based on a morphological analysis.

Materials and methods

We examined collections from BAA, CONC, F, LIL, SI, ULM, original descriptions, floras (Borsini 1942, 1944, 1966, 1999, Cabrera 1993) and taxonomic works (Reese-Krug & Weberling 1991).

We amplified and sequenced the chloroplast marker *trnL-F* and the ribosomal ITS region of *V. nivalis* and *V. pycnantha*. DNA extraction, sequencing and alignment were carried out as described in Bell et al. (2012). We used Maximum Likelihood (ML) analysis to infer phylogeny as performed in Bell et al. (2012). Specimens used in molecular analysis are marked with (*) in the list of examined material of each species. Taxon names and GenBank accession numbers for ITS and *trnL-F* sequences used in the phylogenetic analysis are given in TABLE 1.

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References

- Bell, C.D., Kutschker, A. & Arroyo, M.T.K. (2012) Phylogeny and diversification of Valerianaceae (Dipsacales) in the southern Andes. *Molecular phylogenetics and evolution* 63: 724–737.
<http://dx.doi.org/10.1016/j.ympev.2012.02.015>
- Borsini, O.E. (1942) Valerianáceas de Tucumán. *Lilloa* 8: 353–377.
- Borsini, O.E. (1944) Valerianaceae. In: A. H. Descole (ed.), *Genera et Species Plantarum Argentinae II*. Fundación Miguel Lillo, Talleres gráficos de G. Kraft Ltda. S.A., Tucumán: 275–372.
- Borsini, O.E. (1966) Valerianáceas de Chile. *Lilloa* 32: 375–476.
- Borsini, O.E. (1999) Valerianaceae. In: M. N. Correa (ed.), *Flora Patagónica. Colección Científica del Instituto Nacional de Tecnología Agropecuaria* 8(6): 448–468.
- Cabrera, A.L. (1993) Valerianaceae. In: A. L. Cabrera (ed.), *Flora de la Provincia de Jujuy. Colección Científica del Instituto Nacional de Tecnología Agropecuaria* 13(9): 443–469.
- Gray, A. (1862) Valerianaceae. *Proceedings of the American Academy of Arts and Sciences* 5: 322.
- Kutschker, A.M. (2008a) Valerianaceae. In: F. O. Zuloaga, O. Morrone & M. J. Belgrano (eds.), *Catálogo de las Plantas Vasculares del Cono Sur. Monographs in systematic Botany from the Missouri Botanical Garden* 107(3): 3091–3101.
- Kutschker, A.M. (2008b) Morfología del fruto en especies de *Valeriana* (Valerianaceae) de los Andes australes. *Darwiniana* 46(1): 17–35.
- Kutschker, A.M. (2011) Revisión del género *Valeriana* (Valerianaceae) en Sudamérica austral. *Gayana Botánica* 68(2): 244–296.
<http://dx.doi.org/10.4067/s0717-66432011000200016>
- Linnaeus, C. (1753) *Species Plantarum*, vol. 1. Laurentius Salvius, Stockholm, 560 pp.
- Reese-Krug, H. & Weberling, F.H.E. (1991) Zur taxonomie hochandiner *Valeriana*-Arten (Valerianaceae) I. *Valeriana nivalis* Wedd. und *V. pycnantha* A. Gray. *Botanische Jahrbücher Systematik* 112(3): 399–410.
- Reese-Krug, H. & Weberling, F.H.E. (1996) Zur taxonomie hochandiner *Valeriana* - Arten (Valerianaceae). II. *Valeriana globularis* A. Gray, *V. condamoana* Graebn, und *V. petersenii* sp. nov. *Botanische Jahrbücher Systematik* 118 (2): 159–175.
- Weddell, H.A. (1858) *Chloris andina* II. P. Bertrand, Paris. 316 pp.
- Xifreda, C.C. (1999) Valerianaceae. In: F. O. Zuloaga & O. Morrone (eds.), *Catálogo de las Plantas Vasculares de la República Argentina II. Monographs in Systematic Botany from the Missouri Botanical Garden* 74: 1131–1136.