

## *Dicranella hookeri* (Dicranaceae, Bryophyta) in northern Argentina

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### Abstract

*Aongstroemia lorentzii* Müll.Hal. from the central Andes of subtropical Argentina is taxonomically evaluated and some diagnostic traits of its type material are illustrated. This species is revealed to be inseparable from *Dicranella hookeri* (Müll. Hal.) Cardot, a pan-south-temperate species which extends into the Neotropics along the Andean chain. This discovery represents the first record of *D. hookeri* from northern Argentina and this locality bridges the continuous south-temperate range of the species, extending from Tierra del Fuego to central Chile, with its altimontane stations in Bolivia.

### Introduction

*Dicranella hookeri* (Müll.Hal.) Cardot is a pan-south-temperate species which has optimum occurrence in cool-temperate regions in the Southern Hemisphere (Ochyra *et al.* 2008a, b, 2013; Larraín *et al.* 2010). In South America it is particularly frequent in the *Nothofagus* zone on the western fringes of the continent, from the Valdivian region in Chile at latitudes of c. 37°S to Tierra del Fuego (Greene 1986), but it extends northwards to Elquin Province in the northern part of Coquimbo Region (V) at latitudes of c. 30°S (He 1998; Müller 2009). In addition, in the American sector its range covers the Falkland Islands (Matteri 1986), subantarctic South Georgia (Newton 1977) and the northern maritime Antarctic (Ochyra *et al.* 2008a, b). As is the case with many south-cool-adapted species, *D. hookeri* extends northwards into the Neotropics along the Andean chain, where it occurs at altimontane elevations. So far, the species was known from the central Andes of Bolivia (Churchill *et al.* 2000) and Peru (Blockeel *et al.* 2007) and the northern Andes of Ecuador, Colombia and Venezuela (Churchill *et al.* 2000).

Apart from the Andes, *Dicranella hookeri* was also reported from Brazil (Delgadillo *et al.* 1995; Yano 1996) but without indicating the source of this record. It seems to be a dubious record since the species is not listed in the latest checklist of Brazilian mosses (Costa *et al.* 2011). These authors reported the species also from the West Indies, but again without a reference to the original report or the citation of specimens. It is likely that these reports are a result of taxonomic and nomenclatural confusion introduced by Mitten (1869) who considered *D. hookeri* to be conspecific with *Anisothecium jamesonii* Mitt., although the latter is actually identical to *D. vaginata* (Hook.) Cardot, a distinct neotropical species, occurring from Mexico to Peru and SE Brazil (Yano 1981; Allen 1994; Churchill *et al.* 2000).

According to Churchill *et al.* (2000), the altitudinal range of the species extends in the Andes from 2250 m in Bolivia to 4100 m in Ecuador and Colombia. However, the highest known locality of *D. hookeri* is in Bolivia at an elevation of ca 4500 m, in Los Andes Province in Departamento La Paz, where the moss was collected along a trail between Laguna Tuni and a pass between Cerro Jisthaña and Nevado Huayna Potosi (Marco Lewis 82–350, KRAM as *Dicranella cardotii* (R.Br.bis) Dixon).

*Dicranella hookeri* is a variable species, although its variation refers mostly to the overall appearance and size of the plants, as well as the leaf stance and length. For that reason various phenotypes of this species originating from different parts of the world were often given taxonomic recognition as separate species or infraspecific taxa (Matteri and Ochyra 1999; Ochyra 1999). Nevertheless its essential diagnostic features remain relatively stable. The species is distinguished by its long, widely spaced and erect-spreading leaves which consist of a loosely sheathing base gradually, or less often abruptly, narrowed into a channelled subula ending with an acute or obtuse apex. In addition, the laminal cells are smooth throughout and unistratose in the vaginant base and variously bistratose at the shoulders and in the subula.

During the course of the present study the original material of *Aongstroemia lorentzii* Müll.Hal. was located and taxonomically assessed. This species was described from the Andes of northern subtropical Argentina (Müller 1882). It was subsequently shifted between genera of dicranalean mosses, including *Dicranella* (Müll. Hal.) Schimp., *Dichodontium* Schimp., and *Anisothecium* Kindb., but it was only recently evaluated by Suárez *et al.* (2013) who considered it as a distinct species. However, on the basis of its diagnosis accompanied by a taxonomic discussion, one may assume that this species is closely related or identical to *Dicranella hookeri*.

### A taxonomic assessment of *Aongstroemia lorentzii*

*Aongstroemia lorentzii* is primarily recognised by the characteristic shape of the leaves and their stance. They are widely spaced, smaller below and become progressively larger towards the stem tip, 1.4–1.8 mm long and 0.5–0.6 mm wide at their base. They consist of a broadly ovate, oblong-ovate to nearly quadrate, loosely clasping base which is gradually or rather abruptly narrowed to a channelled, erect to slightly spreading, straight or usually altered on drying, subula about twice as long as the leaf base, having margin entire and apex obtuse to subacute (Figs 1.1–2). The leaf base is not tightly appressed to the stem but erecto-patent and it is often not sheathing on the lower leaves or on those of innovations.

The leaves have a single, subpercurrent costa, 60–80 µm wide proximally, clearly delimited from the laminal cells and merging with the bistratose laminal cells in the subula (Figs 1.3–5). Consequently, it appears as seemingly filling the entire subula. The laminal cells are smooth throughout, short- to long-rectangular, 25–60 µm long, 8–12 µm wide, unistratose, pellucid and not differentiated at the basal angles. The cells at the leaf shoulder are short-rectangular to subquadrate, unistratose or variously bistratose towards the costa and then relatively obscure (Fig.1.6).

The type material of *Aongstroemia lorentzii* is in fine fruiting condition. The capsules are erect, obloid, 0.9–1.1 mm long, symmetrical, with a stoutly rostrate operculum having an oblique beak equal to the urn in length. The peristome teeth are about 350 µm long, broadly triangular, divided nearly halfway to the base and vertically pitted-striolate on the outer surface. The spores are globose, 26–28 µm in diameter, pale brownish and minutely papillose.

All the characters of *Aongstroemia lorentzii* fall perfectly in the range of variation of *Dicranella hookeri*. The type material of *A. lorentzii* and *D. hookeri* only differ in some minor details. The plants of the latter are smaller and have a straight to somewhat flexuose leaf subula, whilst plants of *A. lorentzii* are larger but more slender and have a strongly flexuose leaf subula. These features are of no special taxonomic importance and are subject to strong variation in changing environmental conditions. Accordingly, the names of the two species are considered synonymous, of which *D. hookeri* has priority.

Müller (1882) compared *Aongstroemia lorentzii* to *A. vaginata* (Hook.) Müll.Hal., which is now considered as *Dicranella vaginata*, and *A. jamesonii* (Taylor) Müll.Hal., which are actually conspecific species (Mitten 1869). Although *D. vaginata* was often confused with *D. hookeri*, the two species are unquestionably distinct. The former is immediately distinguished by having a strongly clasping leaf base, giving the stems a smooth julaceous look. Its vaginant leaf base forms a characteristic flange at the shoulders where it is rapidly contracted to a widely spreading or squarrose, setaceous subula of about the same length as the base. Moreover, the peristome teeth of *D. vaginata* are shorter, 250 µm long, reddish-brown below and hyaline above and densely papillose, and the spores are smaller, about 20 µm in diameter.

Since the type material of *Aongstroemia lorentzii* matches the type material of *Dicranella hookeri*, the following new synonymy is proposed.

***Dicranella hookeri*** (Müll.Hal.) Cardot

*Bulletin de l'Herbier Boissier, Séries 2, 6: 19 (1906).*

*Aongstroemia hookeri* Müll.Hal., *Synopsis Muscorum Frondosorum 2: 607 (1851).*

*Anisothecium hookeri* (Müll.Hal.) Broth. in Engl., *Natürlichen Pflanzenfamilien, Ed. 2, 10: 178 (1924).*

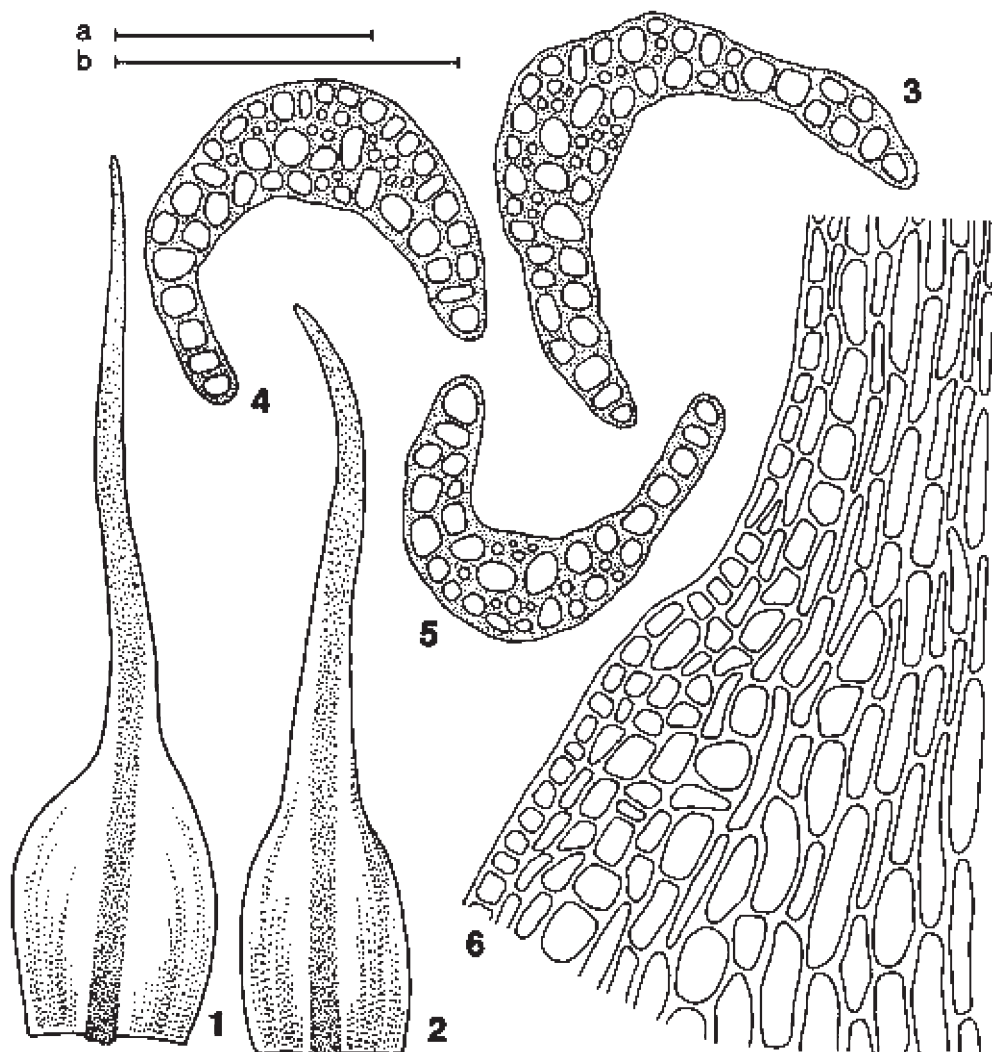
Type citation: Insula Eremitae ad Cap. Horn: J. D. Hooker [Lectotype (*vide* Ochyra *et al.* 2008b: p. 167): BM-Wilson!; isotype: FH-Taylor!].

*Aongstroemia lorentzii* Müll.Hal., *Linnaea 43: 389 (1882).*

*Dicranella lorentzii* (Müll.Hal.) Kindb., *Enumeratio Bryinearum Exoticarum: 89 (1889).*

*Dichodontium lorentzii* (Müll.Hal.) Paris, *Index Bryologicus: 322 (1894).*

*Anisothecium lorentzii* (Müll.Hal.) Broth. in Engl., *Natürlichen Pflanzenfamilien, Ed. 2, 10: 178 (1924).*



**Fig. 1.** *Dicranella hookeri*. 1–2. Leaves. 3–5. Transverse sections of leaves, sequentially from base to apex. 6. Laminal cells at leaf shoulder. (All from *Lorentz s.n.*, without date, H-BR, isotype of *Aongstroemia lorentzii*). Scale bars: a. 100  $\mu$ m (6); b. 1 mm (1, 2) and 100  $\mu$ m (3–5).

Type citation: Argentina subtropica, Sierra de Tucumán, in alpinis „der Cienega”, 1872. [Lectotype (*vide* Suárez *et al.* (2013: p. 54): “Herb. Emil Bescherelle: 1900 *Ångstroemia* (Diobelon) Lorentzii C. Müll. Sierra de Tucumán, in alpinis der Cienega 1872” – BM-Bescherelle!; isotype: “ab auctore *Ångstroemia* (*Dicranella*) Lorentzii C. Müll. Argentina Tucumanensis, Sierra de Tucumán, alpina leg P. G. Lorentz com. Schliephacke” – H-BR!], *syn. nov.*

**Additional specimen examined:** ARGENTINA. TUCUMÁN, Depto. Tafi del Valle: ruta prov. 307, km 72, La Bolsa, en lecho del río, alt. 2250 m a.s.l., 12 Apr 1995, *Schiavone & Bissuso 1457* (KRAM).

### Phytogeographical implications

*Dicranella hookeri* has hitherto been unknown in northern Argentina. Apart from the type material of *Aongstroemia lorentzii* one more specimen from this region was examined. Suárez *et al.* (2013) cited some additional specimens from the province of Tucumán but these were not available for the present study. The species is common in the southern part of the country in the Andean Patagonia and in Tierra del Fuego and extends northwards to latitudes of *c.* 40°S (Greene 1986). Only in Chile does it reach more northerly isolated sites in the Andes to latitudes of *c.* 30°S. Then *D. hookeri* recurs in the Andes of Bolivia, so its discovery in the province of Tucumán nicely bridges the continuous range in southern South America with isolated altimontane stations in the central and northern Andes. At the same time, in this region the range of *D. hookeri* overlaps the range of its tropical vicariant species, *D. vaginata*, which is scattered in the province of Córdoba (Housseus 1938a, b).

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