



Fertile plants of *Lejeunea capensis* (Lejeuneaceae, Marchantiophyta) in the Chaco Serrano forest from Tucumán (Argentina)

Plantas fértiles de *Lejeunea capensis* (Lejeuneaceae, Marchantiophyta) en el Bosque Chaqueño Serrano de Tucumán (Argentina)

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ABSTRACT

Fertile plants of *Lejeunea capensis* were found in Tucumán, Argentina. The population discovered in the Chaco Serrano represents a new location with respect to the nearest occurrences in Northwest of Argentina and constitutes the first record of sporophyte-bearing plants. Here we provide an amended description and an illustration including the first time data of the sporophyte of *L. capensis*.

Keywords — Chaco Serrano; Lejeuneaceae; liverworts; Marchantiophyta; sporophyte.

RESUMEN

Plantas fértiles de *Lejeunea capensis* fueron encontradas en Tucumán, Argentina. La población descubierta en el Chaco Serrano representa una nueva locación con respecto a sus ocurrencias más cercanas en el Noroeste de Argentina y es el primer registro

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de plantas con esporofitos. Aquí proporcionamos una enmienda de la descripción original e ilustraciones que incluyen por primera vez el esporofito de *L. capensis*.

Palabras clave — Chaco Serrano; esporofito; hepática; Lejeunaceae; Marchantiophyta.

INTRODUCTION

In the course of a project evaluating the bryophyte diversity in the Chaco Serrano from Tucumán, we found fertile specimens of a liverwort identified as *Lejeunea capensis* Gottsche. It belongs to the tropical and large family Lejeunaceae, and has an afro-american distribution (Giancotti & Vital, 1989).

This taxon was first collected in Argentina (Salta, N of Orán) by P. G. Lorentz in 1873. Lorentz, author of a pioneering study on regionalization of vegetation in Argentina (Lorentz 1876, cited after Arana *et al.*, 2021), sent at least part of his collections for determination to colleagues in Europe. The specimens from Salta were described by J. B. Jack & F. Stephani as *Eulejeunea clavatiflora* in 1895. The synonymy of *E. clavatiflora* with *Lejeunea capensis* was proposed by Reiner-Drehwald & Schäfer-Verwimp (2008), who included three new collections from the provinces Jujuy and Salta. Sporophytes in the family Lejeunaceae bear important morphological information used for phylogenetic analysis of genera (Gradstein *et al.*, 2003; Weis, 2001; Reiner-Drehwald & Weis, 2001). Unfortunately, sporophytes are fragile and often not found in the collections. In this paper we present for the first time a description and an illustration of the sporophyte of *Lejeunea capensis*.

MATERIAL AND METHODS

This study is based on examination of fresh material housed in LIL (Thiers, 2022). In this work the following information is provided: description, selected synonyms (with reference for local synonymy), illustrations, comments, world distribution, vegetation and substrate types of *Lejeunea capensis*, selected specimens examined, and distribution in Argentina based on the studied collections.

RESULTS

Taxonomic treatment

Lejeunea capensis Gottsche, in Gottsche, Lindenberg & Nees, Syn. Hep.: 374. 1845. *Inflatolejeunea capensis* (Gottsche) S. Arn., Hapat. South Africa: 185. 1963. Type. South Africa. “in Promontorio Bonae Spei” (= Cape of Good Hope) “ad rupes Cataractae montis Duyvelsberg” [syntypes: G00282271 (= G 007894)!, G00282272 (= G 007890)!] (Fig. 1).

= *Lejeunea clavatiflora* (J.B. Jack & Steph.) Steph., Spec. hepat. 5: 727. 1915.
Eulejeunea clavatiflora J.B. Jack & Steph., Hedwigia 34: 315. 1895. TYPE. Argentina. Salta, N of Oran, 1873, Lorentz s.n. [LECTOTYPE (DESIGNATED by Reiner-Drehwald & Schäfer-Verwimp, 2008): G00282347 (= G 026025)!; isolectotype: G00282348 (= G 026024)!].

The following gametophyte description generally confirms the observations present in Reiner-Drehwald & Schäfer-Verwimp (2008). Plants \pm shiny, from light-green to slightly yellow, growing on bark of living trees. Stems with epidermal cells in ventral view quadrate to rectangular $18-40 \times 18-45 \mu\text{m}$; branches of *Lejeunea*-type, few, similar to the main shoot, collars small, most branches fertile. Leaves imbricate, widely spreading. Lobes ovate-triangular, slightly concave, apex rounded to subacute, margin plane to slightly reflexed, entire. Marginal leaf cells quadrate to rectangular, $12-16 \times 12-18 \mu\text{m}$, median cells isodiametric to elongated, $16-30 \times 25-30 \mu\text{m}$, basal cells elongated $15-20 \times 30-45 \mu\text{m}$; cell walls thin, trigones mostly small. Lobules small size, apex with unicellular tooth; keel slightly arched. Underleaves imbricate to contiguous, ovate, $180-280 \times 160-310 \mu\text{m}$, \pm as wide as long, sinus U- to V-shaped, lobes triangular, straight, apex subacute, 1(-2) cells in a row at the apex, 7-8 cells wide at the base, margins entire, base cuneate, insertion line slightly arched, rhizoids seldom developed.

Autoicous, male branches seldom found. Androecia terminal on short branches, 2-3 pairs of bracts, bracts imbricate, 1 bracteole at the base of the spike. Gynoecia terminal on the main shoot or branches, with 1-2 innovations of lejeuneoid type, innovations often fertile, 2-3 gynoecia in a row. Female bract lobes ovate, $500-600 \times 250-270 \mu\text{m}$, margin entire, apex rounded to subacute, often recurved. Perianths emergent between the bracts $1/3-1/4$ its length, without keels or only slightly angled at the summit, beak pronounced and variable, cylindrical to trumpet-shaped. Sporophyte with seta hyaline, articulate, made up of 4 inner and 12 outer rows of cells; capsules globose, pale-colored, valves suberect after dehiscence, valve wall cells rhomboidal, $60-65 \times 18-31 \mu\text{m}$ to apex, smaller to the base $20-25 \times 10-13 \mu\text{m}$, spores elongate to ellipsoidal, $25-50 \times 18-30 \mu\text{m}$, papillose, spore wall with rosettes of papilla, marginal elaters attached by their tips to the valve margin, $220-250 \mu\text{m}$, with reduced spirals. The number of marginal elaters and the presence of additional elaters could not be assessed.

Specimens examined.— ARGENTINA. Prov. Tucumán, Dpto. Trancas, San Pedro de Colalao, sobre sauce caído al costado del río Tipas, $26^{\circ}14'44''\text{S } 65^{\circ}31'20''\text{W}$, 1122 m asl, 06-III-2021, G. Suárez 1901 (LIL); camino a Piedra Pintada, $26^{\circ}15'19''\text{S } 65^{\circ}32'20''\text{W}$, 1176 m asl, 15-VII-2021, G. Suárez 1831 (LIL); borde del río Tipas, $26^{\circ}14'42''\text{S } 65^{\circ}31'18''\text{W}$, 1121 m asl, 07-II-2022, G. Suárez 1900 (LIL); camino a Piedra Pintada, 26-II-2022, G. Suárez 1921 (LIL); borde del río Tipas, sobre sauce, 02-III-2022, G. Suárez 1920 (LIL); borde del río Tipas, 13-IV-2022, G. Suárez 1922 (LIL).

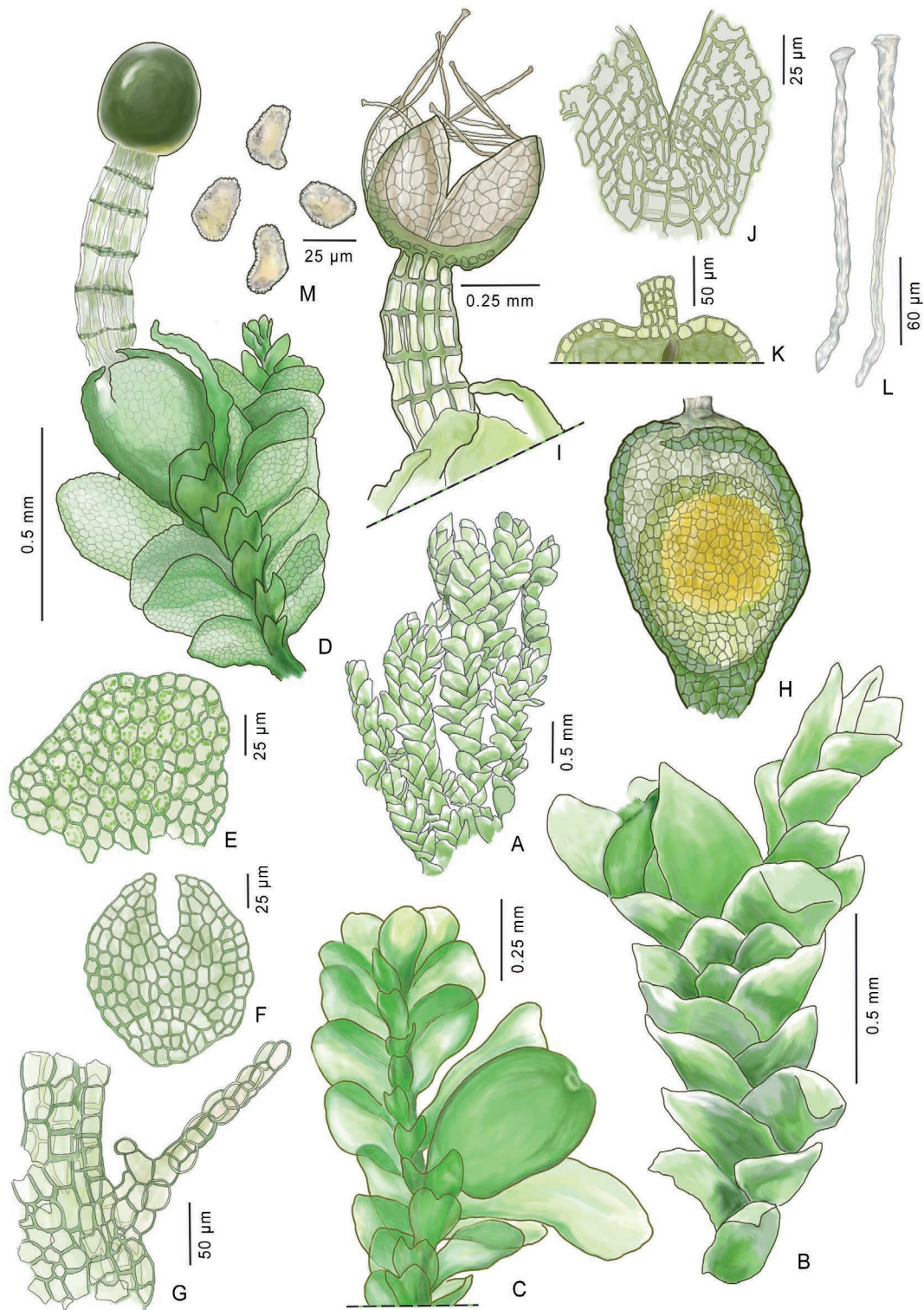


Fig. 1. *Lejeunea capensis* Gottsche. A) Sterile shoot, dorsal aspect. B-C) Plants with perianth (B dorsal view, C ventral view). D) Fertile plant. E) Leaf (apex). F) Underleaf. G) Vestigial lobule. H) Perianth with immature sporophyte. I) Seta with open capsule. J) Detail of capsule valves. K) Detail of the perianth beak. L) Elaters. M) Spores. (all from G. Suárez 1900).

Fig. 1. *Lejeunea capensis* Gottsche. A) Planta estéril, aspecto dorsal. B-C) Plantas con periantio (B vista dorsal, C vista ventral). D) Planta fértil. E) Hoja (ápice). F) Anfigastro. G) Lobulo vestigial. H) Periantio con esporofito inmaduro. I) Seta con cápsula abierta. J) Detalle de las valvas. K) Detalle de periantio con rostro. L) Eláteres. M) Esporas. (basadas en G. Suárez 1900).

World distribution.— *Lejeunea capensis* presents an Afro-American distribution pattern (Giancotti & Vital, 1989), a disjunction found in several mosses and liverworts (e.g. Jimenez *et al.*, 2015; Suárez & Schiavone, 2008). In Africa *L. capensis* is distributed in Sub-Saharan Africa and Madagascar (Grolle, 1995; Wigginton & Grolle, 1996), extending to the Republic of Yemen (Jones, 1987; Kürschner, 2000). In America it was recorded for Mexico, Venezuela, Brazil (Southeastern region [Minas Gerais, Rio de Janeiro and São Paulo states] and Southern region [Paraná and Rio Grande do Sul]), and Argentina (Reiner-Drehwald & Schäfer-Verwimp, 2008). For Brazil a new record for the Northern region (Amazonas State) was published by Costa *et al.* (2017).

Distribution in Argentina.— *Lejeunea capensis* is known from the provinces of Salta (departments Orán and Capital: Quebrada San Lorenzo) including the type locality of *Lejeunea clavatiflora*, and Jujuy (Dpto. Capital: Termas de Reyes) (Reiner-Drehwald & Schäfer-Verwimp, 2008). We report here the presence of *L. capensis* in Tucumán province, at several places in the Chaco Serrano (according to biogeographic scheme proposed by Ayarde, 2018). It was growing as epiphyte on *Allophylus edulis* (A. St.-Hil., A. Juss. & Cambess.) Hieron. ex Niederl. (local name: chal-chal), *Vachellia caven* (Molina) Seigler & Ebinger (tusca) and *Salix humboldtiana* Willd. (sauce), mixed with *Frullania* sp., and *Acanthocoleus aberrans* var. *laevis* Gradst.

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