



Cololejeunea tamasii (Lejeuneaceae, Marchantiophyta), a new species from Panama

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Abstract

Cololejeunea tamasii is described from Chiriqui province in western Panama. It is characterized by its small size, suborbicular to short oval leaf lobes with crenulate margins and papillose leaf cells as well as by its constantly reduced lobules of two cells.

Key words: *Cololejeunea*, Central America, liverworts

Introduction

The first liverwort checklist for Panama was provided by Stotler *et al.* (1998), and some additions were published by Dauphin *et al.* (2006), raising the number of liverworts to 325 taxa in 100 genera and 28 families. Compared to the 582 liverwort taxa in the neighbouring state Costa Rica (Dauphin 2005), it is obvious that the liverwort flora of Panama is still incompletely known. In the genus *Cololejeunea* (Spruce 1884: 291) Schiffner (1893: 121) represented in Panama with 15 species, two new species were recently described, *C. dauphinii* Zhu (2006: 277) (as *C. tixieri* by Morales & Dauphin 1998: 133) and *C. panamensis* Dauphin & Pócs in Dauphin *et al.* (2006: 76). *Cololejeunea* is here defined as including *Aphanolejeunea* Evans (1911: 272) as discussed by Wilson *et al.* (2007). The current paper describes an additional new species, which was discovered during a two-week stay in Panama in 2010.

Cololejeunea tamasii Schäfer-Verwimp *sp. nov.* (Fig. 1)

The new species is characterized by its suborbicular leaf lobes, crenulate-denticulate lobe margins, the rough dorsal surface of the leaf lobes and the two-celled lobule. This combination of characters is quite distinct and separates it from all congeners.

Type:—PANAMA. Chiriqui: Cordillera de Talamanca, Boquete, Ostseite des Vulkan Baru, Regenwald entlang der Erdstraße zum Sendero Los Quetzales, epiphyll, 1880 m, 8°51.0'N, 82°29.9'W, 7 April 2010, A. Schäfer-Verwimp & I. Verwimp 30992 (holotype JE!; isotype EGR!).

Small and delicate whitish green plants growing as scattered shoots on living or dead fern fronds, tightly appressed to substrate, with leaves (500–)540–750 µm wide. Stems 2–5(–7) mm long, in lower part of plant 30–40 µm, increasing further upwards to (40–)50–60 µm in diameter, composed of one medullary and 5 cortical rows of cells of which one forms the ventral merophyte; the cortical cells rectangular, the largest ones reaching 20–30 × 60–80 µm; very rarely branched (only one small branch seen, shorter than leaves of main shoot), branches of the *Lejeunea*-type; rhizoids abundant, fasciculate, hyalin. Leaves usually contiguous to slightly imbricate, more rarely somewhat distant, obliquely spreading, often weakly so and nearly at an angle of 90° to the stem, suborbicular to broadly ovate, with rounded to (more rarely) slightly acute apex, to (340–)375–420(–450) µm long and (300–)340–380(–405) µm wide, plane, the bases rounded, the antical base

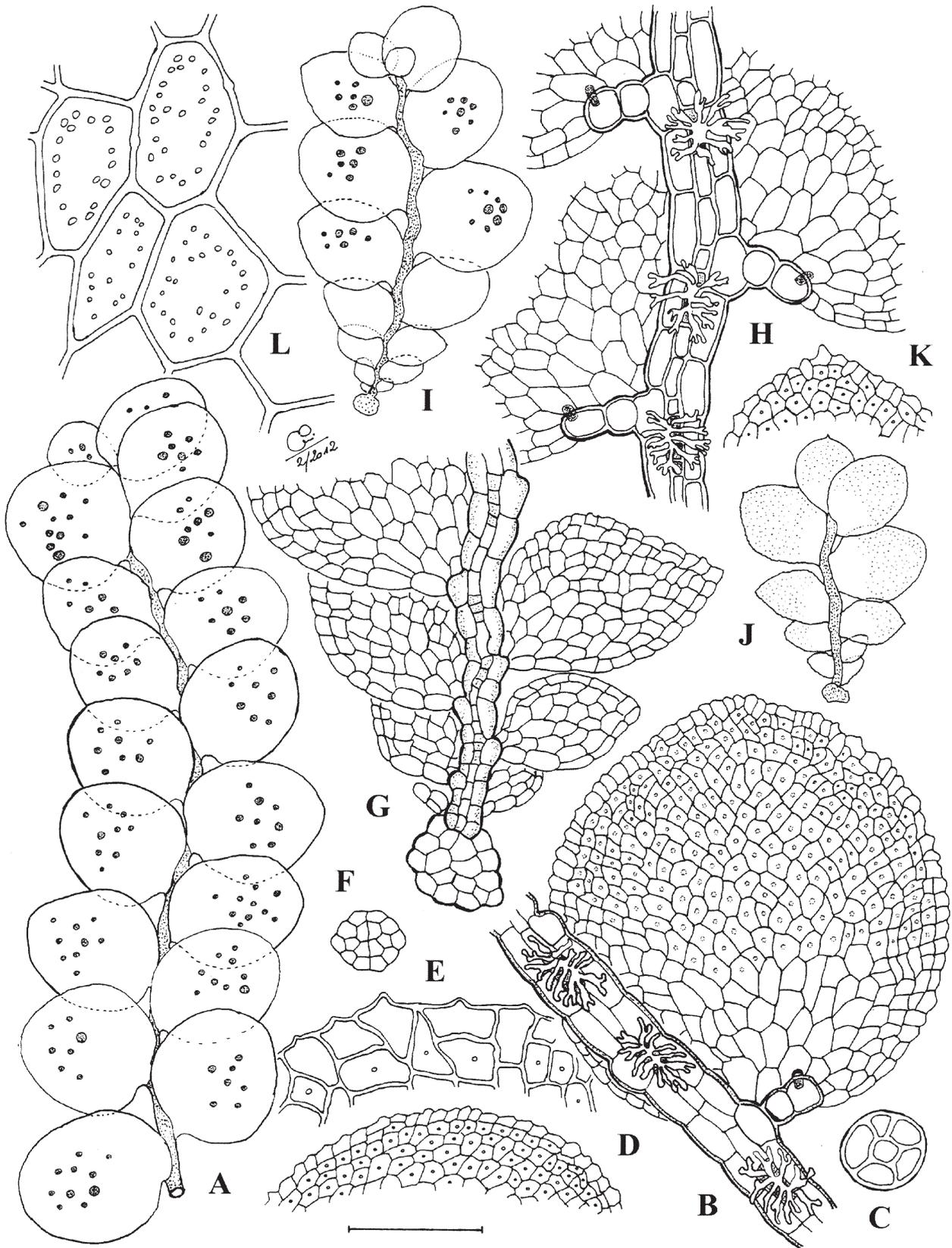


FIGURE 1. *Cololejeunea tamasii* Schäfer-Verwimp. A. Plant in dorsal view, with gemmae. B. Part of stem with leaf lobe and lobule, ventral view. C. Cross section of stem, 50 µm in diameter. D, E. Upper marginal cells of leaf lobe. F. Gemma. G. First leaves of a plant arising from gemma, ventral view. H. Detail of stem in ventral view, with rhizoides and lower part of leaf lobes with lobules and hyaline papillae. I. Young plant, ventral view. J. Young plant, dorsal view. K. Detail of uppermost leaf of plant. L. Lower central leaf cells with oil bodies. Scale: A = 350 µm, B, D, F, G, H, K = 100 µm, C = 75 µm, E = 40 µm, I, J = 400 µm, L = 20 µm. All figures drawn by the author (all from the holotype).

partly to completely covering the stem; the first 3–5 developed leaves always reduced, the first one sometimes to a few cells, and without lobules; lobe surfaces in upper 2/3–4/5 rough and margins irregularly crenulate-denticulate from conically protuberant cells except at lobe base; lobe cells varying in shape and size, continuously decreasing in size from base to central lobe and margin, the basal cells 5–6-angular and up to $30 \times 60 \mu\text{m}$ (in some leaves the largest basal cells ocelli like), median cells in the same shape than basal cells, $10\text{--}20 \times 18\text{--}28 \mu\text{m}$, marginal cells very irregular in shape (triangular, square, rectangular or asymmetrically 4–5-angular, the smallest about $8 \times 10 \mu\text{m}$, the cells in central and basal part often with small trigones and rarely with indistinct intermediate thickenings. Lobule seemingly always reduced to two cells, $30 \times 50 \mu\text{m}$, the distal cell crowned by the hyaline papilla which is about $6 \times 10 \mu\text{m}$. Style obviously lacking. Oil bodies numerous, 10–20 or more per cell, small, $1\text{--}1.5 \times 1.5\text{--}2 \mu\text{m}$ with somewhat roughened, not glistening surface. Discoid gemmae abundant on dorsal and ventral leaf surfaces, the well-developed ones more or less 6-angular, consisting of 16–18(–20) cells, each $8\text{--}10 \times 8\text{--}12 \mu\text{m}$, and reaching up to $(70\text{--})80 \times 90\text{--}100 \mu\text{m}$; most of the gemmae seen still in initial stages of development. Gynoecia and androecia not seen.

Etymology:—The species epithet is dedicated to Dr. Tamás Pócs from Eger, Hungary, outstanding bryologist and an expert on epiphyllous Lejeuneaceae.

Ecology and distribution:—*Cololejeunea tamasii* is known only from the type collection, at a roadside within a protected area of lower montane rain forest where secondary woody vegetation was dominant. The plants were growing epiphyllous on leaves of shrubs in a humid environment, half exposed to sunlight and therefore drying up periodically. The type locality itself may be destroyed in the near future as woody vegetation along the road is cleared periodically. However, as a pioneer species *C. tamasii*, though easily overlooked due to its small size, may possibly be found at similar sites elsewhere in Panama or Central America.

Discussion

Fertile structures have not yet been observed in *Cololejeunea tamasii*. However, the sterile gametophytes with suborbicular leaf lobes, crenulate-denticulate lobe margins, rough dorsal leaf lobe surfaces and the two-celled lobules, clearly separate it from related species. Although sterile, its small size with papillose lobe cells and denticulate lobe margins suggests an affiliation to *Cololejeunea* subg. *Cololejeunea*; however, considering its growth form (tightly appressed to substrate) and its pale to whitish green color, there is also some resemblance to *C.* subg. *Leptocolea* (Spruce 1884: 292) Schiffner (1893: 122). In fact, these two subgenera are morphologically weakly separated (Schuster 1963), the segregation is mainly based on the shape of the perianth, being not or weakly dorsiventrally compressed in *C.* subg. *Cololejeunea*, but more or less dorsiventrally compressed in *C.* subg. *Leptocolea*. However, the perianths are still unknown in *C. tamasii*. The morphologically most similar Neotropical species may be *Cololejeunea linopteroides* Robinson (1964: 457), which is characterized by suborbicular to broadly ovate leaf lobes and reduced lobules. However, this species differs from *C. tamasii* by its flat, ribbon-like stems and smooth, sigmoid leaf cells. Furthermore, the lobule in *C. linopteroides* is reduced to one cell, whereas the lobules of *C. tamasii* constantly consist of two cells. Other species with similar leaf lobes, e.g., the Central American *C. standleyi* Herzog (1951: 172) or the Asian *C. ceratilobula* (Chen 1955: 49) Schuster (1963: 179), have either well developed lobules, smooth (and partly sinuose) leaf cells or hyaline marginal cells, and are usually larger plants.

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