

## A new species of *Cololejeunea* (Lejeuneaceae: Cololejeuneoideae) from Panama

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**Abstract:** A new species of *Cololejeunea* section *Protocolea*, is described from Cerro Fábrega in Panama. The diagnostic characteristics of *C. tixierii* are lobes ovate-lanceolate, lobules never inflate but explanate or folded without forming a keel, reaching about half of the lobe length and perianth only faintly keeled at maturity.

In 1995, the junior author collected a species of *Cololejeunea* in Cerro Fábrega, Panama, at 3335 m altitude; the plant grew on soil, among other liverworts. The characteristics of the plant coincide with those of section *Protocolea* (Schuster 1963, 1980): leaves smooth-celled without hyaline border, lobules pluricellular, at least 0.3 the lobe length, gemmae lacking adhesive cells, and perianth 5-keeled. However, it differs from all the species of *Cololejeunea* section *Protocolea* (e.g. Schuster 1980, Tixier 1991) in the following features: 1) elobulate leaves are very rare. 2) the lobe is ovate-lanceolate, tapering to the 1-2

celled apex. 3) the lobule is flattened against the lobe or explanate, never saccate. The species is named in remembrance of the French hepaticologist, Dr. P. Tixier, who recently died.

*Cololejeunea tixierii* M. I. Morales & G. Dauphin *sp. nov.* *Cololejeunea minutissima* subspecies *myriocarpa affinis*, sed *plantae usque 1.2 mm latae; foliis ovati-lanceolatis, cellulis 40 x 23 µm et lobulis non inflatis, 0.5-0.6plo praeipue differt.*

Type: "Terrestre, a la sombra, asociada con

*Plagiochila* sp.”, PANAMA, Provincia de Bocas del Toro, Parque Internacional La Amistad, Cima del Cerro Fábrega, 9° 07 '05" N, 82° 52' 40" W, 3335 m, G. Dauphin, R. León & S. Matarrita 1556 (holotype USJ 47774; isotypes INB, PMA).

Plants pale green, 0.7-1.2 mm wide, on soil among other liverworts. Main stems up to 0.1 mm wide, scarcely branched, branches thecal, perpendicular to stem (Figure 4). Leaves distant, attached to the stem at an angle of 35° (Figure 8). Lobe ovate-lanceolate, averaging 500  $\mu$ m long and 260  $\mu$ m wide; attached dorsally by 3-4 cells and ventrally by 1-2 cells; antical margin arched over the stem, crenulate by protruding cells, postical border forming a right angle with the ventral surface of stem and then abruptly straight to the apex, border crenulate by protruding cells (Figure 1). Stylus unicellular. Lobe cells smooth, 31-54 x 18-32  $\mu$ m, averaging 40 x 23  $\mu$ m, thin walled, with small trigones and without intermediate thickenings; gemmae few, 24-25 celled, their margins crenulate, without adhesive cells, originating from the adaxial surface of the leaves (Figure 3). Lobule present, trapezoidal, averaging 330 x 220  $\mu$ m, 0.5-0.6 the lobe length; orientation to leaf lobe variable: folded against lobe, perpendicular to it or coplanar with it; free margin flattened, lobule never saccate or even weakly inflated; keel ill-defined; sinus between lobule apex and basisopic lobe margin acute to obtuse.

Plants autoicous. Male branches lateral, with 6-8 imbricate perigonal bracts, bracts 1-2 androus (Figure 5). Female branches with one sterile innovation, perichaetial bracts resembling vegetative leaves but larger (650x380  $\mu$ m), widely squarrose at perianth maturity. Perianths obconical, long exserted, short beaked, about 320  $\mu$ m wide when well-developed, sharply 5-keeled to half of their length when immature (Figure 6), keels less evident at maturity. Spores faintly verruculose.

*Cololejeunea tixierii* can be easily separated from all other species of *Cololejeunea* section *Protocolea* by the shape and size of the lobe and the lobule nearly always consisting of a fold 0.5-0.6 of the lobe.

The species seems most closely related to *C. minutissima* subsp. *myriocarpa* but differs from

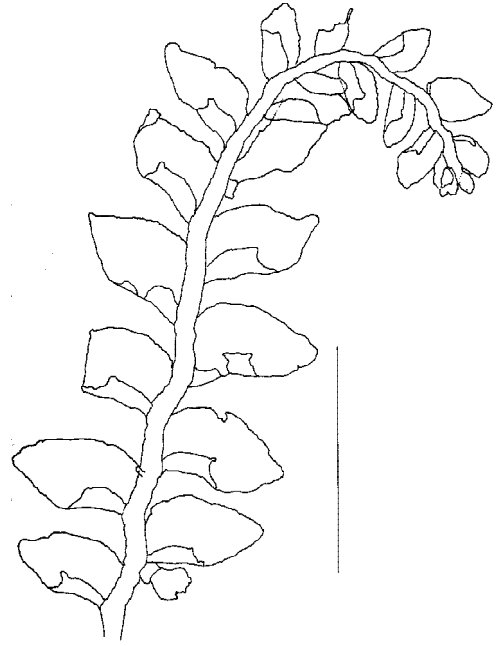
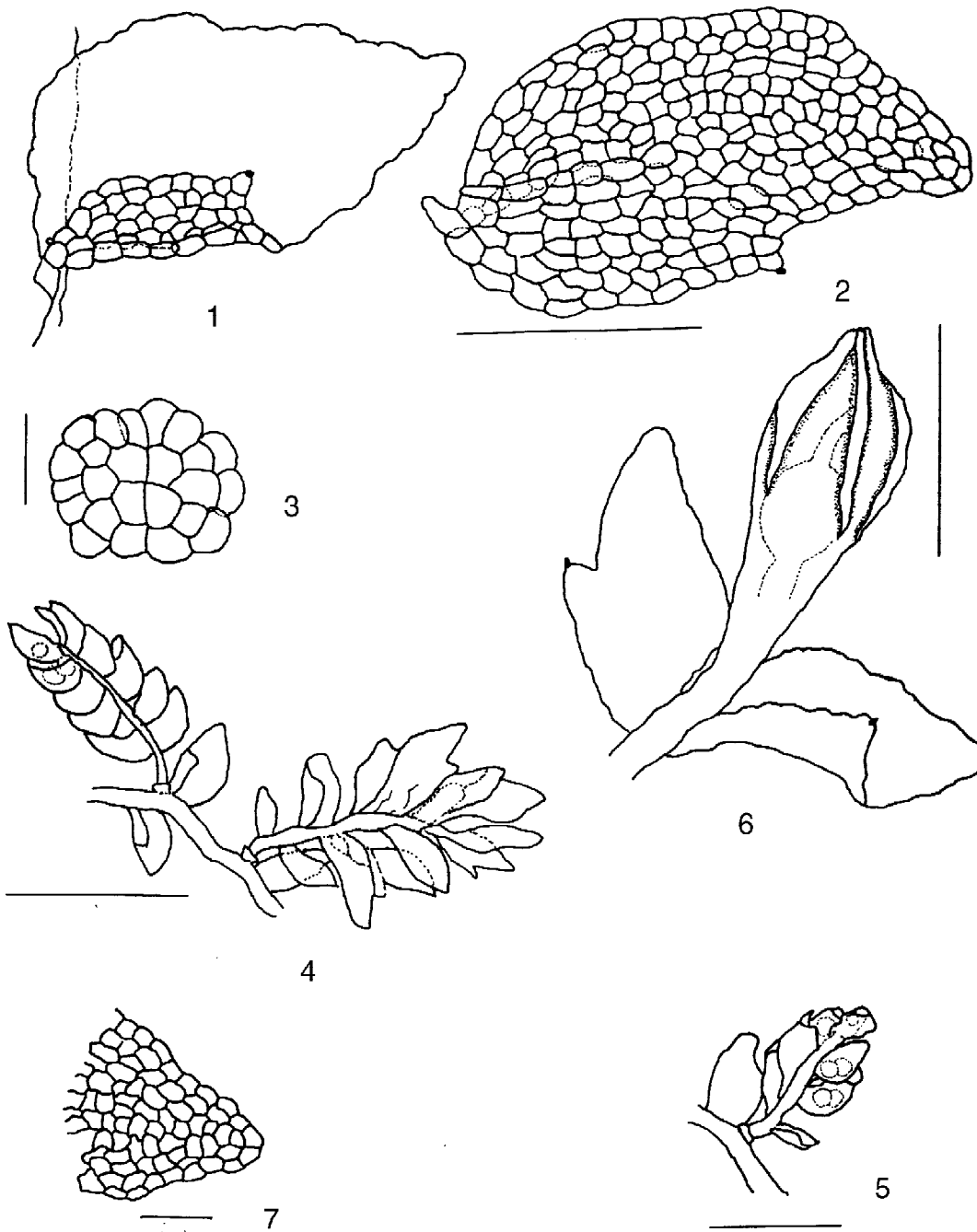


Figure 8: *Cololejeunea tixierii*. Habit. Scale = 1 mm.

the latter by:

- 1) its ovate-lanceolate leaves, differing from the ovate leaves of *C. minutissima* subsp. *myriocarpa* (Schuster 1980, Reiner-Drehwald 1994).
- 2) its larger size (0.7-1.2 mm wide), *C. minutissima* subsp. *myriocarpa* measuring up to 0.87 mm (Reiner-Drehwald 1994).
- 3) its larger leaf cells, 40 x 23  $\mu$ m vs. 16-19 x 18-22  $\mu$ m in *C. minutissima* subsp. *Myriocarpa* (Schuster 1980).
- 4) its always present lobule that never saccate, being a flat fold parallel to or forming an acute angle with the leaf plane, reaching 0.5-0.6 of the leaf length. In *C. minutissima* subsp. *myriocarpa* the lobule may be sometimes inflated (forming a sack) or lacking and showing an “ill-defined narrow indistinct fold” (Schuster 1980).
- 5) the gemmae, rarely formed, consist of 24-25 cells, while gemmae are frequent and composed of 15-21 cells in *C. minutissima* subsp. *myriocarpa* (Reiner-Drehwald 1994).
- 6) occurring in paramo habitat at 3335 m; *C. minutissima* subsp. *myriocarpa*, in contrast, seems to be a plant of lower altitude.



Figures 1-7: *Cololejeunea tixierii*. Figure 1. Leaf showing folded lobule. Figure 2. Leaf with extended lobule, ventral view. Scale 0.25 mm. Figure 3. Gemma. Scale 50  $\mu$ m. Figure 4. Plant with androecial and gynoecial branches. Scale 1 mm. Figure 5. Male branch. Scale 0.5 mm. Figure 6. Immature perianth with perichaetial bracts. Scale = 0.5 mm. Figure 7. Leaf apex. Scale = 250  $\mu$ m.

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