

*Frullania dulimensis* (Marchantiophyta: Frullaniaceae)  
from Costa Rica with perianths

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**Abstract:** Winter, G. & Schäfer-Verwimp, A. (2023): *Frullania dulimensis* (Marchantiophyta: Frullaniaceae) from Costa Rica with perianths. *Frahmia* **36**:1-6<sup>3</sup>.

The rare neotropical liverwort *Frullania dulimensis* has been detected for the first time with perianths in Costa Rica, representing the first record for Central America. So far, it was known from the type from Colombia and a second collection from Jamaica. Description and photographs of gynoecia and perianths are provided.

**Key words:** liverworts, new record, Central America



Fig. 1: Habitus of *Frullania dulimensis* – G. Winter 2961

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## 1. Introduction

*Frullania dulimensis* Uribe 2006 belongs to *Frullania* subgenus *Meteoriopsis* sect. *Meteoriopsis* Uribe, von Konrat et Hentschel (Hentschel et al. 2015) and is characterized by two large auricles at the dorsal and ventral leaf base similar in size, strongly convoluted leaves around the stem, three-keeled smooth perianth and pendent habit. It can be easily distinguished from all other members of this section by its unique dentate leaf margins. It seems to be very rare overall, as it became known only from four collections.

*Frullania dulimensis* is dioicous. The type specimen from Colombia represents a male population and the androecia were described and illustrated by Uribe (2006). Subsequently the species became known from a female population with young gynoecia from Jamaica, and here we provide description and photographs of fully grown gynoecia with well developed perianths from Costa Rica.

## 2. Description of gynoecia and perianth

**Gynoecia** terminal on strongly abbreviated branches along stem and branches, sometimes appearing nearly sessile; perichaetial leaves in 3-4 pairs, closely imbricate, usually appressed to the perianth when dry, apically slightly spreading and upper part of innermost bract pair spreading to recurved when moist, unequally bilobed.

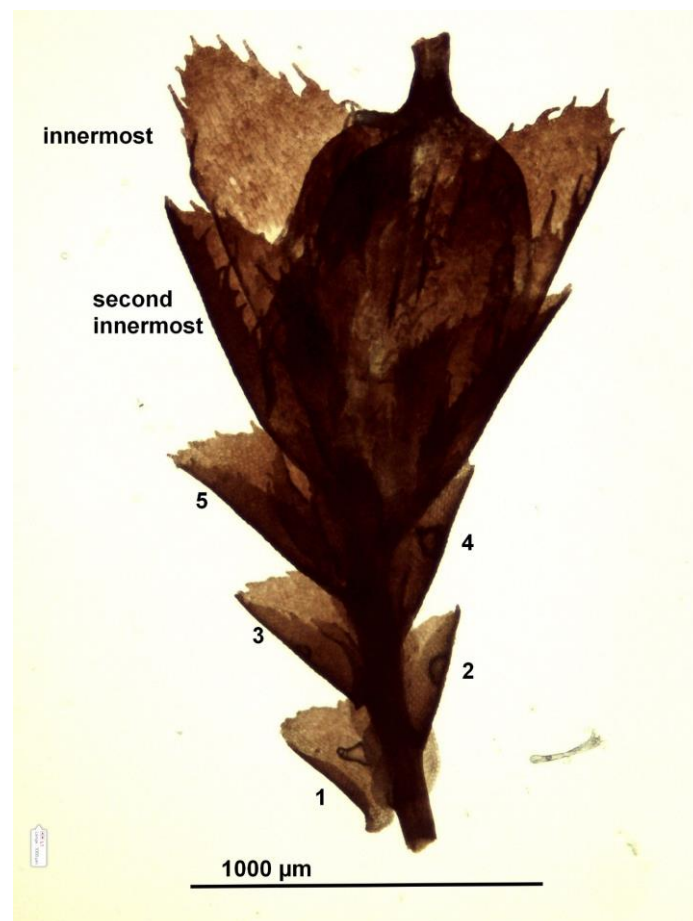


Fig. 2: Gynoecium – G. Winter 2961

**Innermost bract-lobe** ovate-elliptical to lanceolate, acute at apex, 1180-1510  $\mu\text{m}$  long, 480-580  $\mu\text{m}$  wide, narrowing to the base, widest above middle, ca 2-3x longer than wide, margin dentate-ciliate-laciniate, the lobule ovate-lanceolate, narrowing to the base, 860-1190  $\mu\text{m}$  long, 260-400  $\mu\text{m}$  wide, margin ciliate-laciniate, connate to lobe ca 0.4-0.5 lobule length; innermost pair of bracts free or connate up to 0.3 lobe length.

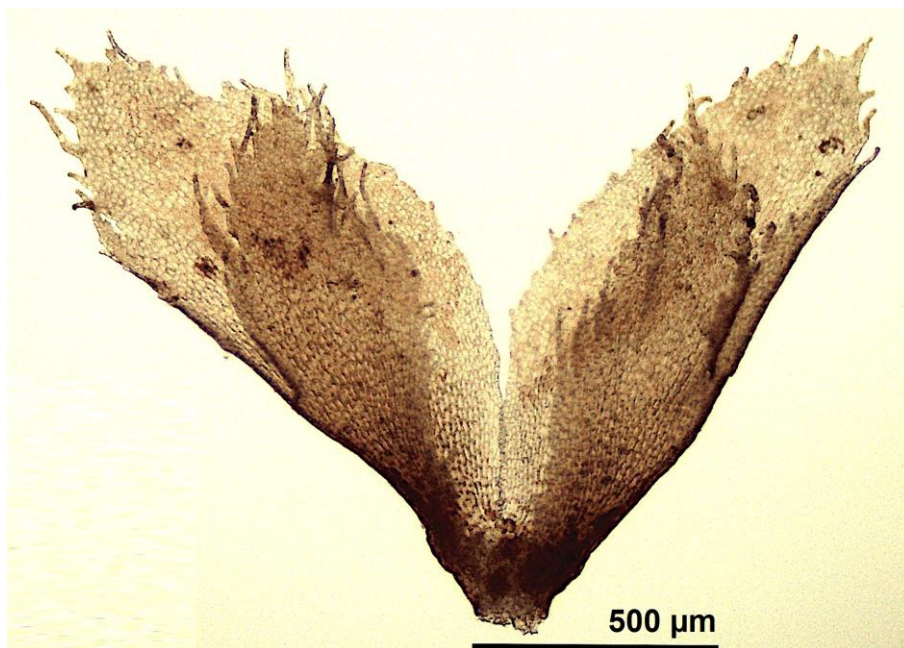


Fig. 3: Innermost pair of bracts – G. Winter 2966

**Innermost bracteole** free, ovate, ca 900-1200  $\mu\text{m}$  long, 550-635  $\mu\text{m}$  wide, bifid to (0.35-)0.4-0.5, sinus V-shaped to narrowly obtuse, the lobes triangular-lanceolate, acute-acuminate, strongly ciliate-laciniate, 600-650  $\mu\text{m}$  long and 280-350  $\mu\text{m}$  wide at base.

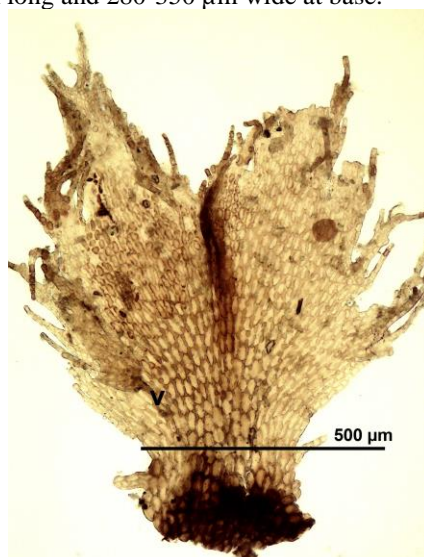


Fig. 4: Innermost bracteole – G. Winter 2966

**Cells of bracts and bracteoles** elongate, similar to those of leaf lobe, the walls sinuate, with strong nodulose trigones.

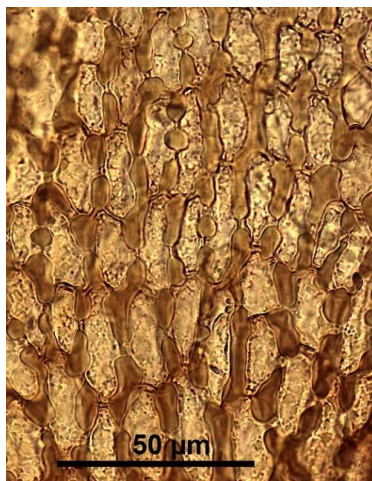


Fig. 5: Cells in the middle of the bract – G. Winter 2961

**Perianth** nearly cylindrical in outline, somewhat dorsi-ventrally flattened, 3-keeled with a prominent ventral keel, keels and surface smooth, exerted about 0.2-0.5 of its entire length,  $\pm 2$  mm long and 0.7(- 1.0) mm wide, narrowed to a  $\pm 0.3$  mm wide base, beak conspicuous, 200-220  $\mu\text{m}$  long, 80  $\mu\text{m}$  wide.



Fig. 6: Perianth dorsal view – G. Winter 2966



Fig. 7: Perianth ventral view – G. Winter 2966

### 3. Conclusions

*Frullania dulimensis* was so far known only from two collections.

It has been described from a male population in Colombia (Uribe 2006).

Type: **Colombia**, Tolima, Ibagué, Corregimiento Juntas, vía Boquerón, 3200 m. 27 mar 1986, *H. Esquivel* 3422 (holotype TOL1, Isotype COL).

No further specimens were cited though it was stated "Es una especie común en las faldas del nevado, en el límite entre el bosque andino y el páramo" (Uribe 2008).

Subsequently the species has been reported from a female population in Jamaica (Schäfer-Verwimp & van Melick 2016; Gradstein 2021).

**Jamaica**, St. Thomas, Blue Mountains, 2250 m, pendent from branchlets in elfin forest at summit region, Schäfer-Verwimp 35419, with H. van Melick (Herb. Schäfer-Verwimp [JE], Herb. van Melick, CAS, EGR, FR, GOET, HIRO, M, MO).

The following two collections from Costa Rica represent the first ones for Central America:

**Costa Rica**, San José: Mirador de Quetzales Lodge, Finca Eddie Serrano, Cerro de la Muerte Mountains, accessed from Carretera Interamericana Sur Kilómetro 70, around Albergue Mirador de Quetzales [9°38'36.2" N, 83°50'59" W], 2650 m, 5. March 2006, G. Winter 2961, 2966 [both c. per.] (FR, herb. Schäfer-Verwimp [JE]).

#### 4. Distribution and habitat

*Frullania dulimensis* is a northern Andean-Antillean-Central American species, now known from Colombia, Jamaica and Costa Rica. It seems to be restricted to montane cloud and elfin forests at altitudes between 2250 m in the Blue Mountains, the highest peak of Jamaica, and 3200 m in Colombia where it grows at the border of high andean forest and páramo vegetation. It is loosely pendent from branches of shrubs and trees, typical for members of *Frullania* subgenus *Meteoriopsis* sect. *Meteoriopsis*, preferring frequent occurrence of fog.

In the specimen from Jamaica (Schäfer-Verwimp 35419) some shoots of *Aptychella prolifera* (Broth.) Herzog, a very few plants of *Drepanolejeunea araucariae* Steph. as well as a species of *Usnea* were admixed. *Frullania convoluta*, *Acrobolbus antillanus* R.M.Schust., *Brachiolejeunea laxifolia* (Taylor) Schiffn., *Herbertus juniperoideus* (Sw.) Grolle and *Daltonia longifolia* Taylor were growing nearby.

In the Costa Rican specimen (G. Winter 2961) some plants of *Frullanoides densifolia* Raddi, *Frullania peruviana* Gottsche and *Frullania convoluta* Lindenb. et Hampe were found and a very few plants of *Drepanolejeunea lichenicola* (Spruce) Steph. were creeping on *F. dulimensis* (G. Winter 2966).

#### 5. Acknowledgments

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