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## *Cryphaea hortonae*, a new species of mosses from Bolivia

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**Abstract.** *Cryphaea hortonae* Y. León. is described as new from Bolivia. It is next related to *C. filiformis* but differs by the leaf shape and the length of the awn of their perichaetial leaves.

### Introduction

While working on the revision of the genus *Cryphaea* Mohr. for the northern Andes, an apparently undescribed species was found amongst specimens from Bolivia.

Even though there have been more than 20 species described from the northern Andes, all of them fall into 5 species (León, 1995). *Cryphaea hortonae* is very distinct from the other species (*C. boliviana* Sch. ex Britt. *C. jamesoni* Tayl., *C. pilifera* Mitt., *C. ramosa* (Mitt.) Wils., *C. polycarpa*, Schimp. ex Besch.) by the capsules surrounded by perichaetial leaves ending in a short apiculus.

The species closest related to *C. hortonae* seems to be *Cryphaea filiformis* which is distributed in the Caribbean, coastal South America, Central America and Southern Florida (Manuel, 1973; 1981). This type of distribution suggests dispersal via the Caribbean arc (Delgadillo, 1990) (Leon, 1995), while *C. hortonae* seems to be endemic for the province of Inquisivi in Bolivia.

The two species have perichaetial leaves with prurlose cells at the shoulders. However, *C. filiformis* differs from *C. hortonae* in the length of the awn of the perichaetial leaves and in the different shapes of the leaf apex. *Cryphaea hortonae* has vegetative leaves with a rounded apex, while *C. filiformis* has an acute apex. The spores are very densely papillose similar to those of *C. filiformis*.

From the material from South America and other material from North America, Africa, Europe and Japan it seems that the species within the genus *Cryphaea* can be arranged into two groups.

One group includes *C. jamesoni*, *C. pilifera*, *C. ramosa*, *C. polycarpa*, (Andes), *C. tenella*, (Southern South America), *C. attenuata* (Central America). It is characterized by ovate-lanceolate vegetative leaves and a costa ending in one elongated cell. Perichaetial leaves with all cells smooth and elongated and ending in a piliferous awn.

The other group includes *C. glomerata* (North

America), *C. filiformis* (Caribbean), *C. heteromalla* (North America and Europe), *C. obvatocarpa* (Japan), *C. hortonae* (Bolivia) *C. leucocoleum* (Uruguay). The species in this group have ovate leaves with the apex ending at right angle or rounded, costa ending in two rows of rounded or ovate cells, perichaetial leaves with or without prorula, ovate upper cells, piliferous or apiculose awns.

***Cryphaea hortonae* Y. León sp. nov. (fig. 1,2)**

Plantae obscure virides caule primarii repente, caule secundarii ramosi 3-5 cm longi. Folia imbricata, ovata, concava, plerumque 1.5-2 mm longa x 0.8-1 mm lata apicibus obtusis, nervis ultra medium evanidis marginibus usque ad acuminem planis et integris. Cellulae foliorum ovatae, versus acuminem 8-14 x 5-6  $\mu\text{m}$  juxta costam ovate-oblongae, plerumque 18-20 x 5-6  $\mu\text{m}$ , ad basim lineares 20-28 x 5-6  $\mu\text{m}$ . Cellulae parietibus modeste papillosis. Autoica; Folia perigonalia parva, ovata, 0.8 mm x 1 mm apicibus rotundis, acostatis. Cellulibus rhomboideis 22-24 x 3-6  $\mu\text{m}$ , laevibus.

Folia perichaetialia interna elongata, oblonga spathulate obtusa, 3-3.5 mm x 1 mm, nervo percurrente, acumine piliforme brevi. Capsula immersa, Calyptra cucullata, papillosa. Peristomium duplex dentibus exostomii et endostomii cum papillis valde grandibus. Sporae virides, granulosaе, 28-30  $\mu\text{m}$ .

Plants 3-5 cm long, corticolous, unipinnate. Foliose pseudoparaphyllia present on stems. Stem leaves concave, spreading when wet and patent when dry. Ovate to oval-lanceolate, 1-2 mm long and 0.6-1 mm wide. Apex rounded or acute ending in a right angle. Margin plane, entire. Costa present, single to forked, extending to midleaf, with upper cells linear, 30-36  $\mu\text{m}$  long. Upper cells ovate 8-14 x 5-6  $\mu\text{m}$ , cells close to the costa ovate-elongate, 18-20 x 5-6  $\mu\text{m}$ . Basal cells linear-sinuose 20-28 x 5-6  $\mu\text{m}$ . Cell walls thickened to nodose at the base, prorate.

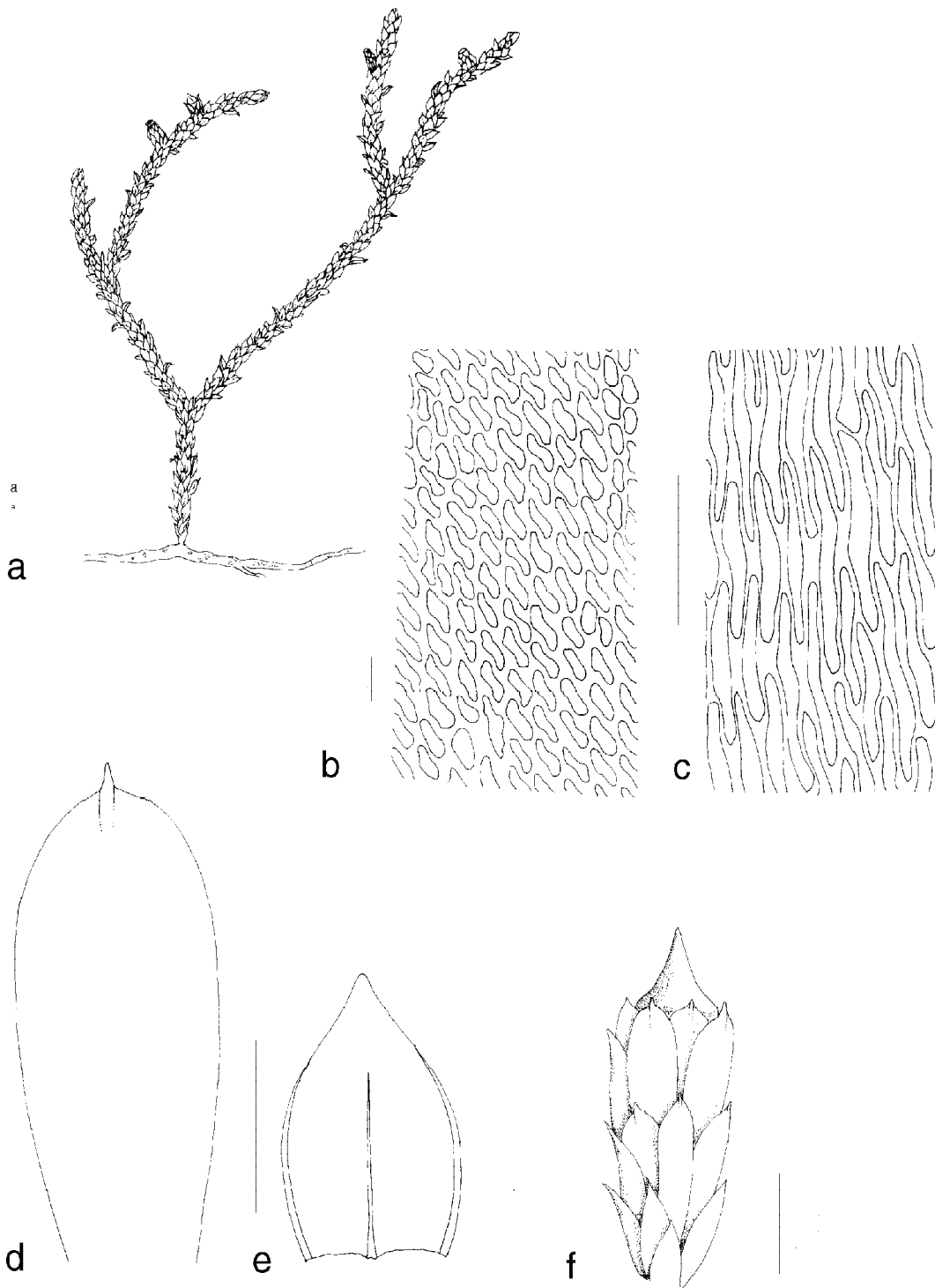
Branch leaves similar in shape to stem leaves but smaller, concave, spreading when wet and patent when dry. Cell sizes similar to those of the

stem leaves. Prorula present, cell walls thickened, bulging. Plants autoicous, with perigonia and perichaetia on stems. Perigonial leaves ovate, 0.8 mm x 1 mm with apex rounded, costa absent. Margin plane, entire. Cells sinuose, 22-24 x 3-6  $\mu\text{m}$ , smooth. Perichaetial post-fertilization leaves spathulate, 3-3.5 x 1 mm. Apex acuminate, costa excurrent, ending in a short apicule. Margin entire sometimes revolute. Cells homogenous throughout the leaf, linear-sigmoidal 30-80 x 3-6  $\mu\text{m}$ , smooth. Capsule lineal-ovate 2 x 0.7 mm, translucent. Exothecial cells variable; rectangular to pentagonal 40-90 x 15-26  $\mu\text{m}$  with thin walls. Cells of the mouth rectangular, 10-12 x 5-6  $\mu\text{m}$ . Peristome double, teeth triangular tapering gradually, 0.6-0.8 mm long, densely papillose. Endostome complete with a low basal membrane, segments as long as the teeth, densely papillose. Operculum beaked, 0.5-0.6 mm long. Calyptra cucullate, papillose. Spores rounded, green 28-30  $\mu\text{m}$ , granulate with thick walls.

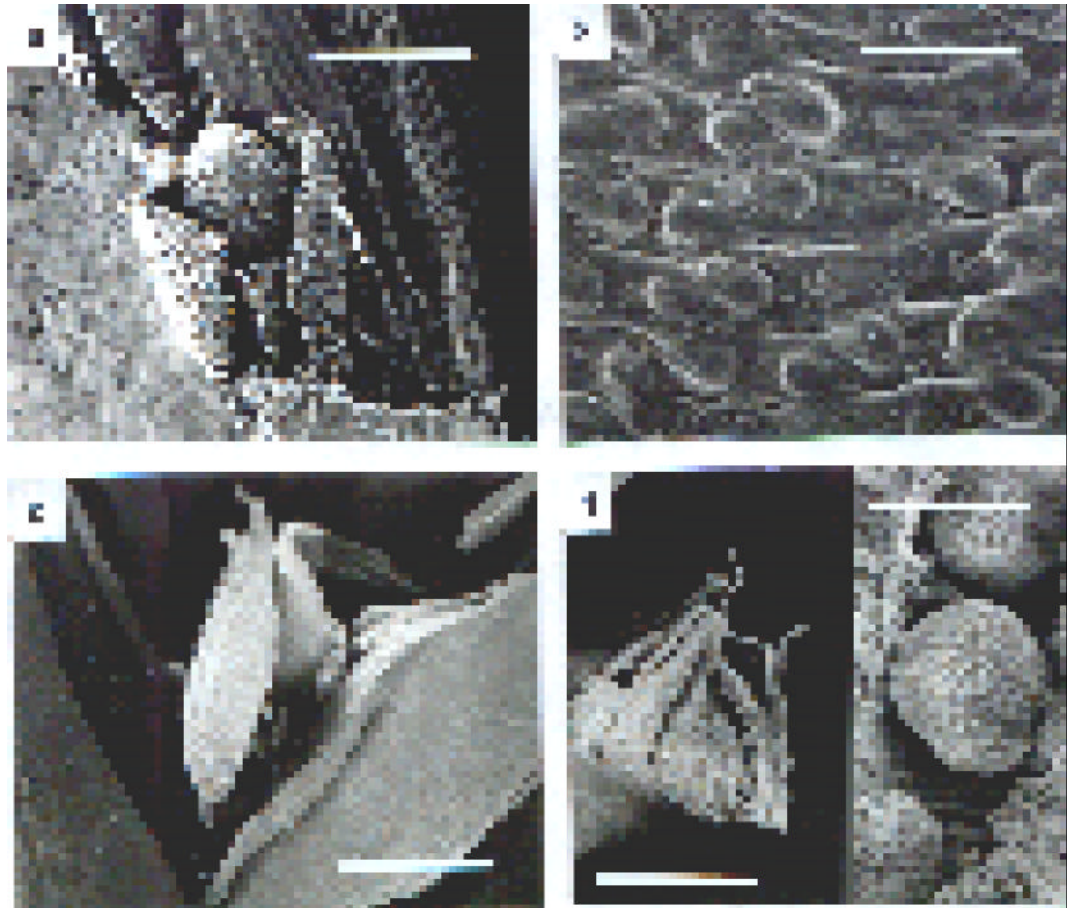
This species is dedicated to Dr. Diana Horton to whom I am very grateful.

Holotype: Bolivia: Dpto. La Paz Prov. Inquisivi: Pavionani. Headquarters of Rio Chimú. Area of ultimate trees which are scattered amongst grassland on boulder piles and at the bases of cliffs. Rocks are black metamorphic. Seasonally super humid and frequently foggy. *Weinmania*, *Gynoxis*, *Berberis*, *Miconia* woodlands. On twigs and small branchlets ca. 3750 m. Lewis 38568 d-1 (MO).

Paratypes: Lewis 87673, Bolivia. Dpto. La Paz. Prov. Inquisivi, Rio Glorieta, ca 8 km NW of Quime 3200-3400 m. 67° 17' W; 16° 57' S, Lewis 87595 (mixed with *C. pilifera*) (MO)



**Fig. 1.** *Cryphaea hortonae* - **a.** Habit. - **b.** Upper vegetative leaf cells. (scale 8  $\mu$ m) - **c.** Perichaetial leaf cells (scale 20  $\mu$ m) - **d.** Perichaetial leaf - **e.** Leaf (scale 1mm) - **f.** Sporophyte (scale 1 mm)



**Fig. 2.** - SEM pictures of *Cryphaea hortonae*. **a.** Pseudoparaphyllia (scale 75  $\mu\text{m}$ ). - **b.** Cells of vegetative leaf (scale 10  $\mu\text{m}$ ). - **c.** Perigonial leaves (scale 200  $\mu\text{m}$ ). - **d.** Peristome (scale 231  $\mu\text{m}$ ) **f,** Spores (scale 30  $\mu\text{m}$ ).

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