

First record of the genus *Everniastrum* Sipman (Parmeliaceae, lichenized Ascomycota) for the state of Paraná, Brazil

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ABSTRACT

Everniastrum is a pantropical genus that has been recorded for the Brazilian states of Minas Gerais, Rio de Janeiro, São Paulo and Rio Grande do Sul. In this work, we present the first records of *E. cirrhatum* and *E. vexans* for the Brazilian state of Paraná. Comments and illustrations are provided.

Key words: lichenized Ascomycota, lichens, Mycota, upper montane rain forest

Everniastrum Sipman occurs in tropical mountain areas (Hale 1976, Sipman 1980), usually on bryophytes and in humid localities where mist and rain prevail for most of the year (Sipman 1980). It is a pantropical genus with centers of speciation in Asia, Central America and South America (Elix 1993), occurring mainly in Mexico and in the central Andes region, specifically in Ecuador and Peru (Sipman 1986).

The oldest known reference to this genus in Brazil is from Culberson & Culberson (1981), who mentioned *E. cirrhatum* (Fr.) Sipman for the mountainous region of the state of Rio de Janeiro. The genus is also known to occur in the states of Minas Gerais and São Paulo (Ribeiro 1998), as well as in the state of Rio Grande do Sul (Fleig 1985).

In the present study, we provide the first record of the genus for the state of Paraná, where we identified two species: *E. cirrhatum* and *E. vexans* (W.L. Culb. & C.F. Culb.) Sipman.

We collected specimens during lichenological expeditions to Caratuva Peak, near the municipality of Antonina, which is in the Serra do Mar coastal mountain range, in the state of Paraná, at an elevation of 1850 m. The specimens were preserved and deposited in the Herbarium of the Botany Department of the Federal University of Paraná (code, UPCB). The morphological and anatomical analyses were performed according to Gerlach & Eliasaro (2012). For the identification of secondary metabolites, we employed coloration tests of the cortex and medulla (Taylor 1967,

1968), together with thin layer chromatography (Culberson & Ammann 1979; Elix & Ernst-Russell 1993).

Everniastrum cirrhatum (Fr.) Sipman, Mycotaxon 26: 237. 1986.

≡ *Parmelia cirrhata* Fr., Syst. Orb. Veg. (Lundae) 1: 283. 1825. Fig. 1A and 1B

Description: Sipman (1980) and Yáñez-Ayabaca (2009).

Coloration tests: upper cortex, K+ yellow; medulla, K+ yellow → red, C– and KC–.

Substances of taxonomic value detected by thin layer chromatography: atranorin, salazinic acid and a non-identified fatty acid with an $R_f \approx 47$.

Everniastrum cirrhatum can be recognized by the absence of propagules and the presence of salazinic acid in the medulla. In the specimen analyzed, the conidia were bifusiform, measuring $5.0-5.5 (-6.0) \times 1.0 \mu\text{m}$, similar to those described by Ribeiro (1998) and Yáñez-Ayabaca (2009), who reported *E. cirrhatum* conidia measuring $5.0-6.0 \times 1.0 \mu\text{m}$ and $5.0-5.5 (-6.0) \times 0.8 \mu\text{m}$, respectively. Culberson & Culberson (1981) and Sipman (1980), however, described the conidia of this genus as bacilliform to short filiform, measuring $5.0-7.0 \times < 1.0 \mu\text{m}$ and $6.0-7.0 \times 0.5 \mu\text{m}$, respectively. The lobes of the specimen analyzed here measured 0.5-1.5 mm, slightly narrower than those described by Sipman (1980) and Yáñez-Ayabaca (2009), who reported lobe widths of 0.8-2.0 (-3.0) mm and (0.7-)

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Figure 1. *Everniastrum cirrhatum* (Fr.) Sipman (A. Gerlach et al. 725). A) *E. cirrhatum* in the field. B) *E. cirrhatum* in the laboratory. (Scale bar = 1 cm)

1.0-2.6 mm, respectively. Although both of those authors mentioned the presence of numerous apothecia in the material examined, those structures were not observed in the specimen evaluated in the present study.

Although *Everniastrum cirrhatum* is not well known in Brazil, Osorio & Fleig (1986) stated that the species is likely undersampled and probably widely distributed in the mountainous regions of Brazil. *Everniastrum cirrhatum* is corticolous and occurs together with *E. vexans* on humid slopes among bryophytes.

Distribution: Widely distributed in Asia, Africa and the Americas (Sipman 1980). In South America, it is cited for Argentina, Colombia, Peru and Venezuela (Sipman 1980); for Bolivia (Feuerer et al. 1998); and for Chile and Ecuador (Culberson & Culberson 1981). In Brazil, it occurs in the states of Rio de Janeiro (Culberson & Culberson 1981), Rio Grande do Sul (Fleig 1985) and São Paulo (Ribeiro 1998).
Material examined: BRAZIL. Paraná: Antonina, Pico Caratuva, 06/VII/2011, A. Gerlach et al. 725.

Everniastrum vexans (W.L. Culb. & C.F. Culb.) Sipman, Mycotaxon 26: 242. 1986.
 ≡ *Cetrariastrum vexans* W.L. Culb. & C.F. Culb., Bryologist 84(3): 294. 1981.

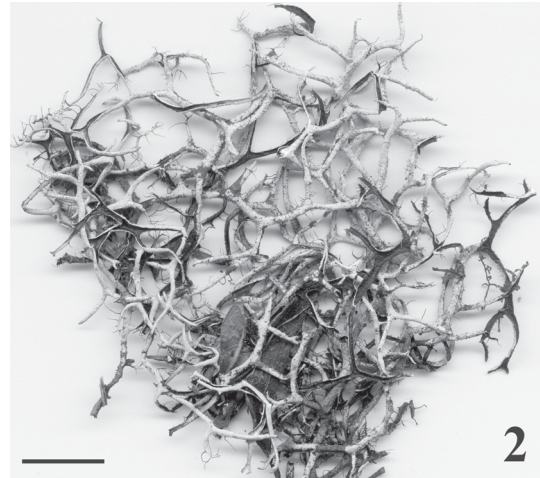


Figure 2. *Everniastrum vexans* (W.L. Culb. & C.F. Culb.) Sipman (A. Gerlach et al. 687). (Scale bar = 1 cm)

Fig. 2

Description: Sipman (1980) and Yáñez-Ayabaca (2009).

Coloration tests: upper cortex, K+ yellow; medulla, K+ yellow → red, C- and KC-.

Substances of taxonomic value detected by thin layer chromatography: atranorin and salazinic acid.

Everniastrum vexans can be differentiated from *E. cirrhatum* basically by the presence of isidia. Like *E. cirrhatum*, *E. vexans* has abundant cilia, ranging from simple to bifurcate, 1.0-3.0 mm in length, which are referred to as marginal rhizines by Culberson & Culberson (1981) and as cilia by Sipman (1980).

Culberson & Culberson (1981) and Yáñez-Ayabaca (2009) described *E. vexans* lobes as measuring 0.5-2.0 mm. However, in the material analyzed here, the lobes were narrower (≤ 1.5 mm in width), similar to those described by Sipman (1980), who reported a lobe width of 0.7-1.0 (-2.5) mm.

The species was found among bryophytes on a humid slope, together with other lichenized fungi: *Cladia aggregata* (Sw.) Nyl, *Cladonia* spp. and *Heterodermia* sp.

Distribution: Widely distributed in Asia, Africa and the Americas (Sipman 1980). In South America, it has been cited for Argentina (Culberson & Culberson 1981), as well as for Colombia, Ecuador and Venezuela (Sipman 1980). In Brazil, it occurs in the states of Minas Gerais and São Paulo (Ribeiro 1998), as well as in the state of Rio Grande do Sul (Fleig 1985).

Material examined: BRAZIL. Paraná: Antonina, Pico Caratuva, 06/VII/2011, A. Gerlach et al. 687.

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