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Schistidium cinclidodonteum (Müll.Hal.) B.Bremer (Grimmiaceae, Bryophyta) new to Macaronesia

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RESUMEN: Se cita *Schistidium cinclidodonteum* (Müll.Hal.) B.Bremer por primera vez para la región macaronésica, a partir de material recolectado en la isla

de Gran Canaria. Previamente solo se conocía de varias localidades del oeste de Norteamérica y de Marruecos.

PALABRAS CLAVE: *Schistidium cinclidodonteum* / musgos / islas Canarias.

ABSTRACT: *Schistidium cinclidodonteum* (Müll.Hal.) B.Bremer is reported for the first time in Macaronesia, from material collected in Gran Canaria island.

Previously it was known from some localities of western North America and Morocco.

KEYWORDS: *Schistidium cinclidodonteum* / mosses / Canary Islands

INTRODUCTION

Until now, the genus *Schistidium* (Grimmiaceae, Bryophyta) was represented in the Canary Islands by four species: *S. apocarpum* (Hedw.) Bruch & Schimp., *S. confertum* (Funk) Bruch & Schimp., *S. flaccidum* (De Not.) Ochyra and *S. frigidum* H.H.Blom (Losada Lima *et al.* 2010; Dirkse *et al.* 2018). On a bryological survey carried out by the first author of the summits of the island of Gran Canaria, a strange *Schistidium* growing on submerged rocks was found. The plants differ in many aspects from the species previously mentioned for the archipelago and the Euro-

pean continent, and appear to belong to *S. cinclidodonteum* (Müll.Hal.) B.Bremer. This we report as new to Macaronesia.

MATERIAL AND METHODS

The geographical position of collecting sites is given in UTM co-ordinates (Universal Transverse Mercator projection) as read from the Mapa Topográfico Nacional de España (MTN25), leaf 1104-111, Vega de San Mateo. In 1997 the positions have been taken from the 1:50.000 Mapa Militar de España, Telde. Positions are given for the lower left-hand corner of the 5x5 km UTM square in which the specimens have been found.

The plants were studied in KOH (2%). Microscopic measurements were taken with a camera lucida equipment. The collected material is kept in the private herbarium of the first author and in TFC-Bry.

RESULTS AND DISCUSSION

• Examined specimens

Gran Canaria, Canary Islands: between Cuevas Blancas and Embalse de Los Hornos, UTM 28R 440-3090, 1700 m a.s.l., small water course, G.M. Dirkse 1997, Herb. Dirkse No. 15316; Tejada, Parque Rural del Nublo, SE of Presa de los Hornos, UTM 28R 440-3090, 1650 m a.s.l., small streams, G.M. Dirkse & S.M.H. Hochstenbach 2010, Herb. Dirkse No. 26089.

• Description

Schistidium cinclidodonteum (Müll.Hal.) B.Bremer (Fig. 1)

Plants blackish green forming submersed tufts. Stem to 70 mm long, 0.2 mm in diameter, erect or prostrate, cross section with 3-4 layers of stereid-like cells with very thick, red-brown walls, gradually passing into about 10 layers of medullary cells with moderately thickened yellowish walls; central strand absent; rhizoids numerous from below leaf bases in lower part of stem, 10-25 µm wide, red-brown, smooth. Leaves evenly spaced, rather thick, secund when wet, tips recurved when dry, otherwise little altered, 3.5-5.0 x 0.9-1.2 mm, ovate-lanceolate, concave, not keeled, margin smooth, erect in upper half, flat or recurved at base, apex narrowly channelled, subulate, usually epilose, rarely with minu-

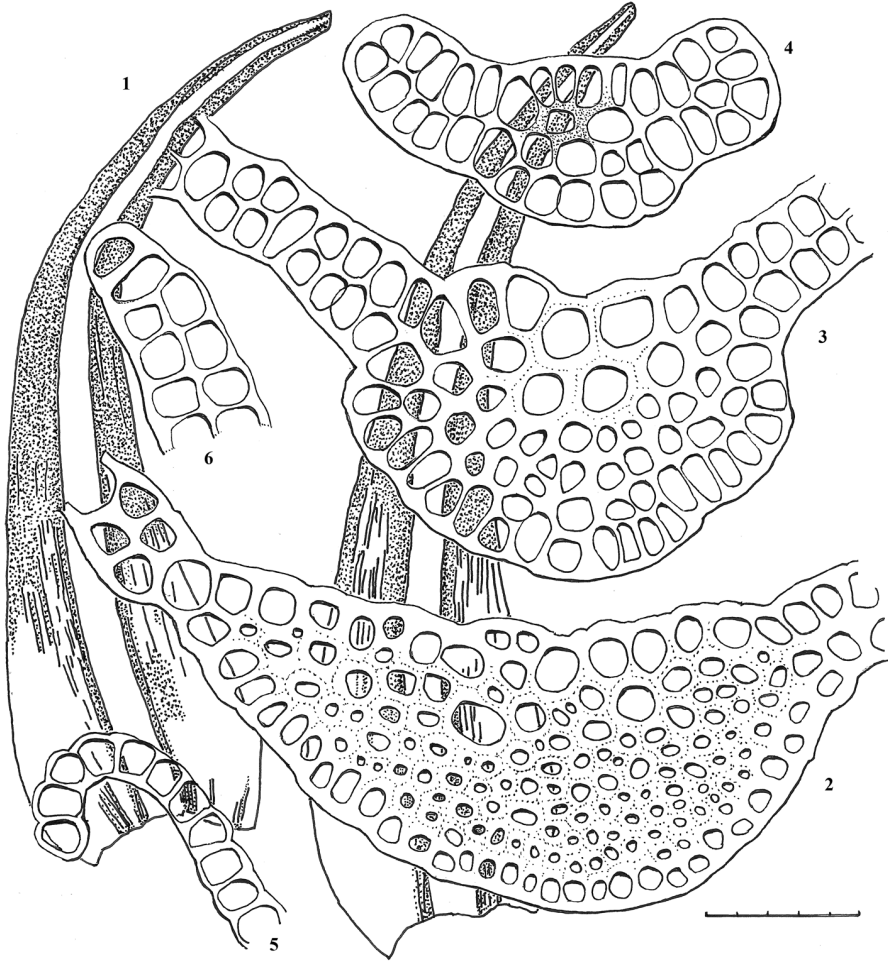


Figura 1. *Schistidium cinclidodonteum* (Müll.Hal.) B.Bremer. Vegetative leaves (1), cross sections of nerve (2, 3, 4) and leaf margin (5, 6, 4) from leaf base to top. Drawn from Herb. Dirkse No. 15317. Scale bar=50 μ m (details); 0,8 mm (leaves).

te papillose hyaline hair point; KOH reaction orange in mature parts; median cells quadrate-rectangular, on average 7-16 x 8-10 μm , walls thickened at edges, slightly sinuose towards leaf margins, 2-3 stratose in distal half of leaf and along costa, in proximal part of leaf with 2-stratose strips and patches; basal cells 20-32 rows, rectangular, 15-50 x 13-20 μm , walls moderately thickened, at extreme base and towards margin nodulose-sinuose, 1-stratose except for a 2-stratose, 6 cells wide strip near costa, alar cells quadrate, not differentiated; apical cell when discernible 10 μm long, 12 μm wide, blunt, forming blunt-denticulate, green or hyaline apex with other apical cells; nerve prominent at back, smooth, 150-170 μm wide near base, ending with apex, adaxial cells elongate in upper half, cross section with up to 4 adaxial layers of large epidermal cells, 5 layers of stereid-like small cells, and 1 layer of larger abaxial epidermal cells; axillary hairs about 8, in axils of younger leaves, 200-450 μm long, consisting of 7-16 cells, hyaline, to 4 basal cells short rectangular. Gemmae not observed. Autoicous. Gynoecia terminal, bracts concave, 1.8-3.5 x 0.7-1.1 mm, bistratose at apex, bistratose strips and patches in lower parts, inner bracts ovate, acute, costa ending in apex, epilose, outer bracts triangular, acuminate, epilose or with minute, papillose hyaline point, archegonia 0.6-0.7 mm long. Androecia bud-like, below perichaetia, bracts broadly triangular, 1.2-1.3 mm long, widely acute, epilose, costa ending below apex, antheridia 30-40, 0.5 mm long, paraphysa filamentous, 0.4-0.8 mm long, inconspicuous.

Sporophyte half enclosed by gynoecial bracts, calyptra cucullate, operculum 0.9-1.0 mm in diameter, rostrum 0.4 mm long, oblique, columella attached, seta 0.3 mm long, capsule cylindrical, 1.0-1.6 mm long, to 1.0 mm wide, exothecial cells irregular, quadrate-rectangular to hexagonal, 20-50 μm in longest dimension, thin-walled, stomata absent, peristome red, 350 μm long, erecto-patent or recurved, faintly papillose, perforated along lines in upper half. Spores 8-12 μm in diameter, brown to greenish, spherical or rounded rectangular-triangular.

- Ecology and distribution in Gran Canaria

Rare, but locally abundant in some streams in open pine forest in the Parque Rural del Nublo at 1600-1700 m a.s.l. It grows submersed on stones that may fall dry in summer. The slowly running streams are to 1 dm deep and 1 m wide.

- Discussion

S. cinclidodonteum was described, as *Grimmia cinclidodonte*, by Müller in

1890 from samples growing on wet rocks in Ellensburg, Washington (Röll 1890). It has its main distribution at high altitudes in westernmost North America from California to Washington. It became also known from Morocco (Ros *et al.* 2000) where it was found growing on rocks inside a cave at 2700 m a.s.l. American habitats include rocks along intermittent watercourses at high altitudes (McIntosh 2007).

Our report is the first for the Canary Islands, and Macaronesia. The discovery of *S. cinclidodonteum* in Morocco (Ros *et al.* 2000) and the Canary Islands means a large eastern extension of its range which now has become disjunct trans-Atlantic. Likewise occurred to *S. occidentale* (Casas *et al.* 2001). The report of *S. cinclidodonteum* for Europe in the Flora of North America Vol 27 (McIntosh 2007) is given without a reference to specimens or a note. Since *S. cinclidodonteum* is absent from European lists (Hill *et al.* 2006; Hodgetts 2015) or local floras (Smith 2004; Casas *et al.* 2006; Hallingbäck *et al.* 2006; Meinunger & Schröder 2007), the bare report is in need of evidence.

The Canarian plants deserve a note on their morphology. Diagnostic characters are autoicous sexual state, spores 8-12 µm, stem central strand absent, upper half of lamina 2-3-stratose, leaf apex subulate, nerve thick (in cross section to 10 cells high), aquatic habitat. The plants from Gran Canaria comply to the concept of *S. cinclidodonteum* as conceived by Robinson & Herman (1964), Lawton (1971), Bremer (1980), McIntosh (2007), and Ochyra & Bednarek-Ochyra (2015). Related species are few (Ochyra & Bednarek-Ochyra 2015). *S. occidentale* (E. Lawton) S.P. Churchill, is an American species (Lawton 1967; McIntosh 2007), which has been reported from Spain (Casas *et al.* 2001). It differs in having a 1-stratose lamina for most of its length, and a thin nerve (to 6 cells high in cross section) biconvex near the base. *S. frahmianum* Ochyra & Afonina (2010) differs in having a narrow nerve (45-65 µm near base) and larger spores (12-19 µm).

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